

The Self-care Behaviours and related Acculturation Factors among First- generation Chinese Immigrants Living with Cardiovascular Disease in Australia

by Ling Zeng

Thesis submitted in fulfilment of the requirements for
the degree of

Doctor of Philosophy

Under the supervision of
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Certificate of Original Authorship

I, Ling Zeng, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Nursing and Midwifery, Faculty of Health at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

This research is supported by the Australian Government Research Training Program.

Ling Zeng

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Impact of COVID-19 on Thesis

My registration for this PhD coincided with the outbreak of SARS-CoV2 in January 2020 and the subsequent COVID-19 pandemic has had a cascade effect throughout my PhD study. The timeline for the whole thesis was longer than anticipated due to the challenge imposed by COVID-19 and public health restrictions imposed to manage it.

A mixed methods exploratory sequential design was employed in this study, which started with the phase one qualitative interview study to explore the self-care and acculturation-related factors among first-generation Chinese immigrants with cardiovascular disease in Australia. In phase two, the selected and refined instruments, which were grounded in phase one qualitative findings, were used to further explore or generalise the qualitative findings. This community-based mixed method study was planned to recruit culturally and linguistically diverse patients with heart disease from community settings in two different phases of the study. The initial intention was to recruit predominantly in Chinese community associations.

In phase one, the strategy for recruiting participants from Chinese community associations (from September 2021) was designed to access potential participants in person by joining their community activities or giving a research information presentation. However, to be compliant with the public health orders of the New South Wales Government for the management of the COVID-19 pandemic in June 2021, Chinese community associations cancelled all in person group activities and transitioned to online activities. In response to this, the candidate asked the community managers to circulate electronic recruitment flyers throughout their online channels, including WeChat and Facebook. However, the response was slow and limited, and an adequate sample was not obtained through this method of online recruitment alone. It was not until the government relaxed some of the COVID-19 restrictions and the number of COVID-19 cases in the community decreased (after May 2022) that some Chinese community associations started to hold community activities at sites. It was not until then that the researcher had the chance to meet potential participants in person to introduce the research and offer recruitment. In response to this, additional sites and sources for recruitment were sought, and recruitment targets were eventually achieved. However, this entailed considerable delay.

The COVID-19 pandemic significantly delayed the recruitment of the phase one interview study and consequently delayed the data analysis and survey instrument refinement. Thus, the second phase of recruitment for the survey study started in March 2023.

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Anthology of Publication and Conference Presentation

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Poster: Evaluation of self-care level and related factors among first-generation Chinese Australians with cardiovascular disease: A cross-sectional study

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Poster: The impact of COVID-19 on self-care behaviours among Chinese Australians living with cardiovascular disease: a qualitative descriptive study

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Oral presentation: Exploring the Self-care Behaviours among Elder Chinese Australians Living with Cardiovascular Disease: A Qualitative Enquiry

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List of Abbreviations

ABS	Australian Bureau of Statistics
ACS	Acute coronary syndrome
ARSMA	Acculturation Rating Scale for Mexican Americans
BEFF-HM scale	Bicultural Efficacy in Health Management Scale
CALD	Culturally And Linguistically Diverse
CHD	Coronary heart disease
CR	Cardiac rehabilitation
CVD	Cardiovascular disease
ED	Emergency department
INR	International Normalized Ratio
MESA	Multi-Ethnic Study of Atherosclerosis
NAATI	National Accreditation Authority for Translators and Interpreters
NHMRC	National Health and Medical Research Council
NSQHS	National Safety and Quality Health Service
NSW	New South Wales
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SASH	Short Acculturation Scale for Hispanics
SC-CHDI	Self-care for Coronary Heart Disease Inventory
SEM	Social-ecological model
SL-ASIA scale	Suinn-Lew Asian Self-Identify Acculturation Scale
TCM	Traditional Chinese Medicine
TCM belief	Traditional Chinese Medicine belief scale
WHO	World Health Organization

Glossary of Terms

Acculturation: when groups of individuals with different cultures come into continuous first-hand contact and subsequent changes occur in the original cultural patterns of either or both groups.

Cardiovascular disease (CVD): a range of heart and blood vessel-related problems, including coronary heart disease (heart attack, myocardial infarction and angina), cerebrovascular disease (stroke and transient ischaemic attack), peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary embolism.

Culturally and linguistically diverse (CALD): This term is used in the Australian context to describe people from different cultural backgrounds and/or speak languages other than English.

Cultural assimilation: an individual's response to acculturation where they adopt a new culture and abandon their original culture.

Cultural integration: an individual's response to acculturation where they blend their original culture and new culture together.

Cultural marginalisation: an individual's response to acculturation where they neither endorse their original culture nor accept the new culture.

Cultural separation: an individual's response to acculturation where they preserve their original culture and reject engaging with the new culture.

First-generation immigrants: People who are born overseas (in their country of origin) permanently resettle to a new country. In this thesis, first-generation Chinese immigrants in Australia refer to Chinese people born in Mainland China, Hong Kong, Macao or Taiwan who migrated to Australia.

Mixed-generation immigrants: People with multiple immigrant generations in their family who report more than one ancestry.

Secondary prevention: A disease is detected early and treated before the symptoms present, which avoids the disease deterioration.

Second-generation immigrants: People who were born and living in the host countries with at least one of their parents.

Self-care: The daily activities or behaviours that an individual performs to maintain their health status and prevent disease.

Self-care maintenance: one of the three core components in the model of the Middle-Range Theory of Self-Care of Chronic Illness. It refers to behaviours practised to improve or preserve health status, such as lifestyle modification and medication adherence.

Self-care monitoring: one of the three core components in the model of the Middle-Range Theory of Self-Care of Chronic Illness. It refers to activities taken to monitor the changes of body signs and symptoms regularly, such as checking blood pressure or body weight.

Self-care management: one of the three core components in the model of the Middle-Range Theory of Self-Care of Chronic Illness. It highlights patients' responses to their bodily changes and their evaluation of medication treatment.

Suxiao jiuxin Pill: used for relieving angina, is a type of medicine made from traditional Chinese herbs and processed into pills, tablets, capsules or granules

Thesis Abstract

Background: Evidence-based self-care practices are crucial for better outcomes for people living with cardiovascular disease (CVD), but little is known about the self-care of Chinese immigrants with CVD. The Chinese immigrant population is one of the fast-growing immigrant populations in Western countries, so this is an important omission. This project explores the self-care behaviours among first-generation Chinese immigrants with CVD in Australia and the impact of acculturation on their self-care behaviours.

Method: A mixed methods exploratory sequential design was employed for this study and recruited via Chinese community centres, social media and cardiac clinics. In phase one, a semi-structured interview was used to collect data, which was analysed by thematic data analysis in NVivo version 12. In phase two, a quantitative cross-sectional survey design was employed. Descriptive statistics and multiple linear regression analyses were conducted in SPSS version 26.

Results: In total, 280 participants were recruited in this mixed methods study. Although Chinese immigrants actively engaged in CVD self-care practices, many of these practices had no evidential basis in Western medicine and were not recommended, particularly in response to cardiac events or stroke episodes. Participants who felt confident in their CVD-related health knowledge and searched for Western-resourced health information had significantly better CVD self-care. Many Chinese participants reported low levels of acculturation to Australian culture but perceived high self-efficacy in coping with acculturation stressors such as maintaining family relationships, utilising healthcare services and adapting to new lifestyles in Australia. Their individualised acculturation experiences, particularly in cultural practices, cultural values and utilising the new healthcare system, impacted their CVD self-care behaviours.

Conclusion: Sound knowledge of heart health and self-care management practice are generally lacking among first-generation Chinese Australians, attributed to the lack of access to linguistically and culturally appropriate heart health information. The impact of acculturation experiences on CVD self-care behaviours was shown to be complex and multifaceted. Findings make an important contribution to promote culturally appropriate practice by clinicians and inform the development of culturally and linguistically appropriate health education materials for Chinese immigrants to improve their knowledge and skills of CVD self-care. Partnering with community resources such as Chinese community associations offers an opportunity for co-design and dissemination of information about Australian healthcare systems and CVD health education to upskill CVD self-care practices and mitigate the health inequities experienced by Chinese immigrants in Australia.

Statement on the Format of the Thesis

This thesis was formatted by compilation.

Chapter 1 Study Overview

1.1 Introduction

Cardiovascular disease (CVD) is the leading cause of death globally (World Health Organization, 2021). Migrants relocating to high-income countries (such as those in Europe and North America, and in Australia) are more vulnerable to CVD compared to host populations; there are significant disparities in CVD prevalence and mortality (Agyemang & van den Born, 2022; Agyemang et al., 2024). As one of the largest and fastest-growing ethnic populations in the world (Li et al., 2018), Chinese immigrants have been shown to experience worsened CVD profiles compared to host populations and their counterparts in China (Gong & Zhao, 2016; Jin et al., 2015). With longer residence duration in a host country, Chinese immigrants in Western countries tend to present poorer CVD health and outcomes (Cai et al., 2024; Jin et al., 2017a).

Evidence-based self-care is essential to mitigate CVD symptoms and maintain a good health status (Riegel et al., 2021). Adequate self-care can reduce hospital readmissions and mortality (Riegel et al., 2017). However, the strategies of CVD self-care are complicated and are associated with multiple individual, social and cultural elements (Riegel et al., 2017, 2021). It is especially challenging for immigrant populations with CVD who are confronted with acculturation stress, that is, working between two different cultures and health systems (those of their country of origin and the country of their migration). There is clearly potential for culturally based factors, such as acculturation, to impact CVD self-care behaviours (Osokpo & Riegel, 2021), and this may be particularly pertinent for first-generation Chinese immigrants living in Western countries considering the evident differences between Chinese and Western cultures (Wang et al., 2022).

Understanding CVD self-care and the role of acculturation in self-care practices among Chinese immigrants is crucial for clinical practitioners' cultural sensitivity and humility. This knowledge can help develop linguistically and culturally appropriate self-care interventions essential for improving CVD outcomes and addressing health disparities within this population (Zhang et al., 2025). However, there are substantial gaps in knowledge regarding self-care behaviours and the role that acculturation plays in the self-care of Chinese immigrants living with CVD. Thus, this thesis aimed to address this knowledge gap.

1.2 Background

1.2.1 Cardiovascular disease (CVD)

1.2.1.1 *Physiology of the cardiovascular system*

The cardiovascular system, also referred to as the circulatory system, comprises the heart, arteries, veins and capillaries. The system is responsible for supplying oxygen, nutrients and other substances to the body and removing waste products, which is achieved by the exchanging of these materials between the blood and the body's cells in the capillaries. Specifically, after the heart pumps oxygen-rich blood out, arteries send the oxygenated blood to the body and organs, and take away the waste. Meanwhile, veins return deoxygenated blood to the heart. The cardiovascular system is regulated by a range of stimuli, such as hormones, electrolytes, osmolarity, medications and the parasympathetic and sympathetic nervous systems (Chaudhry et al., 2022).

1.2.1.2 *Pathophysiology of CVD*

CVD refers to a variety of heart and blood vessel problems, including coronary heart disease (heart attack, myocardial infarction and angina), cerebrovascular disease (stroke and transient ischaemic attack), peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary embolism (Yeh et al., 2019). Heart attack and stroke, the major causes of cardiovascular deaths, are predominantly attributed to a build-up of fatty deposits on the inner walls of the blood vessels that block blood from flowing to the heart or brain, or a blood vessel bleeding in the brain (World Health Organization, 2021). The common CVD risk factors are unhealthy diet, physical inactivity, smoking, being overweight, high blood pressure, high fasting glucose and high cholesterol (Shen et al., 2024). CVD is a silent disease, as the disease develops gradually and asymptotically for decades, and the first signs are usually a heart attack or stroke, which most commonly present as chest pain and sudden weakness of the face, arm or leg (World Health Organization, 2021).

1.2.1.3 *CVD prevalence and mortality*

Despite the remarkable advances in CVD diagnosis and treatment, CVD remains a significant threat to global health. Over half a billion people in the world were living with CVD in 2021

(World Heart Federation, 2023). It is the leading cause of mortality globally and accounts for 32% of deaths in the world (World Health Organization, 2021). In Europe, approximately 4.2 million deaths in 2019 were attributed to CVD, which represented 42.5% of all deaths in that region (World Health Organization, 2024a). In the United States of America, data released by the Centers for Disease Control and Prevention (2024) showed that the prevalence of CVD in adults aged over 20 years was 127.9 million in 2020 (Tsao et al., 2023), and 702,880 deaths were CVD-related, which accounts for one in every five deaths in 2022. In Australia, it was estimated that 1.3 million people were diagnosed with CVD in 2022, and 24% of all deaths resulted from CVD (Australian Institution of Health and Welfare, 2024). In China, 330 million people were living with CVD in 2020, and two in every five deaths were due to CVD (The Writing Committee of the Report on Cardiovascular Health and Diseases in China, 2023).

1.2.1.4 Disease burden of CVD

CVD creates an enormous burden on individuals, families and communities. Evidence based on data from global regions showed that CVD death rates were positively associated with out-of-pocket health expenditure (World Heart Federation, 2023). In the United States of America, between 2019 to 2020, US\$252.2 billion was spent on CVD, including healthcare services, medicines and lost productivity attributed to CVD deaths (Centers for Disease Control and Prevention, 2024). In 2020–2021, approximately A\$14.3 billion of expenditure was attributed to CVD in Australia (Australian Institute of Health and Welfare, 2024). In 2023, Australians lost an estimated 666,000 years of healthy life due to all forms of CVD, and 74% of the CVD-related burden was generated from years of life lost to premature death, and 26% of the CVD-related burden was generated from years living with illness and injury (Australian Institute of Health and Welfare, 2024).

1.2.1.5 CVD health and outcomes in immigrant populations

Compared to host populations, many migrant populations are more susceptible to CVD morbidity and mortality, particularly for those living in high-income countries such as those in Europe and North America (Agyemang & van den Born, 2019, 2022). Systematic reviews have shown that most migrant populations in Western Europe presented similar or higher risks of CVD compared to their host populations (Sohail et al., 2015), and the risk was particularly high

among South Asian migrants (Patel et al., 2022; Sohail et al., 2015). For example, in Northern Italy, South Asian migrants had a higher prevalence of ischaemic heart disease and related hospitalisation compared to the host population (Fedeli et al., 2018). In Canada, most immigrants who migrated from low and middle-income countries were at higher risk of CVD-related death compared to the host population (Sebastian et al., 2022). In Australia, a higher prevalence of CVD was identified among Middle Eastern, South Asian and some European immigrant populations (Dassanayake et al., 2009). Immigrants in Western countries were shown to be disproportionately affected by CVD, and this has been attributed to the social and economic status of migrants, problems with access to health care, nutritional supply, neighbourhood environments, health literacy and cultural and language barriers (Agyemang et al., 2024; Cai et al., 2024).

1.2.2 Chinese immigrants

Chinese immigrants are one of the largest and fastest-growing immigrant groups (Gong & Zhao, 2016). Western countries with a substantial influx of Chinese immigrants include the United States of America, Canada, Australia, New Zealand and the United Kingdom (Li et al., 2018). Chinese immigrants were the largest immigrant group from a single Asian country of origin in the United States of America in 2021 (United States Census Bureau, 2023). In 2021, 1.7 million people reported migrating from Mainland China, Hong Kong, Taiwan and Macao to Canada, which constitutes one of the largest visible Asian minority populations in Canada (Statistics Canada, 2024). In Australia, Chinese immigrants were the second-largest overseas-born population in 2023–2024 (Australian Bureau of Statistics, 2024a).

As early as 1828, Chinese migration emerged in colonised Australia due to labour shortages, and immigration numbers gradually increased as migrants came to work in the goldfields after the discovery of gold in Australia in 1851 (Museums of History New South Wales, 2024). After the gold rush, the Australian Government issued the *Immigration Restrictions Act 1901* to curb the increase of Chinese immigrants. This restrictive migration policy restricted immigration from non-European countries up to its abolition in the 1970s, after which Chinese people started to arrive in Australia for business as economic migrants (Jones, 2005). Following the ‘reform and opening’ of China in the 1980s, there was a large influx of Chinese overseas students to Australia (Australian Bureau of Statistics, 2018). With the rapid growth in the number of skilled and family migrants, immigrants born in China became the second-largest source of the increase in

Australia's population between 2013 to 2023 (Australian Bureau of Statistics, 2023). In recent years, many older Chinese immigrants have moved to Australia through sponsorship of their adult children, who arrived first (Zeng et al., 2024).

According to the recent census report (Australian Bureau of Statistics, 2024b), the median age of Chinese immigrants in Australia was 39 years old in 2023, and of these, 55.6% were female. The most popular destinations for Chinese immigrants to reside in Australia were New South Wales (NSW) and Victoria, with 45.0% and 31.0%, respectively, of the total Chinese immigrant population in 2021. Moreover, the largest proportion of overseas-born residents in NSW were Chinese immigrants. Among older people aged 65 and over living in NSW, China was ranked the second most common country of birth (Transcultural Mental Health Centre, 2022).

According to data released by the Australian Bureau of Statistics (2021), in Greater Sydney, the mean age of Chinese immigrants was 43 years old, and 55.9% of this population were female. Overall, 62.4% of Chinese immigrants living in Greater Sydney were married, and 47.8% had a Bachelor's degree or above. Nearly one-third of this population reported speaking English not well or not at all. In total, 51.6% of this population group worked full-time, and the top three occupations included professionals, managers and clerical and administrative workers. While 79.5% Chinese immigrants denied having chronic health conditions, 13.9% were living with at least one chronic disease (Australian Bureau of Statistics, 2021). Suburbs in Sydney with relatively high density Chinese immigrant populations include Hurstville, Eastwood, Zetland, Ultimo, Burwood, Rhodes, Chatswood, Chippendale, Carlingford and Epping (Robertson et al., 2022).

1.2.3 CVD profile of Chinese immigrants

It has been widely reported that Chinese immigrants living in Western countries experience disadvantageous CVD profiles. Compared to host populations in Canada, the Netherlands, Scotland and the United States of America, Chinese immigrants had higher short-term mortality after a diagnosis of CVD, as shown in a systematic review and meta-analysis of eight cohort studies following participants for 2–20 years (Jin et al., 2015). Another systematic review revealed that Chinese immigrants had a higher risk of stroke than the Swedish host population (Sohail et al., 2015). Chinese immigrants in New York City were observed to have a higher mortality rate from haemorrhagic stroke compared to the American host population (Agyemang et al., 2024; Fang et al., 1999).

Chinese immigrants have been shown to have higher rates of CVD mortality and morbidity than comparable non-immigrant populations. Compared to people in Mainland China, Chinese populations in Western Europe and North America had higher rates of hypertension, diabetes, hypercholesterolemia and obesity (Chiu et al., 2010). Results from a systematic review including 16 papers with 258,474 Chinese participants revealed that Chinese immigrants in Western developed countries, including the United States of America, Canada and the United Kingdom, had lower rates of stroke prevalence and mortality but higher rates of CHD than their counterparts in Mainland China (Gong & Zhao, 2016).

Further, a range of cohort studies have provided evidence that the CVD profile of Chinese immigrants adversely changed with residence duration in Western countries. For example, Chinese immigrants who lived longer in Italy tended to have a higher risk of hypertension and diabetes (Modesti et al., 2021). The incidence of major cardiovascular events among Chinese immigrants also increased with a longer duration of stay in Canada (Tu et al., 2015). A cohort study with a median follow-up of 17.8 years showed that a longer duration of residence in the United States of America was associated with an increased risk of CVD mortality among Chinese immigrants (Cai et al., 2024).

In Australia, a large national cohort study of 266,696 Australian participants found that, compared to non-Chinese Australians, Chinese immigrants had a lower prevalence of CVD but a higher prevalence of CVD risk factors, such as diabetes, smoking and physical inactivity (Jin et al., 2017b). Further, Chinese immigrants who lived in Australia longer were more susceptible to diabetes and the development of more than three CVD risk factors (Jin et al., 2017a). In the Greater Sydney area, Chinese immigrants had a higher prevalence of diabetes ($n = 11,876, 5.0\%$) than the population born in Australia ($n = 95,317, 3.2\%$), while the prevalences of heart disease and stroke ($n = 6,421$ and 2.7%; $n = 1,634$ and 0.7%, respectively) among Chinese immigrants were similar to that of the population born in Australia ($n = 91,526, 3.1\%$; $n = 19,938, 0.7\%$) (Australian Bureau of Statistics, 2021).

1.2.4 Self-care behaviours

1.2.4.1 *The concept of self-care*

The term self-care is employed interchangeably with self-management in some literature but for consistency the term self-care is used in this thesis. Self-care is an umbrella term which encompasses the daily activities or behaviours an individual performs to maintain their health

status and prevent disease (World Health Organization, 2024c). These health-related behaviours are particularly important for people living with chronic disease (Allegrante et al., 2019; Clark et al., 1991). Self-care is a multidimensional process that demonstrates people's behaviours in maintaining health, preventing and managing disease throughout the life course (Riegel & Jaarsma, 2021; Riegel et al., 2012). Within Western healthcare paradigms, evidence-based self-care behaviours for secondary prevention and management of cardiovascular disease include, but are not limited to: adhering to prescribed cardiac medications, attending cardiologist appointments, following heart-healthy diets, maintaining exercise routines, quitting smoking, monitoring medication side effects and body signs, detecting cardiac symptoms and responding appropriately, and consulting their General Practitioners and cardiologists (National Heart Foundation of Australia, 2023). Patients can utilise allied healthcare services to reduce their lifestyle-related CVD risk factors. For example, dietitians can assist with recommendations for menus to align with heart-healthy eating patterns, physiotherapists can support the development of exercise routines to control hypertension, diabetes and hyperlipidaemia. smoking cessation and alcohol helpline services can aid with quitting smoking and reducing alcohol intake (Riegel et al., 2017; National Heart Foundation of Australia, 2023).

By contrast, in China, CVD secondary prevention and management heavily rely on pharmacological therapy prescribed by cardiologists or Traditional Chinese Medicine practitioners, while lifestyle interventions are underemphasised. Following CVD diagnosis or hospital discharge, patients are instructed to take cardiac medication regularly and attend cardiologist follow-ups. Cardiac doctors or nurses may provide generic health education on heart-healthy lifestyles, such as reducing fatty and salty foods, and increasing exercise. No professional allied healthcare services are available for referral (Wu et al., 2024). Some patients see Traditional Chinese Medicine practitioners and take their prescribed medications, while they perceive Western cardiac medications as their first-line medication for CVD management (Jin et al, 2020).

To specify the core components of self-care, Riegel, Jaarsma, & Strömborg (2012) developed the middle-range Theory of Self-Care of Chronic Illness, which evolved from caring for clinical patients with heart failure. In this model, self-care encompasses three core processes: self-care maintenance, self-care monitoring and self-care management. Self-care maintenance is defined as behaviours practised to improve or preserve health statuses, such as lifestyle modification and medication adherence. Self-care monitoring refers to activities taken to observe body symptoms regularly, such as checking blood pressure or blood glucose. Self-care management

emphasises patients' evaluation of their treatment, which impacts their treatment compliance and adherence (Riegel et al., 2012).

Evidence-based self-care is strongly recommended by national guidelines, systematic reviews and scientific statements focusing on the prevention and management of CVD (Heidenreich et al., 2022; Kleindorfer et al., 2021; Osokpo & Riegel, 2021; Riegel et al., 2017; Virani et al., 2023; Vrints et al., 2024). Of these guidelines and the evidence from research, similar or common self-care activities of CVD patients were summarised by Riegel et al. (2017) in line with the key elements of the Theory of Self-care of Chronic Illness. These are: self-care maintenance activities, which includes maintaining a healthy diet, physical activity, reducing alcohol use, quitting smoking, gaining disease-related knowledge, adhering to prescribed medications and attending medical appointments; CVD-related self-care monitoring, which refers to acknowledging the common disease-related signs and symptoms (such as angina, heart attack or stroke), and routine body signs measurement (for example blood pressure, blood sugar and body weight); and self-care management, which requires people to distinguish cardiovascular symptoms from non-life-threatening conditions, to have a plan to respond to these symptoms (such as taking or adjusting medication and calling for health service support) and to further evaluate the effectiveness of treatment (Osokpo & Riegel, 2021; Riegel et al., 2017).

The underlying process of performing self-care behaviours is decision-making. For the Theory of Self-care for Chronic Illness, naturalistic decision-making has been used to explain individuals' self-care behaviours for managing chronic illness (Riegel et al., 2012). In real-world situations embracing uncertainty, ambiguity, limited time and resources, individuals use their personal experiences and values to make decisions, which leads to the actions taken for performing self-care behaviours (Riegel et al., 2012, 2017). Thus, it is insightful for clinicians to understand the decision-making process underpinning their self-care behaviours to provide acceptable self-care education.

1.2.4.2 Self-care and CVD outcomes

Self-care has been shown to play a profound role in the prevention and management of CVD (Riegel et al., 2021). According to research findings (Riegel et al., 2017), for patients with CVD, the time spent with healthcare providers averages about 10 hours per year, which indicates that most of the care patients undertake for their disease occurs outside healthcare settings. Competent and adequate self-care practices, including the use of evidence-based strategies, can

improve CVD outcomes. It is well known that self-care can improve clinical CVD outcomes with lower cardiac mortality and hospital readmissions and result in fewer nonfatal myocardial infarctions (Janssen et al., 2013; Riegel et al., 2017). Results from a systematic review with a meta-analysis involving 20 randomised trials of 5624 participants indicated that the self-care interventions of patients with heart failure reduced all deaths and improved 12-month quality of life (Jonkman et al., 2016). Similarly, strong evidence from several systematic reviews with meta-analyses supported the finding that self-care improves the quality of life of stroke survivors and reduces post-stroke deaths (Parke et al., 2015; Riegel et al., 2017).

1.2.4.3 Factors impacting self-care

The complexities of self-care practices challenge patients living with chronic diseases and undermine their appreciation by healthcare professionals and health system policy-makers (Riegel et al., 2017). To effectively perform adequate self-care, people need to be equipped with evidence-based disease-related knowledge and skills, motivation and self-efficacy. However, self-care behaviours are embedded in every aspect of daily life, and are inevitably influenced by a variety of individual-level, family-level and community-level factors (Riegel et al., 2012). Specifically for people living with CVD, individual factors impeding CVD self-care can include but are not limited to disease-related health literacy, illness experiences, personal habits, motivation and confidence in performing self-care practices, comorbidities and mental status (Riegel et al., 2012; Riegel et al., 2017). Social support from family and social networks plays a significant role in making disease-related decisions, providing health information, supervising treatment adherence and encouraging CVD self-care engagement (Babygeetha & Devineni, 2024; Riegel et al., 2017; Tang et al., 2023). Moreover, a body of evidence showed that people who received more social support had a lower risk of CVD morbidity and mortality (Riegel et al., 2017). Regarding the community-level factors, the availability and accessibility of evidence-based health information, community resources (food quality, transportation, a safe neighbourhood environment and healthcare services in community settings) are critical elements to enable people to engage in CVD self-care (Riegel et al., 2012, 2017).

1.2.4.4 The role of culture in self-care

Culture refers to shared values, social norms, beliefs and social behaviours that are passed from generation to generation among a group of people (Al-Bannay et al., 2014). Culture permeates every aspect of life and shapes individual illness perspectives, health beliefs and the development of personal lifestyle practices and habits such as dietary preferences and exercise routines (Riegel et al., 2012, 2021). These aspects can influence how people interpret and perceive a disease diagnosis, respond to treatment plans and modify their lifestyles to manage disease conditions, which can further affect their engagement in self-care (Arnault, 2018). Findings from a systematic review shed light on the impact of culture on self-care behaviours among immigrant populations living with CVD (Osokpo & Riegel, 2021). For example, cultural beliefs such as fatalism, collectivism, social norms and traditional gender roles were reported as conflicting with healthy dietary adjustment, medication adherence and the use of alternative medicine, and they impacted the interpretation and response to CVD symptoms in African American and South Asian populations (Osokpo & Riegel, 2021).

Chinese immigrants in Australia must understand the cultural differences between the traditional culture of their country of origin and the Western culture in their host country, specifically the cultural beliefs and lifestyle practices that can influence their self-care behaviours (King-Shier et al., 2018; Osokpo & Riegel, 2021). It is well known that Chinese immigrants also face systematic and societal conditions that influence their self-care behaviours, such as difficulties in utilising healthcare services and accessing mainstream health information due to language and cultural barriers (Aparício et al., 2023; Chao et al., 2020; Qian & Mao, 2021; L. Zhang et al., 2023).

1.2.5 Acculturation

1.2.5.1 The concept of acculturation

Acculturation was first defined in 1936 by Redfield, Linton and Herskovits as the phenomena that occur when groups of individuals with different cultures come into continuous first-hand contact; acculturation is the resulting changes in the original cultural patterns of either or both groups (Robert et al., 1936). Since 1936, the dynamic, changing processes of acculturation have been variously investigated by sociologists and cultural anthropologists in line with their disciplines and research purposes. Over time, the emphasis has shifted from group-level phenomena to individual experiences (Fox et al., 2017a). In recent years, the most widely used

framework of acculturation has become that proposed by psychologist John Berry to identify the components of acculturation (Lee et al., 2013; Thomson & Hoffman-Goetz, 2009).

In Berry's model, contact between cultural groups results in a variety of adaptation forms characterised by cultural and psychological changes. Individuals' preferences for certain attitudes and behaviours result in four different acculturation strategies: integration, assimilation, separation and marginalisation (Berry, 2019). Integration refers to individuals blending their original culture and new culture together, assimilation is adopting a new culture and abandoning the original culture, separation is holding on to the original culture and being reluctant to engage in a new culture, and marginalisation is neither maintaining the original culture (due to forced cultural loss) nor accepting a new culture, as a result of, for example, discrimination (Berry, 2019; Lee et al., 2013; Thomson & Hoffman-Goetz, 2009).

1.2.5.2 Chinese culture and acculturation stress in Australia

When Chinese populations migrate to Australia, they may encounter cultural differences and related acculturation stress. Firstly, whilst English is the spoken language in Australia, the common languages spoken among Chinese immigrants are Mandarin or Cantonese. The consequent inability to understand the spoken and written language of the country contributes significantly to acculturation stress, affecting not only interpersonal communication but also access to public information and resources in Australia. This is particularly a problem for elderly Chinese immigrants who rarely have the opportunity to learn to speak and understand the English language in China (Chun et al, 2011). Another potential source of stress derives from food and dietary practices. Chinese dietary practices differ from Western-style habits, encompassing food ingredients, cooking styles, and taste preferences. For example, rice is the dietary staple in China but even though this is readily available in Australia, the type of rice may differ from that which is familiar to Chinese immigrants. However, the ethnic diversity of the Australian population means that other stable foods often predominate. For some Australians, potatoes provide the main carbohydrate, but for the majority of diets this function is served by wheat, for example, through breads, pastries, pies and pastas. Salty, spicy and pickled food, common in Chinese menus, features less amongst many Western diets. These differences may be particularly challenging in Chinese dietary culture where food plays an important role in disease prevention and health maintenance (Osokpo and Riegel, 2019). These differences can expose

Chinese immigrants to diet-related acculturation stress, where they may have to adapt what they purchase, prepare and cook as well as consume.

More broadly, Chinese culture is characterised by collectivism, which means that group benefits are prioritised over individual needs (Osokpo and Riegel, 2021). Parents may sacrifice their own health to cook meals not meeting heart-healthy recommendations for their family who may prefer Western-style food with higher levels of salt and oil. Also, the importance accorded to filial piety is grounded in Chinese traditional culture which values respect and love for parents, elders and ancestors (Chun et al, 2011). Generally, adult children are expected to fulfill their social obligation to take good care of their ageing parents. This can be eroded by the individualism featured in Australian society, where independence and self-reliance is emphasized. This may further undermine family relationships, resulting in acculturation stress.

1.2.5.3 Acculturation and immigrants' health

Acculturation is described as playing a significant role in the health of migrant populations and is of interest to many researchers in public health who aim to minimise health disparities among minority groups (Fox et al., 2017a; Thomson & Hoffman-Goetz, 2009). The dynamic process of cultural interaction permeates every facet of immigrants' daily activities and lifestyles via attitudes, cultural beliefs and behaviours that shape patterns of immigrants' health status and disease risk. As a result, increasing numbers of studies have focused on the association between acculturation and health behaviours or outcomes among migrant populations (Alidu & Grunfeld, 2018; Fox et al., 2017b; Osibogun et al., 2021). Robust evidence has indicated that immigrant groups with higher levels of acculturation to host countries were more susceptible to obesity (Alidu & Grunfeld, 2018; Jin et al., 2017a), diabetes (Jin et al., 2017a; Venkatesh et al., 2017) and drinking behaviours (Lui & Zamboanga, 2018). Another review including 35 papers with sample sizes from 152 to 126,796 participants found that immigrants with shorter residence duration, as a proxy acculturation measure, reported better health behaviours than their host populations (Alidu & Grunfeld, 2018). Conversely, a systematic review revealed that Asian and Hispanic immigrants with a higher level of acculturation measured by English proficiency and ethnic identity tended to report better self-rated health status (Lommel & Chen, 2016).

1.2.5.4 Acculturation and CVD health

The course of acculturation can significantly affect cardiovascular health (Dafoe & Wong, 2018). Epidemiologically, levels of acculturation have been closely associated with CVD subclinical and risk factor profiles (Cai et al., 2024; Jin et al., 2017a). For example, the Multi-Ethnic Study of Atherosclerosis demonstrated that greater acculturation was related to increased left ventricular mass index (Effoe et al., 2015) and poor CVD risk factors such as obesity, diabetes and hypertension (Osibogun et al., 2021). Among Chinese immigrants, according to large cohort studies, increased acculturation over time has been accompanied by an increase in body mass index (Chen et al., 2012; Jin et al., 2017b), insulin resistance (Modesti et al., 2021; Morey et al., 2023; Tseng & Fang, 2015), high blood pressure (Modesti et al., 2022) and higher risk of CVD mortality (Cai et al., 2024). Chinese immigrants in Australia with greater acculturation were more likely to report obesity and diabetes (Jin et al., 2017b)

1.2.5.5 Acculturation and self-care behaviours

Robust evidence has indicated that levels of acculturation can be closely related to disease self-care behaviours among immigrant populations (Jin et al., 2017b; Modesti et al., 2022; Vo et al., 2024). For example, acculturation to the host culture was positively related to the self-management practices of older Turkish immigrants living in the Netherlands (Cramm & Nieboer, 2019). Older Moroccan immigrants with lower acculturation to Dutch culture tended to have poorer self-care of their well-being (Hussein et al., 2024). Acculturation accounted for the variance in heart failure-related self-care behaviours among Portuguese immigrants (Sethares & Westlake, 2023). Chinese immigrants in Australia with higher levels of acculturation to their adopted country had better diabetes medication adherence (Eh et al., 2016). This has been at least partially explained by the various levels of acculturation influencing immigrants' health behaviours and experiences of navigating their new health systems and their variable success in utilising health services (Dafoe & Wong, 2018).

1.2.5.6 Acculturation measurements

The accuracy of the various acculturation measures has been controversial, possibly due to the complex nature of the construct. Four types of acculturation measurement tools have been commonly employed in existing health research, including proxy acculturation measures,

unidimensional acculturation measures, bi-dimensional acculturation measures and multidimensional acculturation measures (Fox et al., 2017a; Thomson & Hoffman-Goetz, 2009).

Proxy acculturation measures can be nativity (first or later generation status), age at migration, length of residence and language spoken at home (Diez Roux et al., 2005; Jin et al., 2017a; Thomson & Hoffman-Goetz, 2009). Proxy acculturation measures have been widely used to examine the association between acculturation and CVD risk factors in epidemiology studies (Effoe et al., 2015; Lutsey et al., 2008; Moran et al., 2007; Morey et al., 2023; Namratha et al., 2008). Although it is convenient to collect and analyse proxy data in quantitative studies, proxy acculturation measures fail to reflect the complicated and multidimensional transitions of acculturation related to attitude and behaviour changes (Berry, 2019; Thomson & Hoffman-Goetz, 2009).

Uni-dimensional instruments represent a linear change process in one direction from losing one's original culture to adopting a new culture in a host country (Thomson & Hoffman-Goetz, 2009). One example of a uni-dimensional scale is the Short Acculturation Scale for Hispanics (SASH) (Eh et al., 2016; Marin et al., 1987), which is a single measure assessing three acculturation domains: language use, media and ethnic social relations by a Likert-type scale ranging from 'very Hispanic' to 'very American' (Salant & Lauderdale, 2003). However, this scale fails to consider that immigrants can retain their heritage culture and simultaneously integrate the new culture in the host country depending on how much they need to change cultural values, attitudes, practices and identifications (Berry, 2019; Schwartz et al., 2010).

Bi-dimensional instruments apply two separate instruments to measure the level of retained culture from the original country and that of the adopted culture of the immigration country. An example of this is the Bi-dimensional Acculturation Scale for Hispanics (Marin & Gamba, 1996; Perez et al., 2017). This measure consists of domains examining linguistic proficiency, language and media use in acculturation; two scales independently assess adherence to Hispanic culture and adaptation to American culture (Perez et al., 2017).

Multidimensional instruments assess the acculturative process from multiple perspectives and separately examine attitudes, values and ethnic interaction via separate scales to comprehensively grasp the individual's acculturation experience (Hsueh et al., 2015). An example includes the Acculturation Rating Scale for Mexican Americans (ARSMA) II (Gutierrez et al., 2009) and the Suinn-Lew Asian Self-Identify Acculturation Scale (SL-ASIA scale) (Suinn et al., 1992). The original 21-item multiple choice SL-ASIA scale questionnaire assesses acculturation

in five elements: language use or preference, ethnic social interaction, affinity for ethnic identity and pride, generational identity and food preference (Suinn et al., 1992).

In general, bi-dimensional and multidimensional scales are regarded as better options for capturing more detailed and accurate information regarding the relationship between acculturation and health compared to proxy measures and uni-dimensional scales (Fox et al., 2017a). However, the main body of conceptual and theoretical studies of acculturation and migrant health has predominantly derived from Hispanic immigrant populations in America, which limits the relevance and applicability of work and measures to other migrant groups (Salant & Lauderdale, 2003). For Asian immigrant populations, the most commonly employed measurement of acculturation in health research has been the SL-ASIA scale (Hsueh et al., 2015; S. Lee et al., 2017; Salant & Lauderdale, 2003), which is reported to better capture the multidimensional aspects of acculturation, to be more user-friendly for Asian immigrant populations and to possess good psychometric properties (Hsueh et al., 2015; Ponterotto et al., 1998).

1.3 Gaps in the literature

Several gaps were identified in the relevant literature. First, the current literature on self-care behaviours and related cultural factors among Chinese immigrant population is scarce (Jin et al., 2020; Osokpo & Riegel, 2021; Zhang et al., 2018), and there are very few studies addressing the impact of dynamic acculturation processes on CVD self-care behaviours among this population. Second, the existing literature on CVD among Chinese immigrants living in Western countries is inconsistent; studies are dated and fail to consider the impact of changing migration structures, acculturative transitions and changes in the public health literacy of recent immigrants. Third, these studies mainly report aggregated data on CVD risk in primary prevention and merge Chinese immigrants with other immigrant populations into a broader pan-Asian ethnicity (Zeng et al., 2023; Zheng et al., 2019). Fourth, most studies focusing on CVD secondary prevention fail to distinguish between first-generation Chinese immigrants and second or mixed generations, whose self-care practices may vary significantly depending on the level of acculturation (Bainey et al., 2018; Davidson et al., 2011; Khan et al., 2017; Yeung et al., 2013). Thus, data on self-care behaviours after a CVD diagnosis and the impact of acculturation among first-generation Chinese immigrants are scarce, which suggests that the topic may not be well understood.

1.4 Study significance

Evidence has demonstrated that culturally tailored self-care interventions, such as patient education, can improve self-care behaviours and disease outcomes among immigrant populations living with CVD (Zhang et al., 2025). A better understanding of the impact of acculturation is required to accurately describe and interpret self-care behaviours in CVD secondary prevention among Chinese immigrants living with CVD in an intercultural context. This is required to fill the gap identified in the literature and provide evidence to inform the development of culturally tailored self-care intervention and patient education to promote better CVD outcomes among this population.

This research is needed to provide evidence that can be used to improve clinical practitioners' cultural sensitivity: to avoid stereotyping of Chinese patients living with CVD and contribute to culturally appropriate practices. As health practitioners have insights into the various acculturative transitions that people undergo (Berry, 2019), they can provide individualised self-care intervention programs based on their clinical assessment, which will lead to better self-care practices and disease outcomes. The results will also provide evidence for policymakers to help them develop culturally appropriate resources and services to minimise CVD health disparities.

1.5 Study aims and research questions

The overarching aims of this study were to explore the self-care behaviours of Chinese immigrants living with CVD in Australia and investigate the impact of acculturation experiences on their CVD-related self-care behaviours. The following questions were asked for this research project:

1. What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, and symptom monitoring and responses?
2. What factors impact the CVD self-care behaviours of Chinese Australians?
3. What are their acculturation experiences in terms of cultural practices, cultural values and beliefs and cultural identification?
4. How do Chinese Australians' unique acculturation experiences impact their self-care practices for CVD?

1.6 Study objectives

To meet the study aims, the following study objectives were proposed:

1. To conduct preliminary individual interviews in a qualitative study (phase one) and survey participants in a quantitative study (phase two) to demonstrate the self-care behaviours among Chinese Australians living with CVD .
2. To conduct preliminary individual interviews in a qualitative study (phase one) and survey participants in a quantitative study (phase two) to identify factors impacting their CVD self-care behaviours .
3. To conduct preliminary individual interviews in a qualitative study (phase one) and survey participants in a quantitative study (phase two) to describe the acculturation experiences of Chinese Australians living with CVD .
4. To conduct preliminary individual interviews in a qualitative study (phase one) and survey participants in a quantitative study (phase two) to investigate the impact of acculturation on self-care behaviours reported among Chinese Australians living with CVD .

1.7 The researcher's motivation

Initially, my motivation for this research project stemmed from my personal experiences rather than academic literature. First, I have a strong interest in CVD prevention and management because this disease runs in my family, which initially drove me to dig deeper into this disease. Second, CVD is a silent killer, but it is preventable, and its progress can be slowed by early screening and lifestyle-related interventions. As a nurse, it is rewarding to educate people on CVD-related knowledge and self-care skills to adopt a heart-healthy lifestyle and engage in medical treatments, as it can help them manage CVD risk factors and improve their CVD health and outcomes.

Third, after acquiring a Bachelor's degree in nursing in China and completing my new graduate program in a stroke medical unit, I came to Australia to study a Master's of Nursing degree by coursework at the University of Sydney. These experiences inspired me to think about the differences in nursing care between Australia and China. When I took my clinical placements and later worked as a registered nurse in Australia, I came across Chinese patients who were struggling to go between Australian and Chinese health systems, which resulted in poor therapeutic rapport and undesired disease outcomes due to language barriers and cultural variations. I felt I would like to devote myself wholeheartedly to helping these Chinese

immigrants take better care of themselves and better manage their illnesses within the intercultural context. All these experiences paved the way to start this PhD project coupled with the strong support from my parents.

During stage one of my PhD candidature, I immersed myself in the literature on this topic, from scoping literature searches to a systematic literature review and found that data on self-care behaviours and related cultural factors among first-generation Chinese immigrants diagnosed with CVD were scarce. I recognised that this population was not well studied. Undoubtedly, this further consolidated my motivation to conduct the research and pursue my PhD to help more Chinese immigrants living with CVD.

In this research, as a bilingual researcher, I shared the same language and cultural health beliefs and practices with the participants, which facilitated data collection. Firstly, the shared language and culture could generate a sense of familiarity and approachability, which to some extent reduced the potential power imbalance between researcher and participant and encouraged participant disclosure. Secondly, I was able to recognise and appreciate cultural nuances, implied meanings and ethical considerations as they arose in the data. As a consequence, better accuracy of data collection likely supported generation of more reliable and valid research results.

My nursing background, including CVD clinical experience both in China and Australia, prepared me to recognise valuable insights into the therapeutic differences in the management of CVD in China and Australia. For example, in Australia, lifestyle modification (regarded as non-pharmaceutical intervention) is perceived as possibly equally important as pharmaceutical treatment for CVD secondary prevention and management. Allied healthcare services are well-established to assist patients to adapt to heart healthy lifestyles and specifically reduce CVD risk factors. By comparison, in China, lifestyle adjustment is understated and there is limited access to evidence-based health education resources. The use of and access to Traditional Chinese Medicine for CVD management has prevailed in China. This background understanding was helpful in designing the interview questions to comprehensively explore participants' CVD self-care behaviours. Following a general question asking how participants look after their heart disease after CVD discharge or diagnosis, probes were added for lifestyle changes, access to CVD health education and the use of Traditional Chinese Medicine to gain more detailed and culturally relevant information from participants.

Although I am an immigrant from China and migrated to Australia at a relatively young age compared to these participants, my acculturation experiences in language, dietary practice and access to the healthcare system resonated with that of participants, which paved the way to build rapport with participants, uncover detailed information and accurately interpret the research results. Specifically, I recognised how difficult it may be for older immigrants to adapt to healthcare providers' health education, for example on western-style dietary practices, without consideration of the cultural ramifications and implications of this for these immigrants. I was able to empathise with participants finding difficulties in accessing the healthcare system in Australia, where a General Practitioner's referral is required to visit a specialist or be admitted to a hospital. These shared migration experiences enabled me to better understand the concept of acculturation, leading to more nuanced and meaningful findings.

To avoid research bias, I had no prior contact with any participant before the research project. I paid attention to ensure I maintained non-judgmental attitudes during data collection; rather than giving personal comments and suggestions on participants' responses, open-ended questions were used to encourage participants to share their experiences or views freely, and used pre-designed interview probes to seek more details. I strived to maintain an open mind and actively listened to participants' accounts of their individual experiences meanwhile remaining aware but not influenced by any prior assumptions on each topic. Being mindful that non-verbal communication (such as facial expressions and tone of voice) could potentially impact data collection, I sought to present neutrality throughout data collection. For data analysis, I interpreted the data literally by offering a straightforward description from participants' perspectives and avoiding interpretation ingrained with any personal beliefs and values.

1.8 Outline of the thesis

Chapter 1 Study Overview

This chapter has provided background information related to this research project, from the general introduction of the research topic to specific definitions of key elements (the introduction of CVD, Chinese immigrants' demography, CVD's profile in Chinese immigrant populations, concepts of self-care and acculturation) in line with the research questions. The

study aims and objectives have been presented following the description of the literature gap and study significance.

Chapter 2 Literature Review

Prior to undertaking this study, it was important to discover what was already known about this topic and what was not known; to determine what methods had previously been used successfully to obtain this information. An initial literature review was therefore undertaken, aiming to demonstrate the self-care behaviours of first-generation Chinese immigrants with cardiovascular disease in Western countries and to identify related cultural factors. The target population for the review (first-generation Chinese immigrants with cardiovascular disease in Western countries) was deliberately broader than that of the planned thesis studies (first-generation Chinese immigrants with cardiovascular disease in Australia) to ensure no relevant material was missed. The results from this integrative literature review informed the planning and preparation process for the thesis study.

In summary, this chapter demonstrated the current state of knowledge on self-care behaviours and related cultural factors among Chinese immigrants with CVD in Western countries, identified the paucity of information and gaps in the literature and informed the development of research questions, aims and objectives and research methods of this thesis.

Chapter 3 Research Methods

This chapter describes the rationale and processes of the methodologies and methods used in this research project, including the phase one qualitative study using interviews and the phase two quantitative study that employed a survey design. This chapter sets out the study aims, study design and methods with ethical considerations.

Chapter 4 Phase One Qualitative Results: Self-care Behaviours, Perceived Barriers and Enablers

This chapter uses the format of a published paper to present partial findings of the phase one qualitative study that used interviews to provide insight into the self-care behaviours performed by first-generation Chinese immigrants living with CVD in Australia and explore factors perceived as barriers and facilitators to their self-care. These data qualitatively addressed research questions 1 and 2 (Table 1-1).

Chapter 5 Phase Two Quantitative Results: Self-care Behaviours and Related Factors

This chapter presents partial findings from the phase two quantitative study, which used a survey design to assess the self-care performed by first-generation Chinese immigrants living with CVD and to identify factors associated with their CVD self-care behaviours. These data quantitatively addressed research questions 1 and 2 (Table 1-1).

Chapter 6 Phase One Qualitative Results: Acculturation Experiences and Impact on Self-care

This chapter uses the format of a published paper to present partial findings of the phase one qualitative study that used interviews to describe the acculturation experienced by Chinese immigrants with CVD in Australia and how these acculturation experiences influenced their CVD self-care behaviours. These data qualitatively addressed research questions 3 and 4 (Table 1-1).

Chapter 7 Phase Two Quantitative Results: Acculturation Experiences and Related Self-care

This chapter presents partial findings of the phase two quantitative survey study examining the acculturation experiences among first-generation Chinese immigrants living with CVD and the association with their CVD self-care behaviours. These data quantitatively addressed research questions 3 and 4 (Table 1-1).

Chapter 8 Integration of Findings and Discussion

This chapter synthesises the findings generated from the phase one qualitative data and phase two quantitative data to address research questions 1, 2, 3 and 4. This chapter then discusses these key synthesised findings with reference to the wider literature. Study strengths and limitations are considered (Table 1-1).

Chapter 9 Implications and Conclusion

This chapter offers recommendations for clinical practice and policy, health education and future research and concludes the whole thesis.

Table 1-1 Research findings navigation table

Study sequence	Research questions and findings	Chapter
Phase one qualitative study	Findings address research question 1: <i>CVD self-care behaviours</i>	4
	Findings address research question 2: <i>Factors impacting CVD self-care behaviours</i>	4
	Findings address research question 3: <i>Acculturation experiences</i>	6
	Findings address research question 4: <i>The impact of acculturation on CVD self-care behaviours</i>	6
Phase two quantitative study	Findings address research question 1: <i>CVD self-care behaviours</i>	5
	Findings address research question 2: <i>Factors impacting CVD self-care behaviours</i>	5
	Findings address research question 3: <i>Acculturation experiences</i>	7
	Findings address research question 4: <i>The impact of acculturation on CVD self-care behaviours</i>	7
Data integration	Findings address research question 1: <i>CVD self-care behaviours</i>	8
	Findings address research question 2: <i>Factors impacting CVD self-care behaviours</i>	8
	Findings address research question 3: <i>Acculturation experiences</i>	8
	Findings address research question 4: <i>The impact of acculturation on CVD self-care behaviours</i>	8

Chapter 2 Literature Review

2.1 Chapter introduction

The purpose of the literature review was to gain a new understanding of the existing research pertinent to this research topic. The literature review results were intended to identify any gaps in the literature and inform the research questions, aims and objectives.

This chapter is based on an integrative review which was published in the *Journal of Clinical Nursing* in 2023. The content of this paper has been reproduced in this chapter with the publisher's permission (see Appendix 1), and the published text can be viewed in Appendix 1. The paper is referenced as follows:

Zeng, L., Perry, L. & Xu, X. (2023). Self-care behaviours and related cultural factors among Chinese immigrants with cardiovascular disease in western countries: An integrative review. *Journal of Clinical Nursing*, 32(9–10), 1599–1614.
<https://doi.org/10.1111/jocn.16120>

To maintain the currency of the literature review, the literature searches were repeated to identify any papers published from 04/06/2020 to 17/10/2024 (after the integrative review was completed and accepted for publication), as the last search pre-publication was conducted on 03/06/2020. One additional paper was identified and included in the following chapter along with the published review paper.

2.2 Abstract

Aims and objectives: This review aimed to demonstrate the self-care behaviours of first-generation Chinese immigrants with cardiovascular disease in Western countries and identify related cultural factors.

Background: Self-care is the cornerstone to mitigate disease symptoms and maintain health status. Chinese immigrants to Western countries, operating within a cross-cultural context, may find self-care to manage their cardiovascular disease challenging.

Design: An integrative review was conducted.

Methods: Seven databases were searched: Scopus, ProQuest Health & Medicine, Medline (Ovid), Embase (Ovid), AMED (Ovid), PsycINFO and CINAHL, with output limited to peer-reviewed studies published from January 2000 to December 2024 in English or Chinese. Initially, 2673 papers were screened. Seven papers were retained and critiqued using the Joanna Briggs Institute critical appraisal tools. Deductive and inductive approaches were utilised to analyse the findings. The PRISMA 2020 checklist informed review reportage.

Result: In general, Chinese immigrants with cardiovascular disease took an active role in the management of their cardiovascular disease, including through diet and activity adaptation and adherence to Western medication. Families also played a significant role in disease decision-making and management. However, language and cultural barriers impeded their access to health information and resources in host countries.

Relevance to clinical practice: Understanding self-care behaviours and associated cultural factors among Chinese immigrants with cardiovascular disease is important to improve nurses' culturally sensitive practices and provide tailored health education interventions to promote self-care behaviours among immigrant populations. The scarcity of literature on self-care behaviours among Chinese first-generation immigrants with cardiovascular disease indicates the need for further research in this area. Development of culturally and linguistically sensitive health resources and education programs is urgently needed.

Keywords

Self-care; self-management; secondary prevention; health behaviours; cardiovascular diseases; Chinese immigrants; cultural factors

What does this paper contribute to the wider global clinical community?

- The scarcity of literature on self-care behaviours among Chinese first-generation immigrants with cardiovascular disease indicates the need for further research in this area.
- In general, Chinese immigrants with cardiovascular disease took an active role in the management of their cardiovascular disease, with families also playing a significant role in disease decision-making and management. Thus, family as well as patient involvement in self-care education is important.
- Culturally and linguistically sensitive health resources and education programs are urgently needed.

2.3 Introduction

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality globally (World Health Organization, 2021) and a major issue among many immigrant ethnic groups (Agyemang et al., 2012). Evidence-based self-management or self-care is the cornerstone of mitigating CVD symptoms and maintaining health status (Riegel et al., 2017). However, the nature of CVD self-care is complicated and associated with a myriad of individual, social and cultural elements (Riegel et al., 2017). This is particularly the case for immigrant populations with CVD operating within a cross-cultural context.

Chinese immigrants are one of the largest and fastest-growing ethnic populations in the world. The most popular Western countries to which Chinese populations migrate are the United States of America, Canada, Australia, New Zealand, and the United Kingdom (Department of Economic and Social Affairs, 2019; Gong & Zhao, 2016; Jin et al., 2015). It has been widely reported that Chinese immigrants experience disadvantageous CVD profiles, with increased CVD risk factors, higher CVD prevalence and poor disease outcomes(Gong & Zhao, 2016; Jin et al., 2015, 2017b). For example, considering CVD risk factors, Chinese immigrants have a higher prevalence of diabetes and greater physical inactivity than white populations. Longer duration of residence in Western countries has been significantly associated with higher risk of diabetes and demonstration of more than three risk factors(Jin et al., 2017a). A systematic review including 16 papers with 258,474 Chinese participants revealed that Chinese immigrants' prevalence and mortality from coronary heart disease was higher than that of the comparable population of mainland Chinese people (Gong & Zhao, 2016). Another systematic review and meta-analysis of eight cohort studies with 2-20 years follow-up found Chinese immigrants had higher short-term mortality after a diagnosis of CVD than white populations (Jin et al., 2015). Therefore, it is important to consider how Chinese immigrants manage their CVD in Western countries.

Self-management is an umbrella term which involves a series of daily activities or behaviours that an individual performs to maintain or improve their health status (Clark et al., 1991). The term self-management is employed interchangeably with self-care in some literature but for consistency, self-care is used in this review. In 2012, Riegel, Jaarsma, and Strömberg developed the Middle-Range Theory of Self-Care of Chronic Illness, which has been widely cited in self-care research. Grounded on Dorothea Orem's theory of self-care (Orem et al., 2001, p. 143), Riegel's model specifies three core concepts in self-care behaviours: self-care maintenance, self-care monitoring and self-care management (Attaallah et al., 2021; Riegel et al., 2012). Self-care maintenance refers to the behaviours practiced to preserve health status, such as lifestyle

modification and medication adherence, which is mostly what is investigated in current self-care literature (Riegel & Jaarsma, 2021). It is well known that self-care can improve clinical outcomes with lower cardiac mortality and hospital readmissions as well as nonfatal myocardial infarctions (Janssen et al., 2013; Riegel et al., 2017). However, the complexities of self-care practices challenge patients (Riegel et al., 2017).

Self-care behaviours are embedded in every aspect of daily life, associated with a range of factors including patients' experience and skill, motivation, cultural traditions, daily routines or habits, social support and access to care (Jaarsma et al., 2020; Riegel et al., 2012). Accordingly, it can be particularly difficult for Chinese immigrants who also need to work between two cultures, negotiating differences between Eastern and Western forms of knowledge, health beliefs, practices and systems. In Western Europe, Chinese immigrants have been reported with poor CVD risk factor management, with an increased prevalence of nonfatal myocardial infarction (Chiu et al., 2010). Cultural factors have been widely reported as determinants of CVD self-care behaviours among Chinese immigrants, and described as related to language barriers, different cultural beliefs, family support and healthcare systems (Jin et al., 2020; King-Shier et al., 2018; King et al., 2007; Osokpo & Riegel, 2021; Wang & Matthews, 2010).

A better understanding of self-care behaviours and related cultural factors is important to improve nurses' culturally sensitive practices and develop culturally appropriate health education programs and services to improve Chinese immigrants' self-care skills for CVD and to minimize cardiovascular health disparities. However, literature on this topic among Chinese immigrants is scarce (Jin et al., 2020; Osokpo & Riegel, 2021; Zhang et al., 2018). Studies mainly report aggregated data on CVD risk in primary prevention and collate Chinese immigrants within a broad pan-Asian ethnicity (Zheng et al., 2019). Additionally, most studies focusing on CVD secondary prevention fail to distinguish Chinese first-generation immigrants (those born in the country of origin who migrate to a host country) from second-generations (the children of first-generation migrants, born in the host country) or Chinese populations of mixed ethnic backgrounds, whose self-care practices may all vary significantly depending on the level of acculturation (Bainey et al., 2018; Khan et al., 2017). Therefore, this review aimed to address the gap in knowledge by demonstrating the self-care behaviours and related cultural factors reported among first-generation Chinese immigrants with CVD in Western countries.

2.4 Methods

Given the multiple different approaches potentially used by literature on this topic, the methodology of an integrative review was chosen to allow the combination of differing types of data on CVD self-care behaviours among Chinese immigrants. The integrative review process proposed by Whittemore and Knafl (2005) was utilised, involving: 1) problem identification; 2) literature search; 3) data evaluation; 4) data analysis; and 5) presentation. The review was registered in PROSPERO with registration number: CRD42020214634. The systematic process of the review was reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist (Page et al., 2021) (see Appendix 2).

2.4.1 Problem identification

The problem that the review sought to address was the gap in knowledge set out in the following review questions:

- 1) What self-care behaviours are used by Chinese immigrants with CVD living in Western countries?
- 2) What cultural factors have been related to these self-care behaviours?

2.4.2 Literature search

Literature search strategies

After identifying the review questions, a comprehensive computer-assisted search strategy was developed by combining key terms (Table 2-1). With the assistance of a librarian, a proximity search strategy was employed to render the search more specific. Seven databases were targeted for searching: Scopus, ProQuest Health & Medicine, Medline (Ovid), Embase (Ovid), AMED (Ovid), PsycINFO and CINAHL, with output limited to peer-reviewed studies published from 2000.01 to 2024.10 in English or Chinese (see Appendix 3). The search terms expressed three concepts pertinent to the review aims, including key terms or synonyms from other review studies (Hooper et al., 2018; Zhang et al., 2018). Reference lists of included studies and literature reviews as well as some relevant studies from an ancestry search were also searched to maximize the number of eligible primary sources and reduce the search bias.

Endnote X9 was employed to manage and screen the search output. Following the removal of duplicates, an initial screening of the title and abstract was undertaken to exclude studies irrelevant to the review aims. The full text of the remaining studies was read for eligibility in accordance with inclusion and exclusion criteria. The final included papers were screened by two researchers independently for rigour using the software package Covidence. Where there was disagreement, this was discussed by three researchers until a consensus was reached.

Table 2-1 Search terms

Concept 1	Concept 2	Concept 3
Chinese immigrants	AND cardiovascular disease	AND Disease self-care behaviours
chin* W/4 (immigr* OR ethnic* OR cald OR migr*)	cardio* OR cardia* OR "heart failure" OR heart* OR coronary* OR angina* OR myocard* OR isch?em* OR stroke OR strokes OR poststroke OR post-stroke OR cerebrovasc* OR "cerebral vascular" OR brain* OR infarct*	experienc* OR prevent* OR manag* OR self-management OR behav* OR adjust* OR rehab* OR care*OR self-care OR diet* OR exercis* OR "physical activit*" OR medication OR health-seeking OR care-seeking OR seek*OR respon* OR lifestyle* OR life-style*

Selection criteria

Inclusion criteria:

- Peer-reviewed full-text report of primary research.
- Participants were Chinese first-generation immigrants to Western countries.
- Participants had self-reported or medically diagnosed coronary heart disease, stroke or heart failure.
- The paper reports self-care behaviours, such as diet, physical activities, medication adherence or health-seeking behaviours.

In this review, the term Chinese first-generation immigrants refers to Chinese people from and born in Mainland China, Hong Kong, Macao or Taiwan who migrated to Western countries such as America, Canada, the UK, Australia, New Zealand and European countries (Zhang et al., 2018). Based on the World Health Organization (2021) definition, this study mainly focused on coronary heart disease, stroke and heart failure. Self-care behaviours were defined in line with Osokpoe

and Riegel's (2021) systematic review where the most common elements of self-care were listed as diet, exercise, medication adherence and health-seeking behaviours.

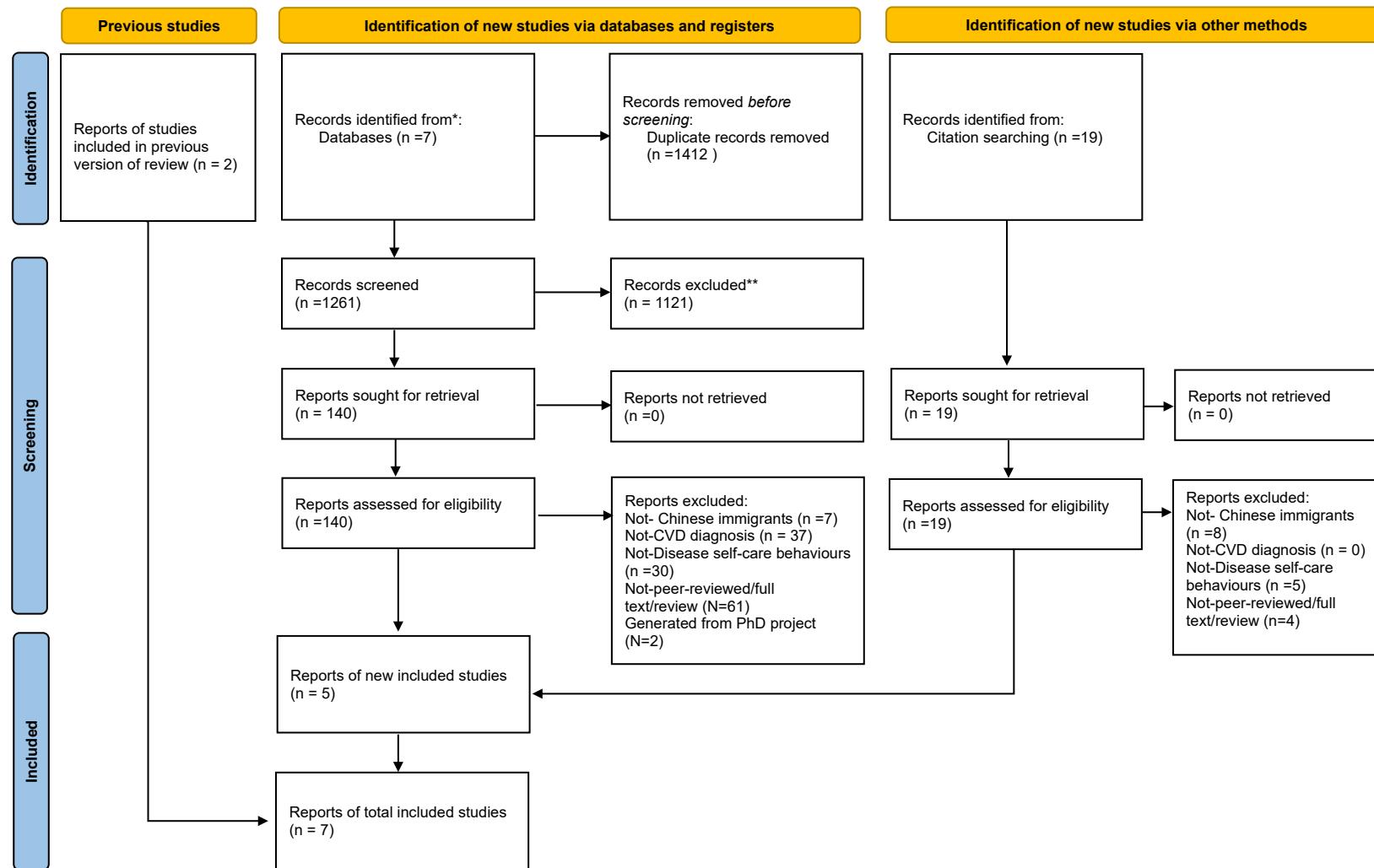
Exclusion criteria:

Studies were excluded if they investigated second-generation or mixed-ethnicity Chinese immigrants. "Second-generation immigrants" are people born and living in the host (immigrant) countries (such as the UK, and Australia) with at least one of their parents born overseas (for example, in China) (Afable-Munsuz et al., 2010); "Mixed Chinese" were people reported with both Chinese and other ancestries (Jin et al., 2017b). This review focused on secondary prevention and management of CVD, and excluded papers solely focused on CVD primary prevention (addressing, for example, hypertension and diabetes) (World Health Organization, 2021). Papers targeting smoking and alcohol drinking behaviours were excluded as these characteristics are not commonly included within the definition of cardiovascular disease self-care (Osokpo & Riegel, 2021). Papers only reporting medical management (such as medication prescription) rather than patient self-care behaviours (e.g. medication adherence) were also excluded.

Two papers generated from this PhD project (see Chapters 4 and 6) were excluded from this review analysis. One potential study (Speed et al., 2021) published in 2021 explored the health-seeking behaviours in accessing primary care services among older Chinese immigrants with CVD in the UK. This focus group study recruited 28 participants diagnosed with CVD or risk factors for CVD (hypertension or high cholesterol). However, the study failed to describe the number of Chinese immigrants diagnosed with CVD, which was one of the inclusion criteria of the integrative review. The researcher contacted the corresponding author for clarification but received no reply. Thus, the paper was excluded.

In summary, from the initial search output of 2673 papers in seven databases, seven papers were included for the analysis. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses PRISMA 2020 flowchart (Page et al., 2021) (Figure 2-1) indicates papers at each stage of review.

Figure 2-1 PRISMA 2020 flow chart for updated systematic reviews which included searches of databases, registers and other sources



2.4.3 Data evaluation

The Joanna Briggs Institute (JBI) critical appraisal tools (Barker et al., 2024; Lockwood et al., 2020; Moola et al., 2020) were employed to critique included studies, targeting the methodological quality of each study by assessing the possible biases of each research design, conduct and analysis.

Following discussion and selection of the most appropriate JBI appraisal tool in line with the study design or methodology, one researcher assessed the study quality and a second researcher independently scored the study. If there were discrepancies, this was discussed and agreed. No cut-off point was applied for rating the study quality, and the quality score was not an inclusion criterion in this review (Table 2-2). Three qualitative studies scored highly, indicating high methodological quality, while four quantitative studies achieved over half of the maximum score.

2.4.4 Data analysis

Following the process set out by Whittemore and Knafl (2005), essential data were extracted from included studies. One researcher extracted the data, which were checked independently by one of the two other authors for accuracy and rigour. The extracted data were tabulated to assemble the primary study data in line with two review questions. A combination of deductive and inductive approaches was utilised to analyse and synthesize the findings (Younas et al., 2022).

To address the first review question, an initial subgroup classification was set up (Whittemore & Knafl, 2005; Younas et al., 2022), based on the preconceived main elements of CVD self-care behaviours as reported by Osokpo and Riegel (2021). Additional characteristics were sought emerging from the findings of included studies. During the re-reading process, relevant data were grouped and entered into the concept matrix under the subgroup classifications (see Appendix 4). For the concept matrix, the quantitative numerical data were interpreted and transformed into textual data. For example, the reported p-values of the extracted data from quantitative studies were rendered into textual data as “significant” or “not significant” in relation to key finding statements. Data were categorised and synthesized, using constant comparison across studies to seek patterns of similarity and difference. Findings were then synthesized narratively to draw conclusions to answer the first review question.

Table 2-2 Critical appraisal of included studies

JBI critical appraisal tool for qualitative studies			
	Jin et al. 2020	King et al. 2007	King-Shier et al. 2017
1 The philosophical perspective and the research methodology are congruous	NA	+	NA
2 The research methodology and the research question or objectives are congruous	+	+	+
3. The research methodology and the methods used to collect data are congruous	+	+	+
4. The research methodology and the representation and analysis of data is congruous	+	+	+
5. The research methodology and the interpretation of results are congruous	+	+	+
6. A statement for locating the researcher culturally or theoretically is provided	+	+	+
7. The influence of the researcher on the research and vice-versa is addressed	+	+	+
8. Participants and their voices are represented adequately	+	+	+
9. Research ethical according to current criteria or for recent studies is approved	+	+	+
10. The conclusion in the research report flow from the analysis is drawn	+	+	+
Total score	9	10	9

JBI critical appraisal tool for analytical cross-sectional studies			
	Fredericks 2012	King-Shier et al. 2018	King-Shier et al. 2019
1 The criteria for inclusion in the sample is clearly defined	+	+	+
2 The study subjects and the setting are detailed	+	+	+
3. The exposure is measured in a valid and reliable way	-	-	-
4. Objective, standard criteria are used for measurement of the condition	+	+	+
5. Confounding factors are listed	+	+	+
6. Strategies are used to deal with confounding factors	-	-	+
7. The outcomes are measured in a valid and reliable way	+	+	+
8. The statistical analysis is appropriate	+	+	+
Total score	6	6	7

JBI critical appraisal tool for quasi-experimental studies

	Shi et al. 2024
1. The “cause” and what is the “effect” are clear	+
2. The control group is clearly described	+
3. Participants included in any comparisons are similar	+
4. Participants included in comparisons received similar treatment, other than the intervention of interest	+
5. Multiple measurements of the outcome were conducted both pre and post intervention	+
6. The outcomes of participants in the comparison group were measured in the same way	+
7. The outcomes were measured in a reliable method	+
8. The follow-up was complete	+
9. The statistical analysis was appropriate	+
Total score	8

NA = not applicable *+= Yes* *- = No*

For the second review question, a comprehensive definition of cultural factors developed for use in health practice settings was used, including the country of origin, languages spoken, family roles, gender roles and culture-related lifestyle practices (Purnell, 2018, pp. 61–71). Relevant data were extracted into a second data extraction table. Additional culturally based factors were grouped under the theme of other cultural factors. The grouped data were charted in the second concept matrix (see Appendix 5) related to the impact of cultural factors on self-care behaviours. Using the same approach as for the first review question, the data were grouped under subthemes, compared and synthesized to draw conclusions to address the second review question.

During the data analysis, the researcher re-read the included papers and took notes to create an audit trail for potential interpretational and synthesis bias. Potential biases were discussed among the three authors. The researcher repeatedly checked the final synthesized results to ensure that no key findings were missed.

2.5 Results

2.5.1 Study and participant characteristics

Seven studies were included in this review (Table 2-3). Four papers utilised quantitative methods, while three employed qualitative methods including grounded theory and descriptive qualitative approaches. Five studies were conducted in Canada (Fredericks, 2012; King-Shier et al., 2017, 2018, 2019), and two in Australia (Jin et al., 2020; Shi et al., 2024). Four studies focused on multi-ethnicity comparisons. Study objectives varied from a single focus, such as cardiac medication adherence and time to emergency department response to chest pain, to broader general self-care behaviours.

The sample size of the seven included papers ranged from 9 to 216 participants per study. The average age of the sampled Chinese informants was over 63 years, and the proportion of males ranged from 54.4% to 81.3%, except that one study (Fredericks, 2012) did not provide age or gender data. These participants were predominantly recruited, and data were collected in a hospital setting, with two undertaken in the community.

Table 2-3 Data extraction table

Author/Year Country	Study design	Research Aim	Participants	Data collection/analysis	Measurement tool	Main findings
Quantitative study data from interviews/questionnaires/medical records						
Shi et al., 2024 Australia	A prospective pre-post study	To evaluate a self-administered digital education resource for patients after a heart attack on secondary prevention knowledge and health behaviour change outcomes.	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> (i) Chinese immigrants residing in Australia; (ii) had a diagnosis of percutaneous coronary intervention (PCI) and/or coronary artery bypass graft surgery (CABG) and were eligible for attending cardiac rehabilitation programmes; (iii) available for the four weeks of the study. <p>Participant number: 64 patients completed the study. They were recruited from cardiac rehabilitation programmes at four metropolitan tertiary hospitals in Sydney</p> <p>Chinese Characteristics: The mean age was 67.2 years, 81.3% males, most married lived with family or caregivers, had tertiary or above education level (73.4%), 71.9% unemployed or retired</p>	<p>All participants received a website link via text message or email from nurses at the recruitment site, including instructions on access to the resource package and completing the surveys. For the pre-intervention assessment, participants were given a survey package with a link sent by email (REDCap survey links)</p> <p>In SPSS, descriptive statistics were used to describe the clinical variables. Paired t-tests or chi-square were used to assess improvement pre and post-intervention. The level of significance was set at 0.05 for all tests.</p>	<p>The validated Coronary Artery Disease Self-management Scale in Chinese was used to assess the self-care behaviours;</p> <p>Physical activity was assessed by asking for the average minutes of moderate-intensity exercises per week and completing a 9-day step count log to calculate the average daily steps.</p> <p>Dietary behaviour was asked about the average servings of fruit and vegetables per day.</p>	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • The Coronary Artery Disease Self-management score was 38.25 ± 6.06 pre intervention. <p>Physical activity:</p> <ul style="list-style-type: none"> • The average minutes of moderate-intensity exercise per week was 89 ± 126. • 17.19% patients achieved the recommendation (at least 150mins per week). • The daily step count was 4848 ± 3289. <p>Heart-healthy diet</p> <ul style="list-style-type: none"> • The daily consumption of fruit and vegetables was 2.86 ± 1.03 servings. <p>Cultural factors: None</p>
Qualitative study data from interviews/questionnaires/medical records						
Fredericks, 2012 Canada	A descriptive non-experimental study	To determine whether an individual's country of origin influenced performance of self-care behaviours after heart surgery.	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Underwent coronary artery bypass graft and/or valvular replacement. • Spoke English. • Oriented to time, place, and 	<p>Demographic information was collected within 24–48 hours of admission to the cardiovascular surgery units by asking patients face-to-face.</p>	<p>Revised Self-Care Behaviour Scale with higher scores indicating more frequent performance of self-care behaviours.</p>	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • No statistically significant relationships were noted between China and the performance of self-care behaviours: $rpb(89)=-0.068$, $P=0.27$. <p>Cultural factors:</p>

Author/Year Country	Study design	Research Aim	Participants	Data collection/analysis	Measurement tool	Main findings
			<p>person.</p> <ul style="list-style-type: none"> Had access to a working phone at home. <p>Participant number: A convenience sample of 90 patients (Chinese 11.1%)</p> <p>Chinese Characteristics: No indication of a demographic profile</p>	<p>Data related to self-care behaviours performance were collected at 1 week post-hospital discharge by telephone interview.</p> <p>Point-biserial correlation used for data analysis.</p>		None
King-shier et al., 2018 Canada	A quantitative survey study	To generate an in-depth understanding of the decision-making process and potential ethno-cultural differences, of White, Chinese, and South Asian cardiac patients when deciding to adhere to a medication regimen.	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> Selected from a cohort study of ACS patients. Additional Chinese participants were sought from a Chinese senior's cultural centre, with a physician diagnosed with heart disease and prescribed more than two medications for heart disease. Self-reported ethnicity as one of South Asian, Chinese, or European (White) and ability to speak English. Spoke in Cantonese or Mandarin; or Punjabi or Hindi. <p>Participant number: 286 participants including 79 Chinese</p>	<p>The surveys were undertaken by telephone by trained research assistants, or in person via interview.</p> <p>Collecting a demographic survey, ANOVA or Chi-square for data analysis.</p> <p>For the medication adherence survey, Chi-squared tests or Fisher's exact tests were used.</p>	<p>Gladwin's ethnographic decision-tree modelling approach (stage 1 via interview, stage 2,3 via survey). This study focused on stage 3.</p> <p>Stage 3 survey was based on the results of stage 1 qualitative review and stage 2 pilot testing.</p> <p>Participants were asked to self-report adherence behaviour in the survey: "consistently," "sometimes" or "not at all" adherent to their cardiac medications.</p>	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> Self-reported medication adherence: 77.2% (n=61) consistently taking medication, and 22.8% (n=18) sometimes taking medications. The medication adherence was significantly associated with medication affordability ($P=0.011$), challenges in remembering to take medication ($P<0.001$), doubt about the need to take medication ($p<0.001$), making own decision on which medications to take ($P=0.027$). Compared to whites (100%) or South Asians (94.9%), Chinese were least likely to continue to consult with doctors about medications (93%, $p=0.047$). <p>Cultural factors:</p> <ul style="list-style-type: none"> The belief that the need to take the prescribed medication was significantly associated with medication adherence ($P<0.001$). Self-decision on which medication to take was significantly associated with medication adherence ($P=0.029$).

Author/Year Country	Study design	Research Aim	Participants	Data collection/analysis	Measurement tool	Main findings
King-Shier et al., 2019 Canada	A cross-sectional survey	To examine potential ethnic variations in ACS symptoms and clinical care outcomes in white, South Asian, and Chinese patients.	<p>Chinese Characteristics: Male 54.4% Mean age (SD):73.99 (10.46)</p> <p>Inclusion criteria: <ul style="list-style-type: none"> • Age >19 years. • Admission to hospital with a confirmed diagnosis of ACS. • Self-reported ethnicity for either white (European), South Asian or Chinese. • Speaking English, Punjabi, Tamil, Urdu, Hindi or Gujarati, Cantonese or Mandarin. </p> <p>Participant number: 1334 patients including 216 Chinese.</p> <p>Chinese Characteristics: Mean age (SD):65.1 (12.6); Male 154 (71.3%).</p>	<p>A health record audit was undertaken to collect additional demographic and clinical data like time to ED presentation, once the participant had been discharged from hospital.</p>	A health record audit	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • Regarding any mid-sternal pain/discomfort: Mean time (SD) to ED presentation among Chinese with typical and atypical symptoms were: 5.92hours (5.49) and 7.41 hours (6.10), p=0.176. While whites were 6.43 hours (5.77), 6.11 hours (5.53), P=0.591; South Asians were 5.69 hours (5.35), 7.17 hours (5.94), P= 0.037. • Regarding any mid-sternal with left neck, shoulder, or arm pain/discomfort: Meantime (SD) to ED presentation among Chinese with typical and atypical symptoms were: 6.0 hours (5.65), 6.31 hours (5.62), p=0.726; While white were 6.41 hours (5.82), 6.31 hours (5.57), P=0.836; South Asian were 5.53 hours (5.35), 6.42 hours (5.60), P=0.092. <p>Cultural factors:</p> <ul style="list-style-type: none"> • Ethnicity is related to the time presenting to ED, although the difference is little.
Jin et al., 2020 Australia	A descriptive Qualitative study	To investigate multilevel and interactive elements of individual, family, institutional, community, and policy factors that influence engagement with	Inclusion criteria: <ul style="list-style-type: none"> • Chinese immigrants born in China, including Hong Kong. • Experienced a CHD diagnosis or event in the previous 6-months. • Eligible to attend CR. 	Recruitment from two publicly funded, tertiary hospitals in New South Wales, participants were approached by CR coordinators.	The SEM framework	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • One patient with known CHD presented immediately to ED for Chest pain. • All patients moved to a healthier diet with reducing salt, fat, higher glycaemic carbohydrate and sugar after diagnosis, with family support. • Most participants sought CHD health information

Author/Year Country	Study design	Research Aim	Participants	Data collection/analysis	Measurement tool	Main findings
		CHD primary and secondary prevention among Chinese immigrants and their family carers using a social-ecological model lens.	<ul style="list-style-type: none"> Carer participants were a close family member of a patient. <p>Participant number: Sample (9 patients, 9 carers):</p> <ul style="list-style-type: none"> 12 CHD patient journeys (a narrative about a CHD experience provided by either a patient and their carer). 6 dyads where the patient and carer were related. <p>Chinese Characteristics: Patient participants: median age 70 (55-82) Female: male (3:6).</p>	<p>A single, semi-structured interview using an interview guide was conducted.</p> <p>Code analysis considered under the framing of the SEM categories to provide a socioecological explanation for health understandings and behaviours.</p>		<p>and emotional support from family and friends who were in China, and from the media or websites in Chinese language from China, reporting the difficulties in finding culturally appropriate health education and engaging with mainstream health care resources (No indication of primary or secondary prevention, but one listed example with known heart disease).</p> <ul style="list-style-type: none"> Of 12 patient journeys, 3 attended CR. Most participants did not know the program, nor were invited to. Most participants intentionally sought Chinese-speaking doctors. (No indication of primary or secondary prevention). All participants preferred Western-trained doctors and Western treatment, particularly for acute conditions. Most participants used some form (Chinese herbs or acupuncture) for their general health but continued to take prescribed medication. They did not discuss TCM consumption with physicians who may consider drug interaction. (No indication of primary or secondary prevention). <p>Cultural factor:</p> <ul style="list-style-type: none"> Language barriers: one participant changed to different cardiologists and preferred a Chinese-speaking specialist. For most participants, the lack of culturally and linguistically specific health information and programs resulted in difficulty in accessing mainstream healthcare and seeking health information in Chinese web/media. (No indication of primary or secondary prevention). Family support: family made suggestions on reducing salt, fat, higher glycaemic carbohydrates, sugar within the Asian diet context, influencing all participants moving to a healthier diet. Family

Author/Year Country	Study design	Research Aim	Participants	Data collection/analysis	Measurement tool	Main findings
King et al., 2007 Canada	A grounded theory	To describe and explain the influence of Chinese ethno-cultural affiliation and gender on the process that Chinese cardiac patients undergo when faced with making behaviour changes associated with reducing their CVD risk.	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Volunteers who immigrated from mainland China as adults were recruited • Participants identified themselves as having CVD and facing or had faced making lifestyle adjustments to manage their health risk. • Primary informants who remained highly affiliated with their own culture. • Secondary informants who had undergone some acculturation to the larger community. <p>Participant number:</p>	<p>Informants were recruited into the study via the Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease database, a Chinese seniors group, numerous Chinese churches, and word of mouth.</p> <p>Semi-structured interviews</p> <p>Constant comparative methods</p>	<p>Themes:</p> <p>Intrapersonal factor, Interpersonal factor, Extrapersonal factor, Sociodemographic factors</p>	<p>helped participants to access medical appointments, some related to filial duty between children and grandchildren (no indication of primary or secondary prevention). All participants used family as interpreters in health settings (no indication of primary or secondary prevention).</p> <ul style="list-style-type: none"> • Social network with country of origin: most participants sought health information from it. • Ethnic concordance between doctors and patients: most sought Chinese-spoken doctors. • TCM use: as a second-line treatment, western medication was more efficient. Some with mixed belief on TCM used it for general health. They did not discuss TCM consumption with physicians who may consider drug interaction. (No indication of primary or secondary prevention) <p>Self-care behaviours:</p> <ul style="list-style-type: none"> • At early stage following CVD diagnosis, participants were decisive and resolute, quickly moving to seek health care and manage risk. They preferred Chinese physicians who understood better. • One decided to change eating habits straightforwardly after diagnosis. • Many adjusted medications based on their belief and symptom experience. • TCM was used for chronic disease rather than heart disease considered as an acute condition. • Some sought only Western health care as believed it was best. • Some blended Western approaches with TCM. One drank herbal teas regularly. • Some gave up TCM as a side-effect and unaffordable price.

Author/Year Country	Study design	Research Aim	Participants	Data collection/analysis	Measurement tool	Main findings
			<p>Chinese immigrants (10 men, 5 women)</p> <p>Chinese Characteristics: Mean age for female (74.2), male (68.3)</p>		<ul style="list-style-type: none"> Many participants more often ate traditional Chinese meals at home as believed healthier. A few ate until 70% to 80% full to reduce food intake and manage weight. Physically active: many walked, Tai Chi, and swam regularly. Majority were active and diligent in seeking the best healthcare and resources. Diligent attending physician appointments and meeting multidisciplinary health providers. Most attended CR programs. <p>Cultural factor:</p> <ul style="list-style-type: none"> Realization that one cannot go back: participants quickly and actively sought health care rather than dwelling on receiving their CVD diagnosis. Believing Chinese doctors for better understanding: they preferred Chinese doctors. Keeping peace in life and having faith (Confucian or Christian): participants used for their heart disease management. Beliefs in taking control of their destiny: many participants adjusted their own medications. TCM used for chronic disease rather than heart disease: participants sought only Western medication; some blended two approaches. One drank herbal tea to digest greasy meals. One participant gave up TCM as a drug interaction. Beliefs in home-made Chinese meals (less meat more vegetables) healthier: many preferred to eat at home frequently. Believing that eating is not for satiety: participants controlled their meals and managed weight. 	

Author/Year Country	Study design	Research Aim	Participants	Data collection/analysis	Measurement tool	Main findings
King-Shier. K.M, et al., 2017 Canada	A qualitative descriptive study	To develop an in-depth understanding of factors that influence cardiac medication adherence among South Asian, Chinese, and European White cardiac patients	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Adult (>18 years) patients admitted to hospital with confirmed ACS. • Self-reported ethnicity as one of South Asian, Chinese, or European (White). • Spoke in Punjabi, Tamil, Urdu, Hindi, Gujarati, Cantonese, Mandarin, or English. <p>Participant number: 64 patients (25 South Asian, 13 Chinese, and 26 European White ACS patients) sampled</p> <p>Chinese Characteristics: Mean age: 63 Male (8) and female (5)</p>	<p>Draw on a multi-provincial, multi-ethnic cohort of ACS patients who had agreed to be contacted in the study.</p> <p>The interviews were conducted over the telephone.</p> <p>Using conventional content analysis</p> <p>Data were collected using semi-structured interviews.</p>	<p>The interview guide was based on Spradley's ethnographic interviewing techniques using "grand tour" and "mini tour" questions.</p>	<ul style="list-style-type: none"> • Family support: male participants were supported by wife as supervisors, organizers or cooks in terms of CVD management. Female participants were supported by children. Extended family supported some participants in health behaviour changes, such as listening to family's advice. Family helped manage health care information (attending appointments, CR) as an interpreter. <p>Self-care behaviours:</p> <ul style="list-style-type: none"> • Having variable adherence to cardiac medications, influenced by communication with physicians and motivating factors. • Medication adherence was motivated by accepting it as a fact of life, relieving symptoms or controlling disease, preventing problems, having a routine, affordable medication, and consulting with physicians on the management of side effects. • One occasionally added TCM to medication regime as poorly controlled angina. <p>Cultural factor:</p> <ul style="list-style-type: none"> • Clear, direct communication pattern with physicians; Being able to communicate one's own language and understand own "way". • To accept it as a factor of life: it facilitated medication adherence. • A healthy life was more important than a long life: it motivated one participant's medication adherence. • TCM used for poor symptom control.

Note: *rpb* = Point-biserial correlation; *ACS* = acute coronary syndrome; *ED* = emergency department; *CHD* = coronary heart disease; *CR* = cardiac rehabilitation; *SEM* = social-ecological model; *TCM* = Traditional Chinese Medicine

2.5.2 Review question 1: Self-care behaviours

Six papers included data that addressed the first review question regarding self-care behaviours among Chinese immigrants living with CVD (Jin et al., 2020; King-Shier et al., 2017, 2018, 2019; King et al., 2007; Shi et al., 2024). For general self-care behaviours, one paper (Shi et al., 2024) using the Coronary Artery Disease Self-Management Scale found that the overall self-care behaviours among Chinese participants with CVD were inadequate, with a score of 38.5 out of 60 (the cut-off point for adequate self-care was set at 70). For specific self-care behaviours, all data were related to the four subgroups of dietary adjustment, physical activity, medication adherence and health-seeking behaviours; no other specific self-care behaviours were reported.

2.5.2.1 *Dietary adjustment*

Changing daily dietary habits in line with recommendations that have been established for CVD health is an essential element of self-care behaviours after a CVD diagnosis. Two qualitative studies explored the Chinese participants' dietary adjustments. These Chinese immigrants actively modified their diets following their CVD diagnosis. One qualitative study (Jin et al., 2020) reported all participants in the study changed to a healthier diet by reducing salt, fat, higher glycaemic index carbohydrates and sugar after their CVD diagnosis. In another study (King et al., 2007) one participant was reported as making a decision to adjust his diet pattern straight away when he was told of the CVD diagnosis. Many participants chose to eat home-made traditional Chinese meals more frequently, explained as comprised of "little meat with a lot of vegetables" (King et al., 2007, p. 816). To avoid overeating and maintain weight, a few Chinese participants (King et al., 2007) controlled what they ate, eating until they felt 70 to 80 percent full. However, one quantitative study (Shi et al., 2024) specifically investigated that the average daily consumption of fruit and vegetables among this population was 2.86 servings per day, which was much lower than the recommended amount.

2.5.2.2 *Physical activities*

One qualitative study explored the exercise behaviours among Chinese immigrants with CVD in the community. These Chinese participants were reported as actively performing exercise (King et al., 2007), described as walking, Tai Chi and swimming on a regular basis. Another quantitative study (Shi et al., 2024) demonstrated that only 17.19% of the sampled Chinese immigrants with

coronary heart disease achieved the recommended moderate-intensity exercise per week, and the daily step count was 4848, which was lower than suggested.

2.5.2.3 Medication adherence

Four papers detailed the self-reported medication adherence among Chinese immigrants living with CVD. These studies showed that Chinese participants prioritized Western medication rather than Traditional Chinese medicine (TCM) for treating their CVD. One survey study found that 77.2% of Chinese immigrants self-reported that they took their cardiac medication consistently (King-Shier et al., 2018). This high cardiac medication adherence was positively associated with being able to afford medication, remembering to take medication (King-Shier et al., 2017) and believing they needed to take the medication (King-Shier et al., 2018). Moreover, in another study that used interviews (King-Shier et al., 2017), participants reported that communicating effectively with physicians and accepting they needed to take the medication as a fact of life helped them take their cardiac medications consistently. In addition, they explained that they took cardiac medications for symptom relief and disease control.

Western medications were described as the first line treatment for their heart disease because this was perceived as an acute condition. By comparison, most Chinese participants adopted some TCM (such as Chinese herbs or acupuncture) for other chronic diseases or to promote their general health (Jin et al., 2020; King et al., 2007). For example, one participant (King et al., 2007) drank herbal tea on a regular basis to remove the lipids of greasy meals from their blood. Some participants combined Western medications with TCM when their cardiac symptoms were poorly controlled (King-Shier et al., 2017; King et al., 2007). In interviews, Jin et al. (2020) reported that participants said they did not disclose details of using TCM to their physicians because the physicians may be concerned about drug interactions, although it was not clear whether this applied to medication use as a primary or secondary prevention behaviour. Conversely, some participants gave up TCM due to the side effects and high price of these medicines in Western countries (King et al., 2007).

2.5.2.4 Health seeking behaviours

Three studies examined the Chinese immigrants' health-seeking experiences, reflecting their self-care behaviours in response to their CVD diagnosis. Regarding seeking health information

and resources, the majority of Chinese participants diligently and actively searched out the best health information for their CVD (King et al., 2007). For example, at an early stage of their CVD diagnosis, they immediately sought information related to their treatment, rather than spending time coming to terms with their CVD diagnosis. In another study (Jin et al., 2020), most Chinese participants reported that they sought heart disease-related information from their friends or family who were in China, or from Chinese websites or media. Once again, the study failed to indicate if this was a primary or secondary prevention self-care behaviour.

In terms of seeking health care services, in two studies all Chinese participants chose Western-trained physicians for their heart disease (Jin et al., 2020; King et al., 2007). Some participants only trusted Western health services for their heart disease (King-Shier et al., 2018) but preferred Chinese-speaking physicians. Moreover, they actively participated in medical care, following up doctors' appointments and consulting with multidisciplinary health practitioners. Similarly, in a multi-ethnic study, 93% of Chinese participants consulted consistently with their doctors on cardiac medications, although the proportion was slightly lower than reported for other ethnic groups (White 100% and South Asian 94.9%). High cardiac rehabilitation attendance was reported in a Canadian study (King et al., 2007) but low attendance in an Australian study (Jin et al., 2020), with many reporting they did not know about cardiac rehabilitation programs or had no referral. In addition, one participant described in a qualitative study (Jin et al., 2020) how being aware of their CVD diagnosis, they accessed the Emergency Department (ED) immediately when having chest pain. Conversely, a large multi-ethnic study stressed that the time taken to present to ED for symptoms of acute coronary syndrome was too long (at 5.53 to 7.41 hours) to allow effective treatments to be used, but there was no significant difference in time to ED presentation between people of White, Chinese and South Asian ethnicities.

2.5.3 Review question 2: Related cultural factors

In response to the second review question, five papers examined the impact of cultural factors on the CVD self-care behaviours of Chinese immigrants (Jin et al., 2020; King-Shier et al., 2017, 2018, 2019; King et al., 2007). From general to specific self-care behaviours, studies reported the impact of language barriers, family roles, cultural beliefs, health belief systems, and other culturally-based factors across the spectrum of self-care behaviours.

2.5.3.1 Language barriers

Firstly, for Chinese immigrants from non-English speaking countries or with limited English proficiency, language barriers hampered their experience of seeking healthcare in their host country (Jin et al., 2020). In one study (Jin et al., 2020), one participant changed cardiac specialists multiple times until he found a Chinese-speaking cardiologist. Moreover, most participants in the study searched for heart-related health information from Chinese websites, friends or family in China. These information-seeking behaviours were in part at least due to the unavailability of culturally and linguistically tailored health education resources and programs in their Western countries of residence, and difficulties in engaging with English language information services provided in their host country (Jin et al., 2020). Conversely, in another study, the language barriers were perceived as managed well by participants' family members who played a role as interpreters in healthcare encounters (King et al., 2007).

2.5.3.2 Family role

As well as interpreting health information, family played an important role in influencing participants' CVD self-care behaviours following their CVD diagnosis. This was reported as involving moving to healthy lifestyle choices and attending medical appointments (Jin et al., 2020; King et al., 2007). For example, all participants reported shifting to a healthier diet with less salt, fat and sugar following the family's suggestions (Jin et al., 2020). In terms of the gender roles in Chinese family relationships, male participants were reported to receive more support from their wives who prepared their daily meals and supervised their self-care behaviours, whereas female participants were supported more by their children (King et al., 2007). Moreover, the view of filial duty endorsed in Chinese culture helped participants manage their CVD, particularly in an extended family. Children or grandchildren often took participants for medical appointments (Jin et al., 2020).

2.5.3.3 Cultural beliefs

Cultural beliefs could also influence self-care behaviours. In one study (King et al., 2007), Chinese participants reported that their traditional beliefs of keeping the peace in life or acceptance and the Confucian philosophy of staying present played a significant role in their self-care of CVD. For instance, Chinese participants in this study quickly and actively sought out the best

healthcare rather than dwelling on their receipt of a CVD diagnosis (King et al., 2007). Similarly, this was supported by King-Shier et al. (2017), where accepting the need for cardiac medication as a part of their daily life motivated participants to take medication consistently. On the other hand, holding the cultural belief that they should take control of their fate could negatively influence their medication adherence, where resulted in participants making their own decisions about adjusting their cardiac medications and whether to take their medications (King et al., 2007). Furthermore, making the decisions themselves on which medication to take could prevent patients from taking their cardiac medications consistently (King-Shier et al., 2018).

Cultural beliefs were also integrated into dietary customs, which could positively impact dietary-related self-care behaviours. Chinese participants in one study (King et al., 2007) preferred to eat home-made traditional Chinese meals with more vegetables and less meat, as this was believed to be better for their heart disease. This was in line with the dietary regime recommended by health practitioners. Some patients controlled their food consumption for weight management following the traditional belief that "eating is not for satiety" (King et al., 2007, p. 817). Considering the importance of these factors in relation to their particular cultural beliefs, most participants sought Chinese-speaking physicians who could understand them culturally as well as linguistically (Jin et al., 2020; King-Shier et al., 2017; King et al., 2007).

2.5.3.4 Health belief systems

Their health belief systems shaped many Chinese immigrants' self-care behaviours for their CVD, specifically in relation to their medication adherence. In terms of their perceptions of health and disease, in one study, Chinese participants stated that they valued a healthy life more than a long life, which motivated their medication adherence (King-Shier et al., 2017). Regarding their health beliefs on medication treatment, Chinese participants trusted and took Western medications as a first-line treatment as they believed that heart disease was an acute condition which needed their prescribed cardiac medications (King-Shier et al., 2018) rather than TCM which was more often applied for general health and disease prevention (Jin et al., 2020; King et al., 2007). Some participants gave up TCM due to their beliefs that the interaction between prescribed Western medications and TCM may have adverse CVD outcomes (King et al., 2007); others believed they could combine the two approaches to achieve better disease outcomes (Jin et al., 2020; King-Shier et al., 2017; King et al., 2007). However, participants commonly did not

disclose their use of TCM to their doctors, which may have resulted in vulnerability to drug interactions (Jin et al., 2020).

Other cultural factors identified included having strong social networks with their country of origin, which helped Chinese participants source emotional support and health-related information (Jin et al., 2020).

2.6 Discussion

To the best of our knowledge, this is the first integrative review to investigate the self-care behaviours among Chinese immigrants with CVD living in Western countries. Targeting Chinese first-generation immigrants, only seven studies were found reporting their self-care behaviours after their CVD diagnosis and examining the impact of cultural factors. This limited number of studies indicates that this topic is under-explored and needs further research. This is very important considering the large and increasing but also aging Chinese immigrant population in Western countries, and the increasing prevalence of CVD (Gong & Zhao, 2016).

One of the most frequently mentioned self-care behaviours in the included papers concerned dietary choices. Major changes in diet are always challenging in that the dietary habits of adults have been embedded in daily life over decades (Riegel et al., 2017). It was confronting for Chinese immigrants to adjust their diet in line with CVD dietary regimen recommendations in host countries. For example, Chinese participants with CVD have been reported to find it difficult to follow salt reduction recommendations (Davidson et al., 2011). Following their immigration, Chinese immigrants had been exposed to Western food and changes in their dietary practices, adopting patterns of high energy, fat and sugar consumption (Tseng et al., 2015). The longer the duration of residence, the more likely that Chinese immigrants had embedded Western dietary customs into their daily lives (Eh et al., 2016). In addition, compared to Western standard diets, a traditional Chinese diet is significantly healthier, particularly in maintaining body mass index and lean body mass (Frida et al., 2016). However, some who retained traditional Chinese diets encountered difficulties in accessing and affording these foods in Western communities. Conversely, two qualitative studies in this review highlighted that Chinese participants changed their diet straightaway after being diagnosed with CVD (Jin et al., 2020; King et al., 2007); these two studies were separated in time by more than 10 years, indicating this may be a sustained response in this population.

Another important element of CVD self-care behaviours focused on regular exercise. Very little is known about how Chinese immigrants with CVD manage physical activity, as only two studies mentioned this. Chinese participants in the qualitative study presented themselves as actively engaging in exercise (King et al., 2007). This was inconsistent with a previous study, which demonstrated that Chinese participants preferred rest and not to exercise rather than participating in formal cardiac rehabilitation, believing that rest was more beneficial following their diagnosis of CVD (Davidson et al., 2011). Some at least of this difference may be explained by the different sampling settings: one study sampled people in the community, and another recruited in hospital settings. Participants recruited from the community may have had longer CVD histories with better self-care skills and more confidence to undertake exercise. Moreover, another included quantitative paper demonstrated that the intensity of exercise was inadequate among this Chinese population. This may be attributed to their poor health knowledge of national physical activity guidelines.

In this review, Chinese immigrants reported good medication adherence for their CVD self-care, which is consistent with previous studies on medication adherence for chronic disease or condition management. For example, a study (Eh et al., 2016) of diabetes self-management showed that 80% of Chinese immigrants with type 2 diabetes followed their medication regimen. This may be associated with the belief in the benefit of Western medication in achieving better disease outcomes (Jin et al., 2020; King-Shier et al., 2017, 2018; King et al., 2007). It might also be the case that higher medication adherence was predicted by higher levels of adaptation to Western societies (Eh et al., 2016). Conversely, participants used TCM for general health maintenance and uncontrolled CVD symptoms by Chinese participants in the review (Jin et al., 2020; King et al., 2007), which contradicted the findings of previous studies (Wang & Matthews, 2010; Zhang et al., 2018). This discrepancy warrants further investigation but indicates the importance for clinical nurses to avoid stereotyping the use of TCM among Chinese immigrants with CVD. To improve medication adherence, it would be beneficial for nurses to assess Chinese patients' medication history including their medication beliefs, attitudes and decision-making, and provide tailored health education pertinent to cardiac medications.

Although Chinese immigrants reported actively and diligently seeking out health-related information and healthcare resources compared to other ethnic groups with more passive health-seeking behaviours (Bedi et al., 2008; King et al., 2007), they sought heart-related information from their friends or family who were in China, or from Chinese websites or media (Jin et al., 2020). This is consistent with another study (Chen et al., 2010) exploring the health

information-seeking behaviours among Chinese Americans, where the three main sources of health information accessed were printed materials written in Chinese, Chinese family and friends, and health practitioners. This review found that some Chinese Australian immigrants failed to attend cardiac rehabilitation as they did not know about the programs (Jin et al., 2020). This is supported by the findings of a systematic review including 33 eligible papers which assessed the quality and cultural sensitivity of CVD-related health information targeting Chinese immigrants in Western countries, revealing a significant lack of key information regarding heart rehabilitation in health education sources (Li et al., 2018). Development and provision of culturally and linguistically appropriate health information and education programs for Chinese immigrants is clearly warranted. Before providing standardized health education, clinical nurses could evaluate Chinese patients' level of acculturation, identifying to what degree they have adapted their daily lifestyle practices. Whilst recommending the adoption of the lifestyle regimens prescribed by the host country, nurses could also encourage Chinese immigrants to retain their healthy Chinese cultural practices (such as traditional diets), to improve their practice of self-care behaviours (Deng et al., 2013).

Unsurprisingly, one cultural factor that may have a broad impact across multiple self-care behaviours is language. Nearly one-third of Chinese immigrants in Australia have poor English language proficiency (Robertson et al, 2022). This poses significant barriers to interacting with healthcare providers and accessing health-related information or services. In this review, participants relied on family members to interpret health-related encounters. This contravenes Australian health policy which mandates that all health organizations provide interpretation services where patients from non-English-speaking backgrounds self-identify that they require this support (Health and Social Policy, 2017). The poor use of interpretation services could be explained by the distrust held by some people that interpreters can fully convey information from health practitioners, resulting in miscommunication (Chen et al., 2010; Feiring & Westdahl, 2020). In addition, the concept of privacy is valued in Chinese culture; people do not disclose their family or health information to others who are outside of the family (Feiring & Westdahl, 2020). Therefore, Chinese immigrants may be reluctant to request or use formal interpretation services.

Another source of broadly based cultural influence is the role of family. In the review, family support was significantly threaded throughout patients' self-care behaviours including their access to health services, lifestyle adjustments and decision-making. This finding is consistent with other studies (Daly et al., 2002; Davidson et al., 2011; Simon et al., 2018; Zhang et al., 2018),

indicating that the family is a central part of Chinese cultural norms (Zhang et al., 2018). It is therefore important for clinical nurses to acknowledge and involve family members in CVD health education programs.

2.7 Limitations

The main limitations of this integrative review are the very small number of eligible studies retrieved, and the predominant focus on Chinese immigrants to Canada (five of seven included studies). In part, this was related to the specific target of the review at first-generation Chinese immigrants, which narrowed the literature search. It may also be related to the recognised limitations of computerized database searches, which have been shown to access as little as 50% of all eligible studies due to discordant search terminologies and indexing nuances (Whittemore & Knafl, 2005). For example, for this review, “Chinese immigrants” could be referred to as Chinese Canadian, Chinese or Chinese Australian depending on the countries of origin. Additionally, some of the included papers did not distinguish secondary from primary prevention behaviours among Chinese participants, which may have resulted in interpretation bias.

2.8 Conclusions

The most prominent finding of this review was the scarcity of literature on self-care behaviours and related cultural considerations among Chinese first-generation immigrants living with CVD in Western countries. Given the large and growing size and ageing of this population internationally, this indicates the priority need for nurses to undertake further research to support service development in this area. It is important for clinical nurses to avoid stereotyping and acknowledge that Chinese immigrants may often opt to actively manage their CVD, including via lifestyle modifications, high adherence to Western medication regimes, and proactive health information seeking. However, they may lack evidence-based CVD health education or instruction, resulting in inadequate CVD self-care behaviours. Moreover, it would be beneficial to involve family members in nurse-initiated health education programs, given the importance of their contribution to behavioural decisions for patients. The development of culturally and linguistically sensitive health resources and education programs targeting Chinese immigrants with known CVD is urgently needed to improve their self-care knowledge and promote their self-care skills.

2.9 Relevance to clinical practice

Self-care is the cornerstone for patients living with cardiovascular disease but is challenging as it is intertwined with a range of personal, social and cultural factors. It is important that clinical nurses avoid cultural stereotyping of Chinese immigrant patients and acknowledge the importance of nursing assessment before providing them with heart health education. The development of culturally and linguistically sensitive health resources and education programs is urgently needed to improve Chinese immigrants' knowledge and skills of evidence-based CVD self-care. Acute and community nurses who are experienced in caring for Chinese patients play an essential role in helping improve nursing cultural sensitivity and practices and develop culturally acceptable health education programs.

2.10 Chapter summary

The limited number of publications retrieved and included in the integrative review indicated that self-care behaviours among Chinese first-generation immigrants living with CVD in Western countries are not well-explored or well-known. Inconsistent findings from qualitative and quantitative studies on dietary adjustment and physical activities were identified. No study explored how Chinese immigrants with CVD monitor and respond to their CVD-related symptoms (chest pain, shortness of breath), which is an essential component of CVD self-care (Riegel et al., 2012).

The integrative review illustrated the impact of cultural factors on the self-care behaviours practised by Chinese immigrants with CVD, including language barriers, family roles, cultural beliefs and health belief systems. For immigrant populations, moving to a new country inevitably involves different degrees of learning a new culture (Berry, 2009). This cultural adaption or acculturation is a complex and dynamic process, depending on individual experience and the need to change their culture of origin (Berry, 1997). However, no paper in this integrative review explored the acculturation experience of Chinese immigrants and the related impact on their CVD self-care behaviours.

Chapter 3 Research Methods

3.1 Chapter introduction

Given the paucity of information demonstrated by the integrative review of literature on this topic (in Chapter 2), the aims of this research were to address this gap in knowledge by identifying the self-care practices and related factors of Chinese immigrants living with CVD in Australia, exploring their acculturation experiences and investigating the impact of these acculturation experiences on their self-care behaviours. This chapter sets out the rationale and processes of the selected research methodology and methods of this thesis.

The following questions were asked to address the overarching aim of this research project set out in Section 1.5:

1. What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, symptom monitoring and responses?
2. What factors impact the CVD self-care behaviours of Chinese Australians?
3. What are their acculturation experiences in terms of cultural practices, cultural values and beliefs and cultural identification?
4. How do Chinese Australians' unique acculturation experiences impact their self-care practices of CVD?

3.2 Research design

3.2.1 Pragmatic paradigm

A pragmatic stance was assumed in this research project. As a relatively new philosophical worldview, pragmatism focuses on addressing practical issues without being restricted by ideology or principle (Mayumi & Ota, 2023; Morgan, 2007). Pragmatism prioritises the importance of the research questions rather than the philosophy paradigm or research methods. Thus, researchers can use diverse methods of data collection depending on which works best to address the research questions (Morgan, 2007; Tashakkori & Teddlie, 2010). It is common to use both qualitative and quantitative methodologies in a single research study grounded on a pragmatic stance. Accordingly, pragmatism is endorsed by many researchers as an appropriate paradigm for mixed methods research (Creswell & Plano Clark, 2017; Tashakkori & Teddlie, 2010).

3.2.2 Mixed methods methodology

Consistent with a pragmatic stance, a mixed methods design was employed in this study. Mixed methods approaches are problem-centred so that researchers are free to select the research designs and strategies that are best matched to their research problems and are not limited to any one philosophy (Creswell & Creswell, 2018, pp. 4–10). By using a mixed methods approach, researchers can integrate elements of qualitative and quantitative research methods to pursue a more complete understanding of a research topic that is understudied (Johnson et al., 2007). Findings of the integrative review identified that the impact of acculturation on self-care behaviours among Chinese immigrants with CVD was not well studied globally, including for Chinese Australians. Thus, a mixed methods approach was an appropriate methodology to answer the research questions relevant to this topic and achieve a greater breadth and depth of knowledge on how Chinese immigrants take care of their CVD in a cross-cultural context.

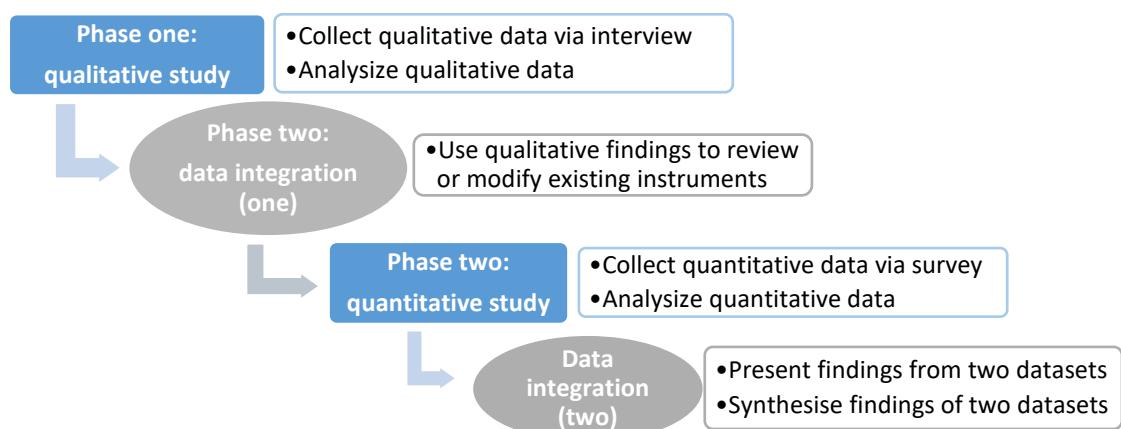
3.2.3 Mixed methods research design

Specifically, a mixed methods exploratory sequential design was employed in this study. Exploratory sequential design is an approach that starts with a qualitative phase to explore the phenomenon of interest followed by development or refinement and then a quantitative instrument grounded in the qualitative findings to further explore or generalise the qualitative findings (Creswell & Plano Clark, 2017). It is particularly suitable for a research population or phenomenon that is not well-researched and culturally specific and where there is a need to review an existing instrument prior to use to ensure that it is relevant and culturally sensitive for the specific participants and contexts (Creswell & Plano Clark, 2017). Based on the results of the integrative review reported in Chapter 2, only seven studies, including two studies in Australia, had explored self-care behaviours among Chinese immigrants with CVD living in Western countries, which indicates that research on this phenomenon in these populations is underdeveloped, especially in the Australian context. A flowchart of this study design is presented in Figure 3-1.

In this study, the design encompassed two phases:

- In phase one, qualitative interviews were chosen to allow participants to describe, in their own words, their self-care practices and identify the barriers or enablers they perceived to influence their self-care practice, and to explore their acculturation experiences and the impact of these acculturation experiences on their self-care practices.
- In phase two, the qualitative findings were used to select and examine the variables within two existing instruments: the Self-care for Coronary Heart Disease Inventory (SC-CHDI) Version 3.0 and the Suinn-Lew Asian Self-Identity Acculturation scale (SL-ASIA scale). The first objective was to determine whether these instruments were adequate, acceptable and culturally sensitive for Chinese Australians. The chosen instruments were modified as required and other instruments were selected in light of the qualitative findings. This was the first point of data integration. The reviewed and modified instruments and the additional instruments were then used to assess the self-care behaviours and related factors and examine the level of acculturation and its association with CVD self-care behaviours among a large sample of Chinese Australians with CVD using a survey design.
- Finally, the two sets of findings, both qualitative and quantitative, were integrated and interpreted to best answer the research questions and provide recommendations for clinicians, health managers, policymakers and researchers (Creswell & Plano Clark, 2017).

Figure 3-1 Flowchart of the study process



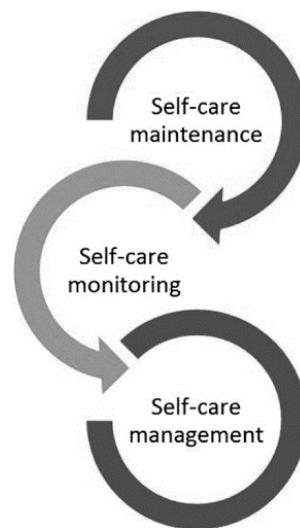
3.3 Theoretical frameworks of the study

In this study, two theoretical frameworks were used, as shown in Figure 3-1.

3.3.1 The Middle-Range Theory of Self-Care of Chronic Illness

The first theoretical framework applied was the Middle-Range Theory of Self-Care of Chronic Illness. In the discipline of nursing, middle-range theories are commonly employed to generate nursing knowledge by exploring and explaining phenomena pertinent to caring-healing processes (Smith, 2018). The Middle-Range Theory of Self-Care of Chronic Illness proposed by Barbara Riegel and her colleagues was employed to guide this study to comprehensively explore self-care practices among Chinese Australians diagnosed with CVD. This widely cited theory stemmed from the clinical experiences of practitioners caring for patients with heart failure. It specifies three core concepts in self-care behaviours: self-care maintenance, self-care monitoring and self-care management (Riegel et al., 2012) (Figure 3-2). Later, the Middle-Range Theory of Self-Care of Chronic Illness was revised to integrate symptom theory (Riegel et al., 2019). In the project of this thesis, the self-care instrument used for the phase two study was based on the original Middle-Range Theory of Self-Care of Chronic Illness. Thus, the original framework was retained to keep the theoretical framework consistent across phase one qualitative and phase two quantitative studies.

Figure 3-2 The Middle-Range Theory of Self-Care of Chronic Illness (Riegel et al., 2012)



As explained in Section 1.2.4, self-care maintenance was defined as practices performed to control disease deterioration or maintain health status, which includes lifestyle modification (such as maintaining a healthy diet, regular exercise and not smoking) and medication adherence. Self-care monitoring refers to activities taken to observe body symptoms and

recognise any changes, for instance, checking blood pressure or blood glucose. Self-care management refers to patients' responses to emerging symptoms or body changes followed by health-seeking behaviours and treatment compliance (Osokpo & Riegel, 2021; Riegel et al., 2012).

The strengths of this theory are that it provides a framework to specify the particular self-care practices that an individual patient may be struggling with, which enables further targeting of interventions (Riegel et al., 2012). In this project, for the phase one qualitative study, the Middle-Range Theory of Self-Care of Chronic Illness was employed to generate the initial interview guide with probing questions to explore self-care behaviours among Chinese Australians with CVD to provide rich descriptions across the three domains of self-care maintenance, self-care monitoring and self-care management. For instance, if participants' description of their self-care experience was limited, they were invited or prompted to expand on their self-care experiences by asking them specific questions based on the component elements of the Middle-Range Theory of Self-Care of Chronic Illness, such as, "How do you normally monitor your symptoms?" and "What do you do if you have angina?" Further, the theory was used to deductively inform the thematic analysis by setting up predetermined codes or themes.

This structured self-care theoretical framework can also be used to guide researchers in the development of measurement instruments for general or illness-specific self-care (Riegel et al., 2012). Thus, the SC-CHDI versions 2.2 and 3.0 were developed based upon the Middle-Range Theory of Self-Care of Chronic Illness to target populations with stable coronary heart disease (Vaughan Dickson et al., 2017). Compared to SC-CHDI version 2.2, version 3.0 was expanded to reflect the theoretical concepts of self-care maintenance, monitoring and management in the Middle-Range Theory of Self-Care of Chronic Illness. In the phase two quantitative study, SC-CHDI version 3.0 was used to collect and analyse data to identify the CVD self-care behaviours among Chinese immigrants in Australia.

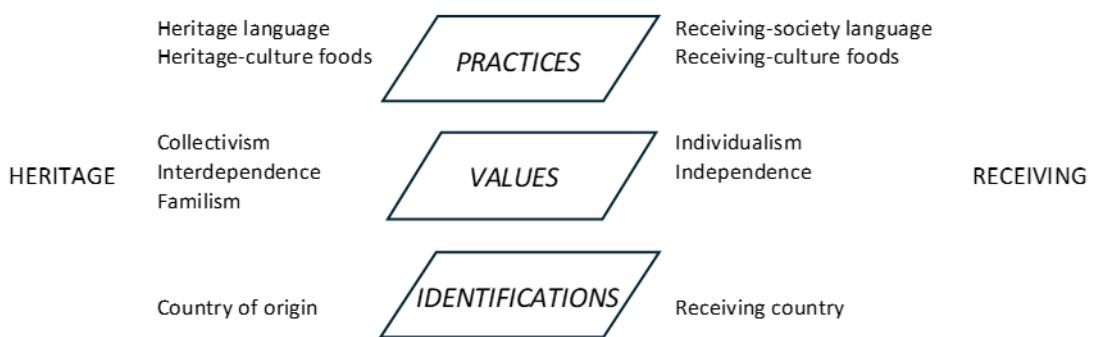
3.3.2 The multidimensionality of acculturation

The second theoretical framework used in this study was related to acculturation. As explained in Chapter 1, acculturation is a complex and multidimensional change process that occurs when two different cultures interact (Berry, 2019). Based on the existing models of acculturation and critique, Schwartz and colleagues (2010) proposed an expanded model to conceptualise acculturation in a way that could generate a more comprehensive understanding of the course

of the acculturation experience in line with contextual and individual functioning. The resultant changes are explored in three dimensions: cultural practices (language use, media preferences, social interaction and cultural foods), cultural values (cultural beliefs) and cultural identification (attachment to cultural group) in relation to the original culture and the host culture, respectively (Schwartz et al., 2010)(Figure 3-3).

Figure 3-3 *The six-component model of acculturation (Schwartz et al., 2010)*

Multidimensionality of Acculturation



The figure is adapted from Schwartz et al., 2010

This conceptual model of acculturation was used to explore Chinese Australians' perspectives and experiences of cultural adaptation embedded in their daily life through the data collected and analysed. For the phase one qualitative study, the conceptual model was used to generate the initial interview guide with probe questions to explore cultural adaptation experiences among Chinese Australians with CVD within the three main domains of cultural practices, cultural values and cultural identifications. As before, if participants' description of their acculturation experience was limited, probe questions were asked to expand their responses by asking specific questions based on the component elements of the conceptual model of acculturation. This model was also used to deductively guide the thematic analysis by setting up predetermined codes.

In the phase two quantitative study, this conceptual model of acculturation guided the selection of acculturation instruments from existing literature. Thus, the multidimensional SL-ASIA scale was chosen because it assesses acculturation in a range of domains, such as language use, media preference, ethnic social interaction, food preference, cultural values and affinity for ethnic identity and pride (Suinn et al., 1992). This is in line with the conceptual model of acculturation

adopted for this study. This scale was further used to collect and analyse data to describe the level of acculturation in terms of cultural practices, values and identification among Chinese immigrants in Australia.

3.4 Phase one: Qualitative study

3.4.1 Study design

A qualitative descriptive approach was employed to explore Chinese Australians' experiences regarding CVD self-care and the impact of acculturation processes on these self-care behaviours. Compared to other qualitative approaches, qualitative description is centred on an in-depth understanding of the phenomenon of interest directly and literally through presenting the facts or the worldviews of those experiencing the phenomenon of interest (Bradshaw et al., 2017; Sandelowski, 2000, 2010). In line with the philosophical assumptions of naturalism and constructivism, qualitative descriptive research generates an understanding of a phenomenon by providing opportunities for participants to describe their experiences or perspectives in their natural context (Bradshaw et al., 2017; Sandelowski, 2000). In a field where evidence is scarce, a qualitative descriptive approach is an appropriate choice for early exploratory work and provides a rich description of a phenomenon within limited time and resources (Bradshaw et al., 2017). It is particularly suitable where, as part of a mixed methods approach, the result of the qualitative descriptive approach can support the development of a questionnaire or refinement of an existing instrument.

For this research, the phenomenon of interest (the self-care behaviours and related cultural factors of Chinese immigrants living with CVD) was not well studied. A qualitative descriptive approach provided an in-depth and robust description of how the dynamic and complex processes of acculturation impact Chinese Australians' beliefs, attitudes and perceptions that further influenced their CVD health-related behaviours (Mao et al., 2020). Moreover, the generated qualitative findings informed the instrument selection and modification undertaken in phase two.

3.4.2 Study participants and sampling

3.4.2.1 *Recruitment criteria*

The recruitment criteria for this study were as follows. Participants were required:

1. To be first-generation Chinese immigrants in Australia comprised of adults born in Mainland China, Hong Kong, Macao or Taiwan who migrated to Australia at any stage of their life. They were required to be Australian permanent residents or citizens living in NSW, the most popular destination for Chinese immigrants to Australia; 45.9% of the total Chinese immigrant population in Australia resided there in 2016 (Robertson et al, 2022).
2. To have self-reported, medically diagnosed CVD.
3. To speak English or Mandarin.
4. To provide informed consent, that is, those with a history or evidence of impaired cognitive function were excluded.

3.4.2.2 *Sampling strategy*

Purposive sampling and snowball sampling were used to recruit eligible Chinese Australians with CVD, as these sampling methods are appropriate to select participants who can provide rich and in-depth information within limited research resources (Campbell et al., 2020). This was a ‘hard-to-recruit’ population: predominantly older people, many of whom had migrated at relatively older ages from a very different culture and did not speak English, living within the community with stable chronic disease. Recruitment options were also restricted by the movement limitations imposed during the COVID-19 pandemic and their contact with cardiologists was infrequent, limiting recruitment opportunities through community healthcare settings and eliminating hospitals as recruitment sites. Although the prevalence of CVD is rising among young populations, it is still more common among older adults (Australian Institute of Health and Welfare, 2024). Recruitment methods were chosen that were more likely to favour the recruitment of elderly Chinese immigrants who may have a relatively high chance of having CVD. This involved recruitment at Chinese community associations and through social media platforms (Sydney Today, 2ac Australian Chinese Radio and WeChat) all specifically chosen as they tended to be favoured by older immigrants. Hence purposive sampling was adopted where it was feasible to target knowledgeable informants from across the older age, sex and ethnic profile of this population. Where this was not possible, snowball sampling was used. Snowball sampling, relying on peer referral, is commonly used in qualitative research because it is an

effective approach to recruiting participants from hard-to-reach populations (Raifman et al., 2022). Chinese immigrants are a minority population in Australia, and only a subset of this population live with CVD. Thus, snowball sampling was a good fit for this study.

Potential participants were recruited via three main sources: Chinese community associations, social media and community medical centres (Chun et al., 2011; Jin et al., 2020; Mao et al., 2020; Zhang et al., 2020).

1. Chinese community associations: Chinese community associations in districts of Sydney with a high density of Chinese populations, including Hurstville, Rhodes, Burwood, Haymarket (Australian Bureau of Statistics, 2011), Chatswood and Eastwood (Wang & Matthews, 2010), were targeted for recruitment. The researcher (LZ) initially approached the managers of 13 Chinese community associations via email or phone call to seek permission and support for research recruitment. The following six Chinese community associations supported study recruitment:

- Eastwood Chinese Senior Citizens Club
- The Australian Catholic Chinese Community
- The Australian Asian Cultural Association
- The Chinese Christian Community Service Centre
- The Auburn Diversity Service Inc.
- The Chinese Australian Service Society.

Recruitment processes were affected by the COVID-19 pandemic and health measures put in place to restrict its spread. To be compliant with the public health orders of the NSW Government for the management of the COVID-19 pandemic in June 2021, the researcher (LZ) requested the managers to circulate electronic flyers (see Appendix 6) throughout their community WeChat, Facebook and other online channels. However, the response was slow and limited, and an adequate sample was not obtained through this method of online recruitment alone. After the government relaxed some of the COVID-19 restrictions and the number of COVID-19 cases in the community decreased in May 2022, the researcher LZ joined in with community outdoor and volunteer activities held by the Chinese Christian Community Service Centre, which was compliant with the NSW COVID-19 regulations at the time. The researcher LZ distributed paper copies of the flyer to potential participants and introduced the research project in person. Potential participants were asked to contact the researcher LZ via phone using a phone number used only for this study.

2. Social media: Electronic information flyers in Chinese and English were distributed via social media platforms and social tools that were widely used by Chinese communities in Australia. These included Sydney Today, 2ac Australian Chinese Radio and WeChat. Sydney Today is one of the biggest multi-purpose Chinese media and information platforms in Sydney, including online websites, mobile apps and subscription accounts in WeChat. A recruitment flyer and blog article were used to introduce the research project, which was posted in the Sydney Today health column. The 2ac Australian Chinese Radio station is the only Chinese radio station in Sydney and broadcasts programs in both Cantonese and Mandarin. Researcher LZ attended 2ac Australian Chinese Radio and introduced the research project on air and invited the recruitment of participants. The most popular social tool among Chinese immigrants, WeChat, was used to disseminate the recruitment flyers. All potential participants who met the recruitment criteria were asked to contact the researcher LZ via phone or WeChat code.

3. Clinic settings: To obtain an adequate sample, permission was sought from practice managers at MyHealth medical centres serving areas with a high number of people of Chinese origin in Sydney to distribute recruitment flyers at the clinic and encourage eligible participants to contact researcher LZ (see Appendix 6). Paper-based information flyers written in Chinese and English were distributed at the MyHealth medical centre at Parramatta. Potential participants were asked to contact researcher LZ via mobile phone using a phone number used only for this study.

The researcher LZ initially screened participants who were interested in this research using the eligibility criteria and explained the research project to suitable potential participants over the phone. Potential participants who met the recruitment criteria were provided an information sheet and consent form (see Appendix 7) via WeChat, text message or email. Dates and times for an interview were discussed between researcher LZ and participants.

3.4.2.3 Sample size

Based on the approach to sample estimation that is commonly applied in qualitative research (Whitehead & Whitehead, 2016, p. 114), recruitment continued until the interview dataset reached data saturation; that is, until no more new information was collected from participants during the interview (Charmaz, 2006; Creswell & Creswell, 2018, p. 186). During data collection, following each interview, researcher LZ listened to the audio record and reflected on the content. After the 18th interview, there were no new themes emerged from the interviews, which indicated

that the data collection may have reached saturation (Saunders et al., 2018). The 19th and 20th interviews confirmed that no new codes were added to the overall story of how Chinese immigrants managed their CVD in a cross-cultural context. Recruitment started in September 2021 and ended in May 2022 when data saturation was reached (Bradshaw et al., 2017). In total, 20 participants were recruited for the phase one qualitative study.

3.4.3 Data collection

3.4.3.1 *The data collection process*

Within the restriction of the social distancing public health orders in place at the time due to the COVID-19 pandemic, the interviews were conducted via phone. The bilingual researcher LZ interviewed participants in their preferred language, which for all of them was Mandarin (Jin et al., 2020). Before the interview started, the researcher LZ introduced herself and her research position and explained the interview procedure to participants to generate a warm and non-judgemental environment. With participants' audio-recorded oral consent, the interview was audio-recorded using two recorders: an app on a smartphone and a digital voice recorder. Interviews were expected to be completed within around 60 minutes. Field notes were taken by researcher LZ during each interview.

3.4.3.2 *The data collection instrument*

Semi-structured interviews were used to collect the data. The interview questions were initially crafted by researcher LZ in line with the research questions guided by the Middle-Range Theory of Self-Care of Chronic Illness (Riegel et al., 2012; Vaughan Dickson et al., 2017) and the conceptual model of acculturation (Schwartz et al., 2010). One of the supervisors (LP) reviewed and commented on the interview guide to render it user-friendly and conversational for participants to engage with. Multiple meetings and revisions occurred between researcher LZ and supervisor LP until the final interview guide was agreed upon. This entailed first inviting the participants to share their experience of managing their CVD in the context of cultural adjustment and adaptation. Questions initially asked participants to identify what aspects of their daily lives, family and individual practices and personal behaviours had potentially been affected by their cardiovascular health. Subsequently, they were asked to talk about what aspects were of cultural significance to them and to describe any changes occurring over time

following their migration. Probes were used to enable the participants to identify any important issues that were related to their CVD self-care practices, especially the impact of cultural adaptation. Participants' basic demographic (Jin et al., 2017b; Lai & Surood, 2009) and clinical health information was collected via structured questions.

The initial interview guide was piloted among the researcher's family and friends, and comments were sought. The interview guide (see Appendix 8) was further refined through reflection on the interview with the first participants during this piloting process. After each interview, researcher LZ listened to the audio recording and analysed the participant's response to each interview question. The researcher refined the interview guide based on participants' answers and engagement with the interviewer. One supervisor (LP) reviewed the updated interview guide following each interview reflection. Feedback was given on an ongoing basis from all supervisors to support developing interview skills. No further changes were made to the interview guide after the first eight interviews were conducted. This process was recorded in an interview audit trail and discussed with the supervisors.

3.4.3.3 Data preparation

All the audio files and field notes were immediately uploaded onto a password-protected laptop and OneDrive-UTS. All the audio files were transcribed verbatim (Clark et al., 2017) in Chinese by researcher LZ. According to Twinn's (1997) method of translation practice in cross-language interviewing, an independent translator employed to translate interview transcripts can improve the translation consistency and reliability of the data (Al-Amer et al., 2015). In this study, one professional translator was employed to translate 15 transcripts into English, and then the bilingual researcher LZ validated them. Discussion was set up between the two translators when disagreement occurred. With limited funding for translation services, the other five transcripts were translated by researcher LZ who is an accredited translator with a certificate issued by the National Accreditation Authority for Translators and Interpreters. To ensure accuracy and reliability, one of the supervisors (XX), who is also a bilingual researcher, audited one of five translated transcripts. No changes were required at this stage. All the translated transcripts were imported into NVivo 12 software for data analysis.

3.4.4 Data analysis

For this phase of the study, thematic analysis was used in line with Sandelowski's description of the approach of qualitative description (Sandelowski, 2000, 2010; see also Bradshaw et al., 2017). Thematic analysis seeks to identify the underlying ideas and repeated patterns across all forms of qualitative data to generate rich descriptions and unanticipated insights (Braun & Clarke, 2006). According to Braun and Clarke's guideline (2006), the researcher (LZ) initially immersed herself in the data set by repeatedly listening to the audio recordings for transcription and reading the transcripts for translation and validation, which also functioned as the initial stage of analysis. The specific methods in response to research questions are described below.

Research question 1: What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, symptom monitoring and responses?

To address this research question, the Middle-Range Theory of Self-Care of Chronic Illness proposed by Barbara Riegel et al.(2012) and related self-care inventory (Vaughan Dickson et al., 2017) were used to deductively guide thematic analysis by developing a predetermined list of codes. A preconceived theoretical framework can be used to guide data collection and analysis in the qualitative descriptive approach, and these processes do not necessarily need to be restricted to the theoretical framework (Sandelowski, 2010). Therefore, in this study, codes included, but were not limited to, self-care maintenance (diet adjustment, regular exercise and medication adherence), self-care monitoring (regular medical follow-up and monitoring of weight, blood pressure and blood glucose) and self-care management (adjusting the medical regime and health-seeking behaviours). The researcher LZ inductively generated new codes by reading the transcript line-by-line and coding for topic content.

Research question 2: What factors impact CVD self-care behaviours of Chinese Australians?

This was addressed by coding findings based on research question one. By reading the retrieved and coded data in line with participants' CVD self-care behaviours, researcher LZ extracted the data regarding the perceived enablers and barriers to their CVD self-care behaviours. Researcher LZ organised the codes from the extracted data and grouped them as enablers and barriers. Overall transcripts were checked to track any missed data or codes addressing research question two. Once again, the process and coding results were discussed among the research team (LZ, LP, XX).

Research question 3: What were their acculturation experiences in terms of cultural practices, cultural values and beliefs and cultural identification?

A combination of deductive and inductive thematic analysis was employed to address research question three. The conceptual model of acculturation (Schwartz et al., 2010) was used to construct predetermined codes, including cultural practices (language use, media access, social interaction and food preference), cultural values (collectivism, health beliefs) and cultural identifications. Meanwhile, additional codes were generated inductively by researcher LZ reading the transcripts line-by-line and coding topic content.

Next, researcher LZ categorised these initial codes into potential themes as part of an iterative process of sorting and theming. A thematic map was generated and used in the early stages of searching for themes. Researcher LZ pondered the relationship between codes and proposed potential themes at different levels. Once the candidate themes emerged, researcher LZ collated the coded data to each identified theme (Braun & Clarke, 2006). The initial coding results were reviewed by the supervisors (LP and XX) and decisions on overarching themes were made within the research team (LZ, XX and LP). The researcher continued to check the coded and extracted data for consistency and coherence under each theme. Finally, the name of each theme was refined to fit with the overall coded data, again, as a process of discussion within the research team (LZ, LP, XX) over multiple meetings.

Research question 4: How do Chinese Australians' unique acculturation experiences impact their self-care practices for CVD?

This question was addressed by coding findings based on research question three. Reading the retrieved and coded data in line with participants' acculturation experiences (addressed in research question three), researcher LZ extracted the data that answered research question four. By applying the same themes and subthemes that were generated in response to research question three, researcher LZ organised the codes from the extracted data. The transcripts were checked to track any missed data or codes addressing research question four. Once again, the process and coding results were discussed among the research team (LZ, LP, XX).

3.4.5 Trustworthiness

Four major criteria were described by Lincoln and Guba (1985) to establish trustworthiness in qualitative research, comprising credibility, transferability, dependability and conformality.

3.4.5.1 *Credibility*

Credibility is the degree to which the qualitative data accurately reflect the reality of the population or phenomena being studied (Ahmed, 2024). It can be achieved by acknowledging personal bias and position throughout the study process, prolonging engagement in the study field to build rapport with participants for collecting rich data and using triangulation to verify findings (Ahmed, 2024; Dodgson, 2019). In this research, researcher LZ shared the same culture with the participants and was a registered nurse both in China and Australia with clinical experience in CVD. Thus, the bilingual researcher (LZ) could understand some local dialects and cultural health beliefs and practices, which facilitated the interviews. The researcher's non-judgemental attitude was explained to participants at the beginning of each interview. Researcher LZ prolonged engagement with participants and spent time joining group activities with participants at Chinese community associations. Moreover, researcher LZ and two supervisors engaged in peer debriefing and reflection during the data collection and analysis to enhance the credibility of the results.

3.4.5.2 *Transferability*

Transferability refers to the degree to which the qualitative findings can be applied to similar contexts or situations, which can be developed by thick description elaborating contextual information and describing sampling strategies (Ahmed, 2024; Kakar et al., 2023). In this study, comprehensive information on recruitment, study participants, location and the context of the research are provided in this chapter to allow readers to judge the applicability and relevance of the qualitative findings to alternative contexts.

3.4.5.3 *Dependability*

Dependability pertains to the replication of this qualitative research in other similar contexts (Ahmed, 2024). This can be ensured by documenting the research procedures and decisions made during the research process with the use of an audit trail (Kakar et al., 2023). To achieve

dependability, the qualitative study was reported following the Consolidated Criteria for Reporting Qualitative Studies checklist to ensure that the study approaches, methods for data gathering and procedures for data analysis were rigorously documented. An audit trail was also recorded for research-related decisions during the study process.

3.4.5.4 Conformity

Conformity is achieved to increase the objectivity of the qualitative findings by minimising a researcher's personal bias. Peer briefing, member checking and reflexive journaling are commonly used approaches to establish this (Ahmed, 2024; Kakar et al., 2023). In this study, independent data translation and data analysis were conducted by researcher LZ and checked by two supervisors. Any discrepancies encountered during the data translation, coding and analysis were discussed to achieve consensus. Moreover, the researcher had no contact with any of the participants before the research project. During the data collection and data analysis, the researcher remained neutral without judgemental attitudes.

3.5 Phase two: Quantitative study

3.5.1 Study design

A quantitative cross-sectional survey design was employed in phase two of the study via a self-reported questionnaire to assess the self-care behaviours and related factors of Chinese Australians with CVD and investigate their level of acculturation and its relationship with their CVD self-care practices.

3.5.2 Study participants and sampling

3.5.2.1 Recruitment criteria

Considering the much larger sample size required in phase two, the recruitment criteria were widened to include people who have lived anywhere in Australia for at least six months at recruitment without requiring Australian citizenship or permanent residency, as in phase one. Thus, in this phase, eligible participants met the following inclusion criteria: 1) adults born in Mainland China, Hong Kong, Macao or Taiwan who migrated to Australia at any stage of their

life, 2) who were residents in Australia for at least six months prior to their involvement in this study, 3) have self-reported medically diagnosed CVD, including, for example, coronary heart disease, stroke or heart failure, 4) have the ability to speak English or Mandarin, and 5) have the ability to provide informed consent; that is, those with history or evidence of impaired cognitive function were excluded.

3.5.2.2 Sampling strategy

While the same sampling strategy was employed for the phase one qualitative study, the sample of participants was newly recruited; that is, participants recruited for phase one were not eligible to participate in phase two. Purposive and snowball sampling were once again used to recruit eligible Chinese Australians with CVD between March and November 2023 via three primary sources: Chinese community associations, social media and clinic settings in areas of Sydney with a high number of people of Chinese origin. The detailed recruitment process was set out in Section 3.4.2.

In addition to the six Chinese community associations that were recruitment sites for the phase one study, the manager of the Chinese Multicultural Community in Newcastle was approached to increase the number of participants and to broaden the information provided. Managers in these Chinese community associations were requested to circulate electronic flyers (see Appendix 6) in their community WeChat groups. Meanwhile, an information session given by the researcher was held at each community centre to introduce the study to potential participants and invite them to join the research. As for the phase one study, electronic information flyers in Chinese and English were circulated via social media platforms/tools widely used by Chinese communities in Australia (i.e., WeChat and Sydney Today). Detailed information about this process is provided in Section 3.4.2. Due to the slow recruitment and low numbers, the practice manager of MyHealth medical centre in Chatswood and the cardiologists of outpatient cardiac clinics in Eastwood, Parramatta and Chatswood in Sydney were also approached to support recruitment. The flyers were displayed in the clinic waiting area, reception and consulting room. In cardiac clinics, researcher LZ was allowed to attend to hand out flyers and answer potential participants' questions about the study.

3.5.2.3 Sample size

The sample size was calculated based on the main outcomes of each research question according to published literature with similar research outcomes and the phase one qualitative findings. A simplified rule of thumb (Wilson Van Voorhis & Morgan, 2007) was applied to guide the selection of a large-enough sample size for sufficient power to examine statistical relationships. Green's comprehensive sample size formula for determining regression sample sizes (Green, 1991) specifies $N > 50 + 8m$ (where m is the number of independent variables). Based on existing relevant literature (Chun et al., 2016; Eh et al., 2016; Jin et al., 2017a) and the phase one initial findings, 19 independent variables were selected for this research stage: age, gender, residence duration, age at migration, English proficiency, education level, employment status, living status, private health insurance, CVD disease duration, place of diagnosis, use of Traditional Chinese Medicine (TCM), confidence in heart health knowledge, sources searched for CVD health information, hospital treatment, data recruitment setting and three acculturation scales. Green's sample size formula indicated that complete data from a minimum of 202 participants was required in this component of the study. Considering the potential problem of incomplete questionnaires with missing data that can affect statistical analysis, at least 253 participants were targeted based on the assumption that 25% of returned questionnaires may be incomplete. Thus, 260 participants were recruited.

3.5.3 Data collection

3.5.3.1 The instruments

The questionnaire encompassed three sections: the first collected sociodemographic and clinical data, the second assessed acculturation levels, and the third examined self-care behaviours. The questionnaire is available in Appendix 9 both in the English and Mandarin.

Sociodemographic and clinical data

Guided by literature on sociodemographic and clinical determinants of CVD self-care (Di Matteo et al., 2024; Riegel et al., 2017; Zeng et al., 2024) the following variables were selected: participants' age, gender, residence duration, English proficiency, education level, living status, employment status, Medicare access and private insurance status. Participants were asked to specify their CVD diagnosis and treatment (such as coronary heart disease, heart failure, stroke

or any CVD-related hospital admissions), the time and place of the diagnosis and whether they used TCM to manage their CVD.

Acculturation measurements

The phase one study used semi-structured interviews to explore the acculturation experiences of first-generation Chinese immigrants in Australia and the role of acculturation in relation to their CVD self-care behaviours (for more details, see Chapter 5). These findings informed the selection of acculturation scales for this phase two survey component of the study to measure the level of acculturation and its association with CVD self-care behaviours among Chinese immigrants. From the phase one coding results, the relevant domains of acculturation that were reported to impact CVD self-care of Chinese immigrants were identified. Table 3-1 was generated to map the items in the selected acculturation scales to the phase one coding results. Three acculturation scales were chosen for use in this survey study: the SL-ASIA scale, the Bicultural Efficacy in Health Management Scale (BEFF-HM scale) and the Beliefs in Traditional Chinese Medicine scale (TCM belief scale).

The SL-ASIA scale

The SL-ASIA scale is the most widely used acculturation measure for rating the acculturation level in Asian immigrant populations (Hsueh et al., 2015; Suinn et al., 1992). Although the SL-ASIA scale was closely based on the ARSMA, no theoretical model was used to develop the ARSMA scale (Thomson & Hoffman-Goetz, 2009) and no model underpinned the adaptation of the scale into the SL-ASIA scale or has since been articulated from the original paper (Suinn et al., 1987). The SL-ASIA scale was generated with characteristics to address: 1) the multidimensionality of acculturation, 2) bicultural direction, 3) the behavioural, cognitive and attitudinal domains of acculturation and 4) Asian Americans (Ponterotto et al., 1998; Suinn et al., 1987).

The original 21-item SL-ASIA scale assesses acculturation in five elements: food practices, language/media preference, ethnic social interaction, affinity for ethnic identity, and pride and generational identity (Suinn et al., 1992). The score for each item ranges from 1 to 5, and the result are presented as a mean score where higher scores indicate higher acculturation to Western culture (Hsueh et al., 2015). As the 21-item SL-ASIA scale was unidirectional, five new items were added to categorise participants bidirectionally via assessing acculturation in

domains of cultural values (two items), behavioural competency (two items) and cultural identification (one item), which enabled findings to categorise participants into four acculturation groups: Asian self-identity (separation), bicultural self-identity (integration), Western self-identity (assimilation) and neither of the cultures (marginalisation) (Hsueh et al., 2015; Liu et al., 1999; Suinn et al., 1992).

The SL-ASIA instrument was translated into the Chinese language and modified slightly in line with an Australian context. Parker et al. (2005) sampled 29 bilingual Chinese people to assess the comparability of English and Chinese versions of the SL-ASIA scale. The participants randomly completed one of the two versions of the SL-ASIA scale and then the other version one day later (a minimum interval) (Parker et al., 2005). The results demonstrated that the scores obtained using the English and Chinese versions of the SL-ASIA instrument were significantly associated (Pearson's r 0.95; $p < 0.001$), with 19 of 21 items scoring r values ranging from 0.72 to 0.97. This version of the SL-ASIA instrument translated and culturally modified for Chinese Australians has been tested and employed in studies addressing mental health considerations in Chinese Australians, which demonstrates acceptable internal consistency with Cronbach's alpha values of 0.77 (Choi et al., 2012) and 0.85 (Khawaja et al., 2016).

However, the SL-ASIA instrument has not been used specifically with first-generation Chinese Australian people with CVD. It was important to ensure that the data collection instrument used for this study was culturally sensitive to this specific population to examine the specific domains of acculturation in relation to CVD self-care behaviours among Chinese Australians. Therefore, as mentioned, the codes, themes and subthemes initially generated from phase one (qualitative interviews) were compared to the items within the SL-ASIA scale (Suinn et al., 1992) by applying the mapping table (Table 3-1).

The results indicated that the items examined in the SL-ASIA scale were congruent with the codes and themes raised in the qualitative interviews, specifically in themes of cultural practices, values and identifications. The scale was deemed appropriate for use with a first-generation Chinese Australian population with CVD and was employed in the phase two survey component of the study. Permission was granted to use the SL-ASIA scale in the English version (see Appendix 10), and the Chinese Australian version was modified by the copyright holder, Dr Bibiana Chan (see Appendix 11). The original 21-item questionnaire was tested in this sample with a Cronbach's alpha value of 0.823.

Table 3-1 The mapping table for selecting the acculturation scales

Phase one: Qualitative results		Phase two: Survey scales	
Example quotations	Categories	Subthemes	Corresponding survey items
Overarching Theme: cultural practices			Acculturation scales
<p>“In here, I also try to eat more Australian local vegetables, because they are healthier ... I also have some avocados. I know the local vegetables are very healthy ... because I never cooked them in China. But I search for online recipes sometimes and find them on my smartphone [to learn how to cook].”</p>	<p>Retain Chinese dietary practice (14)¹</p> <ul style="list-style-type: none"> • Light eating pattern (9) • Food for catering joy (5) • Heavy taste (3) • Meat stew (1) <p>Integrate Australian dietary practice (20)</p> <ul style="list-style-type: none"> • Westernised breakfast (18) • Local ingredients or diet pattern (16) • Fatty foods and sweets (3) 	<p>Dietary practice (20)</p>	<p>²SL-ASIA scale:</p> <ul style="list-style-type: none"> • What is your food preference at home? • What is your food preference in restaurants? <p>³BEFF-HM scale:</p> <ul style="list-style-type: none"> • How sure are you that you can deal with unfamiliar Australian foods?
<p>“I only started searching for this [heart health information] after I came to Australia. I cannot read English. My only language is Chinese. So, I can only check WeChat and our Chinese newspaper.”</p>	<p>Accessing the healthcare system (19)</p> <p>Seek heart health information (19)</p> <ul style="list-style-type: none"> • Search Chinese-sourced information (16) • Search Australian-sourced information (1) 	<p>Language use and media preference (20)</p>	<p>SL-ASIA scale:</p> <ul style="list-style-type: none"> • What language can you speak? • What language do you prefer? • Do you read (in English, Chinese or Both)? • Do you write (in English, Chinese or Both)? • What is your music preference? • What is your movie preference? <p>BEFF-HM scale:</p> <ul style="list-style-type: none"> • How sure are you that you can cope with situations in

Phase one: Qualitative results		Phase two: Survey scales	
Example quotations	Categories	Subthemes	Corresponding survey items
<p>“Almost every day, I tried to make myself available every day [at Chinese community centre]. It feels lonely being here. We, old people, do not speak any English, and we know nothing here. So, I feel there is a need for me to adapt to the environment here [in Australia], [if] you live here. I have no choice. So, I only can go out every day and participate in all sorts of activities [at Chinese community centre], even though I had never tried them before ... Now, I have learnt tai-chi here, dancing and singing here.”</p>	<p>Retain Chinese network (12) <ul style="list-style-type: none"> • Establish community ties (12) • Maintain oversea ties (5) Integrate Australian network (1) <ul style="list-style-type: none"> • Make native friends (1) </p>	<p>Social networks (13)</p>	<p>SL-ASIA scale:</p> <ul style="list-style-type: none"> • What was the ethnic origin of the friends and peers you had, as a child up to age 6? • What was the ethnic origin of the friends and peers you had, as a child from 6 to 18? • Whom do you now associate within the community? • If you could pick, whom would you prefer to associate within the community? • Rate yourself on how well you fit when with other Chinese of the same ethnicity. • Rate yourself on how well you fit when with other Australians who are non-Chinese (Westerners).
<p>“I only drink a small amount to celebrate special occasions like Chinese New Year. I do not drink usually.”</p>	<p>Celebrate Chinese festival (1)</p>	<p>Festival celebration (1)</p>	<p>SL-ASIA scale:</p> <ul style="list-style-type: none"> • Do you participate in Chinese occasions, holidays, traditions, etc.?
Overarching Theme: Cultural values			Acculturation scales
<p>“They [adult children] are very supportive and happy to make changes to accommodate my needs. They encourage me to eat less salt, sugar, and meat. Like me, they enjoy fruits and vegetables. They are still young, in their 40s, so they are not keen to eat too much red meat as well.”</p>	<p>Retaining traditional family ties (18) <ul style="list-style-type: none"> • Filial piety expectation (15) • Collectivism (15) • Gender role (10) </p>	<p>Family relationship (18)</p>	<p>SL-ASIA scale:</p> <ul style="list-style-type: none"> • Rate yourself on how much you believe in Chinese or Asian values (e.g., about marriage, families, education, work). • Rate yourself on how much you believe in Western values.

Phase one: Qualitative results		Phase two: Survey scales	
Example quotations	Categories	Subthemes	Corresponding survey items
	Integrating into individualism (4)		BEFF-HM scale: <ul style="list-style-type: none"> • How sure are you that you can have family closeness and interpersonal warmth in your daily life? • How sure are you that you can maintain close ties and relationships in your family? • How sure are you that you can deal with family expectations and obligations?
"I am doing reasonably well in this regard [stress management]. I have to learn to let go and not be bothered by things that are beyond my control so that when unhappy things happen, I can just shake it off."	Retain Chinese values (14) <ul style="list-style-type: none"> • Reserved emotion (4) • Tolerance to pain (3) • Traditional philosophies (9) 	Traditional values (18)	SL-ASIA scale: <ul style="list-style-type: none"> • Rate yourself on how much you believe in Chinese or Asian values (e.g., about marriage, families, education, work). • Rate yourself on how much you believe in Western values.
Overarching Theme: Cultural identification		Acculturation scales	
"In China when my parents were sick, I took them to Beijing and Shanghai and looked for doctors in all the major hospitals. I had to find out information about where to go, how to get there, and who I should contact. I did not find it difficult at all. I was quite capable of doing all that. When I came here, I became like [Laughing] Anyway, I just feel all my strengths are wasted here, like I am useless."	Retain Chinese culture (1)	Cultural belongings (1)	SL-ASIA scale: <ul style="list-style-type: none"> • There are many different ways in which people think of themselves. Which ONE of the following most closely describes how you view yourself? • If you consider yourself a member of the Chinese

Phase one: Qualitative results		Phase two: Survey scales	
Example quotations	Categories	Subthemes	Corresponding survey items
Overarching Theme: Healthcare system utilisation			
“...So the doctor asked me to continue taking the medication. [If something happens] I would like to talk with my doctor about medications and follow his instructions. Because they are health professional.”	Decision-making involvement (6) Respect authority prestige (9)	Patient and doctor interactions (9)	<p>BEFF-HM scale:</p> <ul style="list-style-type: none"> • How sure are you that you can communicate your health concerns with your doctor? • How sure are you that you can understand your doctor’s medical advice and health recommendations?
“My GP still said I have diabetes. So, he referred me to a dietitian in XX [location]. He knew that dietitians here ... in Australia, my doctors care about me after I was diagnosed, no matter it is my heart disease or diabetes. They tell me when to have a repeat test or a follow-up appointment. All of these are very thoughtful and feel very caring to me. Getting such experiences is not possible in China. The doctors do not actively seek to help you.”	Adapting the new healthcare system (10) <ul style="list-style-type: none"> • Healthcare service access (7) • Service quality satisfaction (9) Difficulties in new healthcare system (6)	Medical service navigation (13)	<p>BEFF-HM scale:</p> <ul style="list-style-type: none"> • How sure are you that you can schedule an appointment with a doctor? • How sure are you that you can receive the health care that you need?
“The Chinese medicine seems to have some therapeutic effects on me. I do not get that stuffy feeling in my heart anymore when I go to bed at night... In the end, I believe	TCM belief and practices (11)	Traditional Chinese	<p>⁴TCM belief scale:</p> <ul style="list-style-type: none"> • Compared with Western medicine, TCM is more

Phase one: Qualitative results		Phase two: Survey scales	
Example quotations	Categories	Subthemes	Corresponding survey items
traditional Chinese medicine has helped me to recover. I was feeling really unwell before. But now I feel better and I no longer get palpitations."		Medicine (TCM) (11)	<p>effective for longstanding diseases.</p> <ul style="list-style-type: none"> • TCM treats the cause of illness. • Compared with Western medicine, TCM has fewer side effects. • Compared with Western medicine, TCM causes fewer digestive side effects. • TCM can cure diseases. • TCM can promote health. • TCM has a restorative effect that can promote health over time. • TCM can improve one's constitution.

Note: ¹The number in the bracket indicates the number of participants reported the subtheme or category, 20 participants in total; ²SL-ASIA scale: Suinn-Lew Asian Self-Identity Acculturation scale; ³BEFF-HM scale: Bicultural efficacy in health management scale; ⁴TCM belief scale: Traditional Chinese Medicine belief scale.

The BEFF-HM scale

The BEFF-HM scale was developed to identify and evaluate the most relevant domains of acculturation and bicultural skills that Chinese American immigrants perceived as important to managing their health (Chun et al., 2011, 2016). The BEFF-HM scale assesses how confident Chinese immigrants feel about coping with acculturation challenges to manage their health issues in a cross-cultural context (Chesla et al., 2013). The 10-item scale includes three acculturation domains: maintaining family and social relations in the US, using the healthcare system in the US and dealing with new language and lifestyle in the US, with each item rated from 1 (not at all sure) to 4 (very sure). The items were summed (from 10 to 40), with higher scores designating higher bicultural self-efficacy in coping with acculturation stress related to health management (Chesla et al., 2013). The BEFF-HM scale was tested on 162 Chinese American immigrants with type 2 diabetes to assess their confidence in coping with acculturation challenges to managing their diabetes (Chun et al., 2016). The scale demonstrated good psychometric properties in this study with an internal reliability standardised alpha value of 0.80 and significant variance ($p < 0.001$).

This scale had not been used with first-generation Chinese Australian people with CVD. The items within the BEFF-HM scale were mapped with the codes, themes and subthemes initially generated from phase one qualitative interviews (Table 3-1). The results indicated that items in the BEFF-HM scale were all covered in the codes and themes generated in the qualitative interviews. Particularly, the essential domain of acculturation, healthcare system utilisation, was assessed in the BEFF-HM scale but missed in the SL-ASIA scale. Thus, the scale was selected for the phase two survey study. Permission was received from the copyright holder to use the scale in the English version (see Appendix 12).

Originally developed in the US, each domain was tailored to that context, so the instrument was modified by changing the wording to fit the Australian context. Considering the limited time, financial and personnel resources for employing back translation, forward translation was conducted on the BEFF-HM scale (Maneesriwongul & Dixon, 2004). The scale was first translated from English into Chinese by the researcher (LZ), an accredited professional translator in Australia. The translated version was verified by another bilingual researcher (XX, one of the supervisors), with no discrepancies identified. The scale was validated in this study sample with a Cronbach's alpha value of 0.807, which indicates adequate internal reliability.

The TCM belief scale

According to the mapping results (Table 3-1), another acculturation domain that emerged from the phase one qualitative data related to participants' beliefs in TCM; this was not covered in the SL-ASIA and BEFF-HM scales. The TCM belief scale was selected because the variables examined in the scale were echoed within the theme of TCM beliefs generated in the phase one study.

The TCM belief scale was a subscale of the Chinese-Western Medical Belief Scale that addressed attitudes towards the effectiveness and safety of TCM (Bishop et al., 2009). This 8-item questionnaire was scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The scores were summed and weighted by the number of items, with a higher score indicating a stronger belief in TCM. This scale has demonstrated reliability with Cronbach's alpha values of 0.87 and 0.85 among Chinese overseas students and Chinese immigrants with diabetes in Australia, respectively (Bishop et al., 2009; Eh et al., 2016).

This scale was appropriate for use within a Chinese Australian population with CVD and was employed in the phase two survey component of the study. Conducting forward translation (Maneesriwongul & Dixon, 2004), as for the BEFF-HM scale, the TCM belief scale was translated into Chinese by the researcher and verified by the bilingual supervisor with no discrepancies identified. The scale was validated in this study sample with a Cronbach's alpha value of 0.904, which indicates adequate internal reliability. Permission to use this scale was granted by the copyright holder (see Appendix 13).

Self-care behaviours measurements

Self-care behaviours were assessed with the SC-CHDI version 3.0 (Dickson et al., 2023; Vaughan Dickson et al., 2017), available online at <https://self-care-measures.com/>. This scale was developed based upon the Middle-Range Theory of Self-Care of Chronic Illness to target populations with coronary heart disease (Vaughan Dickson et al., 2017). As suggested by the scale developer, the SC-CHDI is also suitable for participants with other cardiovascular diseases, such as stroke and heart failure.

The 23-item questionnaire covers three subscales including self-care maintenance (behaviours performed to stabilise the disease progress), self-care monitoring (practices conducted to observe body signs and symptom changes) and self-care management (action taken when

symptoms occur) (Dickson et al., 2023; Vaughan Dickson et al., 2017). Each item is scored with a five-point scale ranging from 1 to 5 to allow participants to rate how routinely or likely they are to practice these listed self-care behaviours. Each subscale score is the sum of the subscale responses; the score of each subscale is calculated separately without adding together the three subscale scores. The summed subscale scores are then transformed into standardised scores (ranging from 0 to 100). A threshold score of ≥ 70 has been commonly accepted in the literature to indicate an 'adequate' level of self-care (Dickson et al., 2023; Di Matteo et al., 2024; Riegel et al., 2009; Vaughan Dickson et al., 2017). This scale has been validated in European populations with Cronbach's alpha values ≥ 0.80 for all subscales (Dickson et al., 2023) and in the Thai population with Cronbach's alpha and McDonald's omega values for each subscale > 0.80 (Koson et al., 2023). The permission to use both English and Chinese versions of the SC-CHDI version 3.0 was obtained from the scale developer (see Appendix 14).

The SC-CHDI version 3.0 scale had not previously been used with first-generation Chinese Australian people with CVD. It was important to ensure that the data collection instrument used for the study was culturally sensitive to this specific population to examine the relationship between acculturation and self-care behaviours among Chinese Australians with CVD. Thus, the SC-CHDI was examined based on the coding results derived from the phase one interview component of this study. A table was created to map the components of the validated form of the SC-CHDI to the interview codes, themes and subthemes (Table 3-2). All current SC-CHDI items were congruent with qualitative findings, but two factors did not feature in the questionnaire. It has been demonstrated that sleep duration and quality are significantly associated with CVD outcomes, and having good-quality sleep can support prevention and treatment of CVD (Jaspan et al., 2024). Acknowledging and avoiding the common triggers of angina or cardiac symptoms, such as physical exertion, cold temperature and heavy meals, are also important self-care practices for stabilising CVD conditions and helping prevent the recurrence of cardiac symptoms and events (Ruane et al., 2018; Tofler et al., 2013; N.Zhang et al., 2023). Thus, two items, "Make sure to get good rest (e.g., sleep well at night, nap during the day)" and "Avoid triggers that may worsen your heart problem (e.g., physical exertion, cold weather, tiredness)", were added to the self-care maintenance subscale to ensure that the measure was culturally sensitive for this population. The Cronbach's alpha value of the original self-care maintenance subscale for this sample was 0.617 and improved to 0.663 after adding the two items. The Cronbach's alpha values of the self-care monitoring subscale were 0.830 and 0.468 for the self-care management subscale.

Additional questions

Two questions probing participants' CVD health knowledge and their behaviours in searching for CVD health information were created for this study based on the findings from the phase one qualitative component of this study. Specifically, in the phase one study, some Chinese participants manifested poor confidence in their CVD-related health knowledge and expressed a strong desire to receive CVD health education. Most participants searched for CVD-related health information from Chinese websites and networks, and they attributed their decision to target these sources to their poor access to mainstream Australian health information. Strong evidence supports that health knowledge significantly influences CVD self-care behaviours, and searching for disease-related health information is one of the important self-care behaviours for individuals living with CVD (Riegel et al., 2017; Zhang et al., 2018). Thus, adding these two questions could further expand the understanding of the self-care behaviours of this population. A further open-ended question was developed that invited participants to provide detailed and individualised answers. This would complement the questionnaire findings and gain a greater understanding of the studied population. The question asked at the end of the survey was: "Is there anything else about how you look after your heart health (or stroke) that you would like to tell me?"

3.5.3.2 Data collection procedures

Participants had a choice of ways to complete the questionnaire. Participants recruited using social media could complete it digitally using the link provided in the electronic recruitment flyer to the questionnaire hosted on a REDCap database. Before completing the questionnaire, eligible participants were instructed to read the participant information sheet (available in both English and Chinese) attached to the first page of the electronic questionnaire to ensure that they were well informed about the study. Filling out and submitting the questionnaire was taken to indicate participants' consent to take part in this study.

Participants recruited from Chinese community associations were offered a paper copy of the questionnaire onsite during the information session or they could complete it verbally via telephone with the researcher at a later agreed date and time. In the cardiac clinics, both a paper copy of the questionnaire and the online version were available for participants to self-complete. If preferred, participants could complete the questionnaire with researcher LZ to read the items and fill in their responses onsite. LZ explained the research to these participants in person onsite

or via telephone, in which case they provided recorded verbal consent to complete the questionnaire.

3.5.4 Data analysis

The questionnaire data were cleaned in Excel, which involved deleting empty or ineligible cases and formatting the data, which were then imported into the software SPSS version 26 for statistical analysis. Cases with missing data were excluded from statistical analysis unless guided by scale instructions (i.e., SC-CHDI version 3.0). Descriptive and inferential statistics were used to address the four research questions.

First, descriptive statistics were conducted to depict the sample's sociodemographic and clinical characteristics. Mean and standard deviation were used to describe normally distributed continuous variables (e.g., age), while number and percentage were supplied to describe categorical variables (e.g., gender, marital status, etc.) (Polit & Polit, 2010, pp. 19–58). Gender-specific sociodemographic and clinical characteristics were summarised and compared to detail the sampled population. Gender-specific continuous sociodemographic and clinical variables were examined using histograms for normal distribution, and t-tests were conducted to examine any statistical differences between female and male groups (Knapp, 2017, pp. 98–107) after checking for homogeneity of variance. Chi-square tests were conducted to compare the differences in categorical variables between the two groups (Knapp, 2017, pp. 218–230). For all tests, the significance level was $p < 0.05$.

To address research question 1 (asking what self-care behaviours are practised by Chinese immigrants with CVD in Australia), descriptive statistics were used to depict the self-care behavioural characteristics of the sample. Mean and standard deviation were used to describe each CVD self-care subscale. A threshold score of ≥ 70 out of 100, commonly used in the relevant literature (Cao et al., 2019; Dickson et al., 2023; Di Matteo et al., 2024), was applied to indicate an 'adequate' level of self-care. To describe the distribution of adequate CVD self-care behaviours among the sample, numbers and percentages were provided.

Table 3-2 The mapping table comparing interview and Self-Care of Coronary Heart Disease Inventory variables

Phase one: Qualitative results		Phase two: Survey instrument	
Example quotations	Categories	Subthemes	Corresponding survey items
Overarching theme: Self-care maintenance			Self-Care of Coronary Heart Disease Inventory: Self-care maintenance subscale (adding two items)
"I see my specialist at least once every year. I have an exercise stress test annually when I go to see my specialist."	<ul style="list-style-type: none"> • See general practitioners (16)¹ • Follow-up cardiac specialists (20) • Access allied health services (9) 	Medical follow-ups (20)	<ul style="list-style-type: none"> • Keep appointments with your healthcare provider?
"I never stop taking the medications. I always take them. For the past 5 years, I have always been on the medications I got in Australia."	<ul style="list-style-type: none"> • Adherence to prescribed Western medication (19) • Use of Traditional Chinese Medicine (20) • Self-administration of Health supplements (11) 	Medication adherence (20)	<ul style="list-style-type: none"> • Take aspirin or other blood thinner? • Take prescribed medicines without missing a dose?
"I am not used to ... managing the ... personal emotion or stress, I do nothing about it. I do not have a better way [to manage the stress], so I do not ... think that much."	<ul style="list-style-type: none"> • Seek professional support (3) • Self-adjustment (15) • Self-tolerate (3) • Social support (5) 	Stress management (20)	<ul style="list-style-type: none"> • Do something to relieve stress (e.g. medication, yoga, music)?
"Everyday. But his [doctor] recommendation was daily walk, while I walk maybe ... 4, 5 days, 5, 6 days a week, not equal. It varies ... But normally, I manage to walk 3 to 5 km every day."	<ul style="list-style-type: none"> • Developing exercise routines (17) • Limiting exercise or maintaining physical inactivity (13) 	Physical activities (20)	<ul style="list-style-type: none"> • Do physical activity (e.g., take a brisk walk, use the stairs)?

Phase one: Qualitative results		Phase two: Survey instrument	
Example quotations	Categories	Subthemes	Corresponding survey items
"I control how much red meat I eat and try to cut back on it. Likewise, I try to avoid high-sugar foods as much as possible. Instead, I eat more vegetables and fruits, as well as soy products like soy milk."	<ul style="list-style-type: none"> • Adopt some heart-healthy diet (13) • Maintain some poor preference (10) • Retain healthy eating habits (8) 	Dietary practices (20)	<ul style="list-style-type: none"> • Eat fruits and vegetables? • Ask for low fat items when eating out or visiting others?
"I have flu vaccination every year. Because my doctor said: 'you have heart disease so don't risk yourself to catch a flu. Whenever you catch a cold or flu, it will damage your heart.' ... I have flu vaccination and osteoporosis injection regularly to maintain my health."	<ul style="list-style-type: none"> • Attend regular vaccination (13) • No vaccination compliance (4) 	Flu vaccination (17)	<ul style="list-style-type: none"> • Try to avoid getting sick (e.g., flu shot, wash your hands)?
"I have ... Um ... I have a bad habit, smoking. My doctor asked me to stop, but I ... I have been a smoker for almost 30 years and now I was suddenly being asked to quit. I do not think I can adjust to it at all."	<ul style="list-style-type: none"> • Keep smoking (2) 	Smoking behaviours (2)	<ul style="list-style-type: none"> • Avoid cigarettes and/or smokers?
"I do not sleep very well, because it is difficult for me to fall back asleep after waking up in the middle of the night."	<ul style="list-style-type: none"> • Good sleep (6) • Poor sleep (12) • Taking midday nap (10) 	Sleep and rest patterns (18)	<ul style="list-style-type: none"> • ²Make sure to get good rest (e.g., sleep well at night, nap during the day)?
"I am more careful about the possible triggers. I try to avoid straining when I go to the toilet. And I try not to squat down. If I have to, I use a small stool to help me. Those are the measures I take to prevent the episodes from happening."	<ul style="list-style-type: none"> • Adapt temperature change (1) • Decrease workload (3) • Keep hydrated (2) • Reduce physical exertion (4) 	Trigger avoidance (7)	<ul style="list-style-type: none"> • ³Avoid triggers that may worsen your heart problem (e.g., physical exertion, cold weather, tiredness)?

Phase one: Qualitative results		Phase two: Survey instrument	
Example quotations	Categories	Subthemes	Corresponding survey items
Overarching Theme: Self-care monitoring			Self-Care of Coronary Heart Disease Inventory: Self-care monitoring subscale
"There was a time when I ... my left shoulder ... I experienced some aches and pains in my left shoulder. So, I went to see my GP to check. He said it was not related to the heart or lungs, but something else. He told me not to worry about it."	<ul style="list-style-type: none"> • Typical symptoms (16) • Atypical symptoms (5) 	Interpreting bodily symptoms (18)	<ul style="list-style-type: none"> • Monitor your condition? • Pay attention to changes in how you feel? • Monitor whether you tire more than usual doing normal activities? • Monitor for symptoms?
"Basically, I used to check my blood pressure every two or three days. Now I check it every one or two weeks."	<ul style="list-style-type: none"> • Check regular (14) • Check with presenting symptoms (4) • No check (3) 	Checking bodily signs (15)	<ul style="list-style-type: none"> • Check your blood pressure? • Monitor your weight?
"After I had been on warfarin treatment for a couple of years, I had some side effects from the warfarin diet that I rarely ate green foods. I started being cautious that I can't just avoid green foods at all."	<ul style="list-style-type: none"> • Medication effectiveness (4) • Medication side effects (10) 	Monitoring medication (13)	<ul style="list-style-type: none"> • Monitor for medication side effects?
Overarching Theme: self-care management			Self-Care of Coronary Heart Disease Inventory Self-care management subscale
"I will drink some water and lie down or sit down. I will wait and see whether it goes away. If it [angina] does not get better, I will have medications, either the Jiuxin Wan or Danxindi Wan [traditional Chinese medicines]."	<ul style="list-style-type: none"> • Stopping for taking a rest (11) • Self-medication (10) • Access medical service (8) • Tell doctors at the next follow-up (2) • Tell someone (2) • No action (5) 	Heart symptoms management (17)	<ul style="list-style-type: none"> • Change your activity level (slow down, rest). • Take an aspirin. • Take a medicine to make the symptom decrease or go away. • Call your healthcare provider for guidance. • Tell your healthcare provider about the symptom at the next office visit.

Phase one: Qualitative results			Phase two: Survey instrument
Example quotations	Categories	Subthemes	Corresponding survey items
			<ul style="list-style-type: none"> • Did the treatment you used make you feel better?

Note: ¹The number in the bracket indicates the number of participants reported the subtheme or category, 20 participants in total. ^{2&3}New items added to the original Self-Care of Coronary Heart Disease Inventory Subscale.

Text responses to the open-ended question asking about their experiences with CVD self-care were de-identified to ensure participants' confidentiality and exported into a Microsoft Word file (chosen for simplicity, as this was a small sample of data). The responses from 25 participants were translated into English independently by the researcher (LZ), an accredited professional translator. The translated data were independently checked by the co-supervisor (XX, a bilingual researcher) with no discrepancy found (Twinn, 1997). Deductive thematic analysis was employed (Clarke & Braun, 2017) with a predetermined list of codes informed by the Middle-Range Theory of Self-Care of Chronic Illness and the survey questions. The coding process has been presented in Appendix 15.

To address research question 2 (asking what factors are associated with CVD self-care), linear regression modelling was selected to test the relationships between one or more independent variables and a continuous dependent variable (Knapp, 2017, pp. 181–216). The assumptions for linear regression were tested: all continuous independent and dependent variables relevant to this research question were checked for distribution normality using a histogram; linearity and homoscedasticity were checked using scatterplot graphs. All assumptions were met, and univariate and multivariable linear regression modelling was applied to address research question two. Categorical independent variables were converted into dummy variables (Polit & Polit, 2010, pp. 236–237). Univariate linear regression, with coefficients and a 95% confidence interval (95% CI), was computed to examine each self-care subscale score in relation to each independent variable. All sociodemographic and clinical variables were entered into a multivariable linear regression model at once with a backward elimination method (significance set at $p < 0.05$) to identify factors significantly associated with CVD self-care. This method removed the non-significant or least important variables at an early stage to retain the most significant factors related to CVD self-care in the model (Chowdhury & Turin, 2020).

To address research question 3 (asking about their acculturation experiences), descriptive statistics were used to summarise acculturation characteristics. Mean and standard deviation were used to describe continuous variables (e.g., age at migration, residence duration and the SL-ASIA, BEFF-HM and TCM belief scales). Numbers and percentages were supplied to describe categorical variables (e.g., English proficiency) (Polit & Polit, 2010, pp. 19–58).

To address research question 4 (asking how Chinese Australians' unique acculturation experiences impact their CVD self-care practices), the same statistical tests were selected for research question two. After checking that all assumptions for linear regression were met, univariate and multivariable linear regression modelling was applied. Initially, univariate linear

regression, which provided coefficients and a 95% CI, was conducted to investigate the self-care subscale score associated with each independent acculturation variable. All sociodemographic, clinical and acculturation variables were entered into a multivariable linear regression model simultaneously to examine the relationship between measures of acculturation and CVD self-care, which were adjusted for sociodemographic, clinical and other acculturation variables that were potentially confounding.

3.6 Data integration

According to Creswell's guideline (2018), in this exploratory sequential design, data integration occurred at two points (Figure 3-1).

First, following the qualitative phase of data analysis, the codes and themes grounded in the CVD self-care practices and acculturation experiences of Chinese Australians were used to match the variables within two existing instruments: the SC-CHDI version 3.0 and the SL-ASIA scale. This was undertaken to determine whether these tools were appropriate, adequate and culturally sensitive for use with Chinese Australians. As this procedure indicated that these tools were appropriate for use with the study population, the SC-CHDI and SL-ASIA scales were applied in the survey component of the study. Further scales, the BEFF-HM and the TCM belief scales, were also selected in light of the qualitative findings. The codes and themes deriving from the phase one interview data and the elements and variables derived from the phase two questionnaires were jointly displayed in mapping tables as part of the integration process (Guetterman et al., 2015) (Tables 3-1 and 3-2).

The second point of data integration occurred when the two datasets generated from the phase one qualitative study and the phase two survey study were brought together for analysis to answer the research questions (Fetters et al., 2013). Qualitative data provided in-depth understanding by exploring and explaining the phenomenon, while quantitative data generalised the characteristics and demonstrated the statistical relationships between acculturation and CVD self-care. The main qualitative and quantitative findings of each research question were listed in a joint display to gain new insights beyond the information generated from the qualitative and quantitative studies separately (Guetterman et al., 2015). The two datasets were compared for the coherence or fit of the qualitative and quantitative findings and synthesised narratively to draw conclusions and answer each research question.

3.7 Ethical considerations

The study was approved by the Human Research Ethics Committee at the University of Technology Sydney (UTS) with reference number ETH21-6096 (see Appendix 16). Three amendments were submitted and approved by the committee to widen the inclusion criteria and add extra recruitment sites in Chinese community associations, medical centres and cardiac clinics for the phase two survey component of the study (see Appendix 16).

Several specific ethical considerations were pertinent to this study: the voluntary nature of study participation, privacy and confidentiality and potential harm.

3.7.1 The voluntary nature of study participation

In line with the then-current National Statement of Ethical Conduct in Human Research (National Health and Medical Research Council, 2018), participants were recognised as autonomous decision-makers, and their participation in research was acknowledged as a voluntary right. Consequently, study participants were required to have the cognitive capacity to supply informed consent. In this study, participants were screened to determine that they met the study recruitment criteria. Those with any history or evidence of impaired cognitive function were ineligible to participate.

To uphold participants' autonomy, the information sheet was distributed to potential participants to ensure that they were informed about the research and had time to consider participation (Woods & Lakeman, 2014, pp. 35–45). The information sheet was produced in two versions, English and Chinese, so that participants could choose their preferred language (see Appendix 7). The research team members had no previous relationship with participants, and participants were not put under any pressure or coerced to participate in this research.

To address a potential power imbalance between researchers and participants, the researcher LZ clearly explained the research aim and introduced the researcher's background and position to participants at the beginning of each interview to generate a warm and comfortable environment to support the development of rapport. The researcher's non-judgemental attitude was also clearly explained to participants to build a sympathetic relationship. Participants were encouraged to ask questions during the interview process (Anyan, 2013).

3.7.2 Privacy and confidentiality

In the process of data collection and analysis, participants were asked not to use any language that might make them identifiable, and where this occurred, it was subsequently omitted from the transcripts so that they were de-identified (Woods & Lakeman, 2014, pp. 35–45). Files containing the audio-recorded and transcribed interview data were identified by a study identity number. The codes were linked to participants' personal information in a separate file. Code numbers were used to de-identify the participants in the survey study. These files were stored and managed in accordance with UTS data management procedures (UTS, 2021). Digital files, interview transcripts and audio recordings were saved in the UTS OneDrive, which is restricted by password access.

3.7.3 Potential harm

The in-depth interview could potentially evoke some degree of emotional distress in participants when recalling their past experiences, and it was acknowledged that this might have the potential to undermine their emotional well-being (Lowes & Paul, 2006). Apart from any potential emotional stress related to personal behaviours and CVD survival experiences, another potential risk for this immigrant population was that the interview might trigger the recall of some aspect of their former lives regarding cultural values and practices that may result in distress. While no more than minor distress was anticipated, to uphold the principle of non-maleficence (NHMRC, 2018), several strategies were proposed to minimise the risk of psychological harm to these Chinese Australian participants. Before the interview, participants were notified that they had the right to stop the interview at any time if they experienced any emotional distress. For participants experiencing distress, researcher LZ (the data collector) would offer to contact a general practitioner for professional support, with the participants' consent. Alternatively, the researcher referred participants to reliable and free mental health services in the language they preferred, such as Lifeline and Transcultural Mental Health. These were also listed in the information consent form (see Appendix 7).

3.8 Data management

Research data were stored and managed in line with UTS data management procedures (UTS, 2021). At the beginning of the research project, the researcher (LZ) created a research data management plan (RDMP) in the Stash platform and requested a workspace for secure data storage (see Appendix 17). Once the digital data (transcript data, researcher notes and discussion records and audio recordings) were saved in the Microsoft 365 UTS OneDrive and a UTS-allocated laptop with access restricted by password; audio recordings were deleted from two portable recorders (an app on a smartphone and a digital voice recorder). For hard copy data (e.g., field notes), the original versions were scanned and saved in the UTS-OneDrive via the UTS-allocated laptop, and the paper copies were subsequently shredded and discarded. At the end of the project, all digital datasets will be archived in Stash for five years and then electronically deleted.

3.9 Chapter summary

This chapter has provided an outline of the mixed method design for this PhD project. After introducing the theoretical frameworks used in this project, qualitative and quantitative methods were detailed separately, including the study participants and sampling, data collection and analysis. The strategies for integrating two datasets at two points were explained to address the four research questions. Ethical considerations and data management have been set out.

Chapter 4 Phase One Qualitative Results: Self-care Behaviours, Perceived Barriers and Enablers

4.1 Chapter introduction

This chapter reported findings from the phase one qualitative study which aimed to demonstrate the CVD self-care behaviours of first-generation Chinese immigrants in Australia and identify facilitators and barriers to their CVD self-care behaviours through interviews. These findings addressed the following objectives of this thesis:

1. To conduct preliminary individual interviews to demonstrate the self-care behaviours among Chinese Australians living with CVD.
2. To conduct preliminary individual interviews to identify factors impacting their CVD self-care behaviours.

This chapter is based on a paper which was published in the *Journal of Advanced Nursing* with open access in 2024. The content of this paper is reproduced in this chapter with permission under the Creative Commons Attribution Non-Commercial No-Derivatives license (CC BY-NC-ND 4.0). The published paper is available in Appendix 18. The paper can be referenced as:

Zeng, L., Xu, X. & Perry, L. (2024). Self-care behaviours of first-generation Chinese immigrants living with cardiovascular disease: A qualitative study. *Journal of Advanced Nursing*, 81(2), 1038–1051. <https://doi.org/10.1111/jan.16302>

4.2 Abstract

Aim: To identify and describe self-care behaviours performed by Chinese immigrants living with cardiovascular disease in Australia and factors perceived as barriers and facilitators to evidence-based cardiac self-care.

Design: A qualitative descriptive design.

Methods: Individual semi-structured phone interviews were conducted among participants meeting the following criteria: 1) first-generation Chinese immigrants to Australia, born in Mainland China, Hong Kong, Macao or Taiwan; 2) Australian permanent residents or citizens; 3)

self-reported or medically diagnosed with coronary heart disease, stroke or heart failure; 4) able to speak English or Mandarin; 5) able to provide informed consent, excluding those with history or evidence of impaired cognition such as dementia. Participants were recruited via social media, Chinese community associations and medical centres from September 2021 to June 2022. Data were analysed using inductive and deductive thematic analysis, guided by the Middle-Range Theory of Self-Care of Chronic Illness. The study was reported in line with the COREQ checklist.

Results: Twenty participants were interviewed, 60% female, mean age 69.9 years. Most migrated to Australia at an older age following their retirement in China; most had limited English proficiency. Many practised adequate self-care for their CVD in self-care maintenance and monitoring. Variously, they adopted heart-healthy diets, developed exercise routines, attended medical services, and closely monitored their body signs and symptoms. However, self-adjusting medications, taking Traditional Chinese Medicine and self-administering health supplements were prevalent practices and first-response management of acute cardiac symptoms was suboptimal. Linguistic and cultural barriers to obtaining mainstream heart health information meant most participants resorted to informal, anecdotal and mainland Chinese sources.

Conclusion: Diverse factors were held responsible for sub-optimal self-care behaviours but lack of access to linguistically and culturally appropriate heart health information was widely blamed. Linguistically and culturally appropriate community-based heart health education programs are urgently needed, targeting healthy lifestyle modification, medication literacy and cardiac symptom management.

Impact: Study findings can be used to improve cardiac nurses' cultural sensitivity and practices targeting Chinese immigrants. Partnering with Chinese community associations offers health service providers and policymakers an innovative route to co-design and deliver targeted heart health education interventions and support for this population.

Public contribution: Chinese community centre managers contributed to data collection by supporting participant recruitment.

Keywords: cardiovascular disease, Chinese immigrants, chronic disease management, health behaviour, self-care

What does this paper contribute to the wider global clinical community?

- This paper provides insight into the self-care behaviours of Chinese immigrants living with cardiovascular disease in a Western country, which can advance cardiac health practitioners' cultural knowledge and practices in caring for this population.
- Findings indicate that health service providers, particularly nurses, should collaborate with Chinese community associations to co-design and deliver community-based culturally responsive and linguistically accessible heart health information and education programs to upskill Chinese immigrants' cardiac self-care behaviours which may help mitigate the health disparities experienced by this immigrant population.

4.3 Introduction

Cardiovascular disease (CVD) refers to a variety of heart and vascular problems and is the leading cause of mortality globally (World Health Organization, 2021). In Australia, CVD accounted for 25% of all deaths and 600,000 hospitalisations in 2021 (Australian Institute of Health and Welfare, 2024). However, it poses a disproportionate burden on immigrants compared to host populations, resulting in CVD health disparities in immigrant populations (Agyemang & van den Born, 2022). Self-care is crucial in reducing cardiovascular morbidity and mortality (Riegel et al., 2017). As the concept of self-care developed, the Middle-Range Theory of Self-Care of Chronic Illness was elucidated (Riegel et al., 2012), encompassing three core domains: self-care maintenance, self-care monitoring and self-care management. Self-care maintenance comprises behaviours performed to stabilise the illness process or maintain health status, such as healthy lifestyle adaptation and medication adherence. Self-care monitoring refers to activities for recognising and observing body changes, such as measuring blood pressure. Self-care management entails patients' evaluation of the treatment and their response to changed body signs and symptoms (Riegel et al., 2012). However, it can pose challenges for immigrants as they navigate a newly adopted healthcare system with attendant language and cultural barriers.

Chinese immigrants, as a subgroup of the migratory population, present one of the largest and fastest-growing global immigrant groups (Gong & Zhao, 2016). The Western countries where the largest numbers of Chinese people have migrated include the United States of America, Canada, Australia, New Zealand, and the United Kingdom (Li et al., 2018). In Australia, the Chinese immigrant population has grown rapidly since 2006, and by 2021 was the third-largest overseas-born migrant group (Australian Bureau of Statistics, 2022). In the same year in the United States of America, this population was the largest Asian immigrant group, with 5.2 million people (United States Census Bureau, 2023). Notably, in recent years, many Chinese people have

relocated to Western countries at relatively older ages through the sponsorship of adult children who migrated first. These first-generation Chinese immigrants (those born in China who migrate to a host country) have different experiences from second and subsequent-generation Chinese immigrants (the children of first or subsequent-generation migrants, who were born in the host country) as life-long exposure to the host culture will have significantly impacted their level of acculturation within this country, for example in terms of language proficiency, cultural health beliefs and lifestyle. Similarly, Chinese acculturation to the host country for immigrants of mixed rather than unitary ethnic backgrounds may be a more complex matter in terms of health behaviours (Bainey et al., 2018; Zeng et al., 2023; L.Zhang et al., 2023).

Robust evidence has indicated that Chinese immigrants experience suboptimal CVD profiles. A large national cohort study found that increasing prevalence of CVD risk factors such as obesity and diabetes in Chinese immigrants was associated with longer residence in the host country (Jin et al., 2017a). According to a systematic review involving 258,474 participants, compared to their counterparts in China, Chinese immigrants had a higher prevalence and mortality from coronary heart disease (Gong & Zhao, 2016). Further, results from a meta-analysis with eight cohort studies showed higher short-term mortality after CVD diagnosis in Chinese immigrants than in the host population (Jin et al., 2015).

Self-care plays an important role in the prevention and management of CVD. Riegel et al. (2017) found that cardiac patients only spent about 10 hours per year with their healthcare providers, so most of the care cardiac patients experience for their CVD occurs outside of healthcare settings. Self-care comprises evidence-based practices for reducing cardiac mortality and hospital readmissions, and increasing quality of life (Riegel et al., 2017; Virani et al., 2023).

Multiple factors are known to influence patients' adherence to self-care behaviours, such as social determinants of health (such as education and income), health literacy, personal habits, culture and health beliefs, amongst others (Riegel et al., 2017; Virani et al., 2023). All these factors can complicate self-care and challenge patients with CVD in performing self-care practices. The complexities of self-care practice put extra strain on immigrant populations who work between their native and host cultures (Osokpo et al., 2021; Osokpo & Riegel, 2021). Chinese immigrants in Western countries have to adapt to new lifestyles, cope with the stresses of acculturation and negotiate the different health beliefs, treatment mechanisms and healthcare systems of their origin and host countries. All these considerations can differentiate Chinese immigrants' self-care behaviours from those of the host population.

A better understanding of self-care behaviours among first-generation Chinese immigrants living with CVD could facilitate the development of targeted interventions to improve their self-care behaviours and optimise their CVD health outcomes in Chinese immigrant populations. However, studies describing self-care behaviours in first-generation Chinese immigrants with CVD are scarce with only four quantitative and two qualitative studies identified. They can also be methodologically limited. For example, quantitative surveys, a popular approach, presuppose knowledge of the questions to ask (Zeng et al., 2023). Self-care behaviours in these studies were limited to lifestyle modification, medication adherence and seeking healthcare resources. Further, studies do not always distinguish first, second or mixed generations of migrants, whose self-care practices may vary significantly depending on their level of acculturation (Bainey et al., 2018).

4.4 Methods

Detailed information about the study methods was elaborated in Chapter 3.

4.4.1 Study aims

To address this gap, this study aimed to identify and describe self-care behaviours performed by first-generation Chinese immigrants living with cardiovascular disease in Australia, and factors perceived as barriers and facilitators to evidence-based self-care.

4.4.2 Design

Grounded in philosophical assumptions of naturalism/constructivism, a qualitative descriptive approach was employed in this study: an appropriate choice for early exploratory work in an understudied population, providing rich description despite limited time and resource availability (Bradshaw et al., 2017; Neergaard et al., 2009). The study was reported in line with the Consolidated Criteria for Reporting Qualitative Research (Tong et al., 2007).

4.4.3 Study setting and recruitment

Participants were included if they were: 1) adults who were first-generation Chinese immigrants to Australia, born in Mainland China, Hong Kong, Macao or Taiwan; 2) Australian permanent residents or citizens; 3) self-reported or medically diagnosed with CVD, including coronary heart disease, stroke or heart failure; 4) able to speak English or Mandarin; 5) able to provide informed consent, excluding those with history or evidence of impaired cognition such as dementia.

Purposive and snowball sampling were used in the study. Participants were recruited from three sources: social media, Chinese community associations and medical centres in Sydney, Australia. Electronic recruitment flyers were distributed via commonly used social media among Chinese immigrants in Australia, such as WeChat, the Sydney Today mobile app and 2ac Australian Chinese Radio. To be compliant with the public health orders in place to manage the COVID-19 pandemic at the time, the first author contacted gatekeepers of Chinese community associations to support recruitment by circulating electronic flyers in their community WeChat, Facebook and other online channels. After COVID restrictions were lifted, from May 2022 she attended Chinese community associations' social activities and circulated paper flyers in person and printed flyers were placed in reception areas at a medical centre. Potential participants were asked to circulate the information to any relevant family and friends who met the criteria. Participants who were interested in this research were invited to contact the first author via a phone number or email address. Recruitment continued until data saturation was reached, that is, until no new information emerged during interviews (Bradshaw et al., 2017). The recruitment period was from September 2021 to June 2022.

4.4.4 Data collection

The first author is a registered nurse and bilingual researcher with translation certification accredited by the National Translation Authority. Sharing the same cultural background with the potential participants, she understood some local dialects and cultural health beliefs and practices, which facilitated the conduct of the interviews. The author had no contact with any participants before the research project and maintained a neutral and non-judgemental attitude toward participants.

Table 4-1 Interview guide

Interview guide
What is your heart problem? Can you briefly tell me what happened?
Probes
<ul style="list-style-type: none">• Time, and place of the initial heart diagnosis• Risk factors for heart disease (listed individually)• Treatment plan (medications)• How did you feel about the initial heart diagnosis• Apart from medication, what advice have you received to manage your heart disease at home from health professionals?
Regarding any health advice you received, what did you do at home?
In the early days following the heart diagnosis, what did you do to take care of your heart health?
Probes
<ul style="list-style-type: none">• How do you take your medication?<ul style="list-style-type: none">▪ What medications do you take?▪ Do you take it regularly? Miss doses? Stop taking it?▪ Apart from Western medicine, take TCM? Traditional Chinese patent medicine? supplements?▪ Monitor effects/response to side effects?• Seeking healthcare services?<ul style="list-style-type: none">▪ Doctor (General practitioner, cardio specialist or allied health)▪ Reasons to access health services (follow-up, medication, symptoms, flu vaccination)▪ Communication issues? (barriers?)▪ How did you find and learn heart health materials?• Any changes in lifestyles?<ul style="list-style-type: none">▪ Diet (food choices, who cooks), social meals, smoking/alcohol▪ Exercise (type, frequency, with anyone? Noticed any symptoms)▪ Weight?▪ Coping with stress?▪ Sleep?• Symptom monitoring and response? (since the initial diagnosis, have you had any cardiac symptoms?)<ul style="list-style-type: none">▪ How did you monitor your condition? (blood pressure, blood sugar, cholesterol, international normalized ratio)▪ What symptoms do you relate to your heart problem?▪ What did you do about heart symptoms?▪ (optional) How did you prevent heart events? Triggers?
How did the diagnosis impact your family? What do they do about your heart health?
<ul style="list-style-type: none">• Supervision: Medication? Lifestyles? Seeking healthcare? Health information?• Monitor: symptoms• Assist: meals/ seek healthcare?
Nowadays, what do you do for your heart health? Can you tell me about any changes compared to your past experiences of taking care of your CVD? Why did you make these changes?

Having screened potential participants for eligibility, the first author explained the research verbally and supplied an information sheet and consent form to eligible participants. Simultaneously, participants' cognitive status was assessed through their understanding and appropriateness of responses during the conversation. The dates and times for the phone interviews were agreed upon with the participants. Participants were interviewed in Mandarin, their preferred language. Each interview was audio-recorded with consent, and the researcher took field notes.

A semi-structured interview was used, with an interview guide informed by the Middle-Range Theory of Self-care of Chronic Illness (Reigel et al., 2012, 2017). This was drafted, discussed and revised among the author group and piloted with volunteers whose data were not included in the study analysis. The interview started with structured questions about participants' demographic and clinical data related to their CVD diagnosis, followed by the open questions: "Regarding any health advice you received, what did you do at home? Or in the early days following the heart diagnosis, what did you do to take care of your heart health?" Probes were used to enable the participants to expand and articulate their CVD self-care behaviours in relation to self-care maintenance, self-care monitoring and self-care management, and to identify factors which they perceived as barriers and facilitators of this (Table 4-1).

4.4.5 Data analysis

The audio files were transcribed verbatim into Chinese by the first author (Clark et al., 2017). During the process, interview data were de-identified to ensure the participants' confidentiality. Twinn (1997) stated that the consistency and reliability of data translation in cross-language interview studies can be improved by using an independent translator to translate interview transcripts (Al-Amer et al., 2015). Accordingly, in this study, a professional translator independently translated transcripts into English. These translated transcripts were then independently validated by two bilingual researchers in the authorship team. The translated and validated transcripts were imported into NVivo 12 software for data analysis.

Deductive thematic analysis was employed (Clarke & Braun, 2017) with a predetermined list of codes informed by the Middle-Range Theory of Self-care of Chronic Illness and related self-care inventory (Riegel et al., 2019). In line with Clarke and Braun's (2017) guideline, the first author immersed herself in the data by repeatedly listening to the audio recordings for transcription, translation, validation and coding. At the same time, the author team inductively generated new

codes where data addressed the research aim, but the content was additional to that covered in the Theory of Self-care of Chronic Illness. The initial coding results were reviewed, and decisions on overarching themes were made by the three members of the author team. An example of the data coding process is presented in (Table 4-2).

Table 4-2 The coding process in data analysis

Data extraction	Codes	Sub-themes	Theme
<i>“Compared to the past, I cut down on the amount of vegetable oil and animal oil...I used to put some sesame oil, we called Xiangyou. Here, I use olive oil instead”</i>	Reduce cooking oil Change to healthy oil	Adaptation to heart-healthy diet	Dietary practice Self-care maintenance
<i>“No, I am not on any restricted diet... I do like to eat fatty meat. I still eat it. I eat that every day”</i>	No changes to a healthy diet Eat fatty meat daily	Maintenance of poor eating practices	

4.4.6 Ethical considerations

This study was approved by the Human Research Ethics Committee at the University of Technology Sydney, Australia (ETH21-6096).

4.4.7 Trustworthiness

In line with trustworthiness criteria developed by Lincoln & Guba (1985), all the authorship team engaged in peer debriefing and reflection during the data collection and analysis to ensure credibility. Prolonged engagement in data collection and data analysis was executed by the first author. Transferability was established by providing a rich description of the study participants, the location and the context of the research. To improve dependability, independent data translation and analysis of transcripts were conducted and then checked by the authorship team. Any discrepancies encountered during coding and analysis were discussed to achieve consensus. An audit trail was recorded for research-related decisions during the process. Moreover, potential personal bias during data collection was described and discussed amongst the authorship team to improve confirmability.

4.5 Findings

4.5.1 Characteristics of participants

Telephone interviews (mean duration: 63.6 minutes, ranging from 35.9 to 135.2 minutes) were conducted with 20 participants. There was no drop-out during the interviews. The mean age of participants was 69.9 years old; 12 were female. Most had migrated to Australia at relatively older ages, following their retirement in China. On average, they had lived in Australia for 14.4 years and all had limited English proficiency. Most were married and living with a partner or an extended family.

All participants were covered under Australia's universal health insurance, and half were privately medically insured. Most participants reported a diagnosis of coronary heart disease (CHD) while three had experienced a stroke. Many were diagnosed in Australia and had been living with CVD for more than three years. Most were prescribed conservative medications to manage their CVD initially (Table 4-3).

4.5.2 Self-care behaviours, barriers and facilitators

Self-care behaviours were organised into three themes: self-care maintenance, self-care monitoring, and self-care management. Within each theme, subthemes specified the domains of self-care behaviours (Table 4-4). Some themes were accompanied by the identification of factors perceived as influencing these self-care behaviours.

4.5.2.1 *Theme one: self-care maintenance*

Dietary practices

The dietary practices adopted by these Chinese Australian participants following their CVD diagnosis were diverse and fell into three categories: adaptation to heart-healthy diets, maintenance of poor eating practices, and continuance of previous healthy eating practices.

Table 4-3 Participants' socio-demographic and clinical profile (n=20)

Characteristics	Mean (SD), N	Range (%)
Age (years)	69.6 (4.7)	61.0-79.0 40.0-45.0 ^a
Duration of Australian residence (years)	14.4 (11.8)	2.0-42.0
Gender		
Male	8	40.0
Female	12	60.0
Self-reported English proficiency		
Poor	9	45.0
Basic	9	45.0
Good	2	10.0
Education level		
Middle school	2	10.0
High school	6	30.0
Junior college	5	25.0
Bachelor	7	35.0
Marital status		
Married	18	90.0
Divorced	1	5.0
Widowed	1	5.0
Living Status		
Alone	1	5.0
With partner	11	55.0
With a partner and children	4	20.0
With extended family	4	20.0
Employment status		
Part-time	1	5.0
Full-time	1	5.0
Unemployed	1	5.0
Retired	17	85.0
Private insurance	10	50.0
CVD Diagnosis		
Coronary heart disease	17	85.0
Stroke	3	15.0
Duration of CVD diagnosis (years)		
< 1	1	5.0
>1 and <3	7	35.0
>3 and < 10	10	50.0
> 10	2	10.0
Place of CVD diagnosis		
Mainland China	6	30.0

Characteristics	Mean (SD), N	Range (%)
Australia	14	70.0
CVD risk factors		
Hypertension	6	30.0
Hyperlipidaemia	14	70.0
Hyperglycaemia	1	5.0
Family history	6	30.0
Smoking	3	15.0
Depression	1	5.0
Other	3	15.0
Initial treatment		
Lifestyle intervention	1	5.0
Conservative medication therapy	16	80.0
Hospital admission treatment ^b	3	15.0
Number of chronic conditions		
None	3	15.0
1	11	55.0
2	4	20.0
3+	2	10.0

Abbreviation: CVD, cardiovascular disease.

^a Only one participant reported her age in this range.

^b Includes coronary artery bypass graft operation, stent operation and thrombolysis.

Table 4-4 Main themes and subthemes from the thematic analysis of qualitative interviews

Themes	Subthemes
Self-care maintenance	<p>Dietary practices</p> <ul style="list-style-type: none"> • Adaptation to heart-healthy diets^a • Maintenance of poor eating practices • Continuance of previous healthy eating practices <p>Physical activities</p> <ul style="list-style-type: none"> • Developing exercise routines • Limiting exercise or maintaining physical inactivity <p>Medication adherence</p> <ul style="list-style-type: none"> • Adherence to prescribed western medication • Use of Traditional Chinese medicine • Self-administration of health supplements <p>Stress management</p> <p>Medical follow-ups</p> <p>Seeking health information</p> <p>Other self-care maintenance behaviours</p> <ul style="list-style-type: none"> • Sleep and rest patterns • Drinking and smoking behaviours • Flu vaccination • Being vigilant to avoid triggers of angina
Self-care monitoring	<p>Interpreting bodily symptoms</p> <p>Checking bodily signs</p> <p>Medication monitoring</p>
Self-care management	<p>Angina management</p> <p>Bodily signs management</p> <p>Medication management</p>

^a Heart-healthy diet: diet pattern is rich in vegetables, fruit and wholegrains, reduced in unhealthy fats, salt and added sugar.

Adaptation to heart-healthy diets

Many participants attentively adapted to heart-healthy diets following their heart disease diagnosis. Those who made a conscious effort to incorporate heart-healthy dietary habits into their eating patterns changed their cooking styles and taste preferences by using less oil, salt and deep-frying. For example, they boiled food with water rather than braised with soy sauce. Changed choices of ingredients were also frequently mentioned. They restricted consumption of red or fatty meat which they replaced with fish and skinless chicken, and increased their intake of fruits, vegetables, wholegrain and beans. A few reduced their serving portion sizes or changed their main meal from dinner to lunch.

“Compared to the past, I cut down on the amount of vegetable oil and animal oil… I used to put some sesame oil, we called Xiangyou. Here, I use olive oil instead.” (P8, male, 71yrs, CHD 6 yrs)

For many participants, the motivation to change to a heart-healthy diet stemmed from their high health knowledge and how they regarded their diagnosis of heart disease. Having recognised that dietary habits are closely related to the development of heart disease and healthy diets to its management, participants changed their dietary practices. Participants also stressed that they shifted the focus of their lives to promote their general and heart health in their retirement, and thus they put effort into adopting healthy dietary practices.

“Although I knew it [high cholesterol] was bad, I did not know it would result in heart disease… Many years ago, I was too preoccupied with my work to be able to commit to my health.” (P4, female, 65yrs, CHD 4yrs)

Participants also reported that dietary acculturation to the food environment of Australia also served as a facilitator for them to adapt to a healthier diet. For example, most participants shifted to Western-style breakfasts (such as milk, cereals or bread), and some embraced local vegetables as they believed these foods were healthy.

“Here, I also try to eat more Australian local vegetables, because they are healthier… so I also cook them sometimes.” (P6, male, 68yrs, CHD 3 yrs)

Maintenance of poor eating practices

However, half the participants still maintained at least some of their previous unhealthy eating practices without restriction. They reported not paying attention to recommendations about heart-healthy diets following their CVD diagnosis, and instead continued consuming fatty meat, deep-fried food, high-salt items, sugary snacks and big portions of food.

“No, I am not on any restricted diet… I do like to eat fatty meat. I still eat it. I eat that every day.” (P1, male, 71yrs, CHD 6 yrs)

Multiple barriers to adaptation to heart-healthy diets were reported. Coming from a collectivistic culture, Chinese participants’ commitment to family could be a hurdle to adopting or maintaining heart-healthy diets. These participants prioritised their families’ needs over their own when conflicts emerged between family eating preferences and their heart-healthy dietary regime.

“…a big challenge for me since I came to Australia [laughing] I eat a lot for dinner because everyone is at home at dinner time… I eat many meat dishes which made me gain weight… As I prepare the family dinner, I have to taste the food. As a result, I end up eating more meat than I should without even realising it. So, that is the problem.” (P16, male, 76yrs, CHD 7yrs)

Lack of diet-related health education was a determining factor reported by some participants for not adapting their diet. Some participants said they had not received any or adequate health education on heart-healthy diets from doctors. Other participants pointed out that the diet-related health education they received from doctors was too general and broad. They also stressed that dietary behaviours are personal habits that doctors need to take into account when providing health education.

“There is no specific [health education] tailored to me as guidance, even though it has been more than 4 years since I got cardiovascular disease… Also, I do not receive individualised dietary advice from professionals like dietitians. [I expected to] hear from someone about this… I am very confused. I did not get any good advice in this regard.” (P2, male, 68yrs, CHD 4yrs)

Participants reported that dietary habits which had been ingrained for a lifetime were not easily shifted. Moreover, some also confessed that they wanted to preserve the joy in life that they

perceived to be conveyed by their customary diets for their quality of life. Hence, they did not, or not much restrict their dietary practices.

"I am not worried about it [eating fried food] ... I do not want my life quality to be decreased after I get cardiovascular disease. I still hope I can maintain the quality of my life, in order to eat what I like and to engage in the activities I enjoy." (P2, male, 68yrs, CHD 4 yrs)

Continuance of previous healthy eating practices

In some cases, (female) participants maintained dietary practices without making any deliberate changes where their dietary habits had previously been consistent with heart-healthy recommendations. Such diets were characterised by rarely eating meat, using little salt and oil, and meals being largely vegetable-based.

Physical activities

In relation to physical activities, participants' behaviours fell into two categories: those who developed exercise routines and those with limited exercise or who maintained physical inactivity.

Developing exercise routines

Most of these Chinese participants had incorporated some form of exercise routine into their lifestyles following their diagnosis. The most commonly mentioned exercise was walking more than one hour daily, followed by group activities including Tai Chi, square dancing and playing ball games in their neighbourhoods or at Chinese community centres. Having enough time following their retirement served as a facilitator for building up participants' exercise routines. Moreover, getting connected with the Chinese community and joining their activities helped participants improve their awareness, knowledge and practices on regular exercises. Alongside the adoption of exercise routines, several participants described how they considered the appropriate intensity for their physical activity, out of concern that it could have a negative impact on their cardiovascular condition, inducing angina. Not to over-exert themselves, they tailored their exercise, avoided strenuous exercise or changed previous running habits to gentle walking or Tai Chi.

"I also pay attention to the level of physical activities, neither too much nor too less. Because the beating heart pumps out the blood whenever you walk a step. So you can't walk too much or too less."(P8, male, 71yrs, CHD 6 yrs)

Limiting exercise or maintaining physical inactivity

However, some participants lacked motivation to exercise or did not prioritise exercise as an important element in self-care of heart disease, either limiting their exercise or deliberately maintaining a low level of physical inactivity. They gave various reasons for this. Four participants reported experiencing symptoms of arthritis and angina pain which dampened their motivation for regular exercise. Living at a distance from an exercise group activity was another impediment. One female participant who had lost her partner became physically inactive due to lack of motivation and related depression. Another female participant complained that between her caregiving role and her housework, she had no time to exercise.

"I used to go to the park in the morning. The two of us [with my husband] would walk together, do some exercise and have a chat. [after her husband had passed away] Now, I enjoy staying home, as it is nice and quiet." (P15, female, 69yrs, CHD 2yrs)

"In terms of exercise ... I rarely run nowadays, even though my doctor advised me...I told my doctor that I was afraid to run. Do you know why? I have, I had arthritis in both of my knees... So, I cannot run."(P16, male, 76yrs, CHD 7yrs).

Medication adherence

Participants' medication adherence behaviours fell into three categories: in relation to prescribed Western medicine, in relation to the use of Traditional Chinese Medicine (TCM) and to self-administration of health supplements.

Adherence to prescribed Western medication

Three-quarters (n= 15) of these Chinese participants reported being reasonably consistent in taking their prescribed Western medications most of the time. Many participants had well-established medication routines, with specific scheduling timetables for taking medication, assembling medication in advance and taking medications with them while travelling. The social status of health professionals in China was described as very high, so even where they harboured

doubts about the medication, participants still complied with physicians' prescriptions. This was partly out of respect for the prescriber's professional knowledge but also, given the social hierarchy distance between doctor and patient, they were afraid to displease their doctors. For some participants, the need they perceived to manage their disease and control symptoms motivated their medication adherence.

"I just thought, as a patient, all I could do is listen to my doctor and take my medications. That is it."(P19, female, 67yrs, CHD 1 yrs)

"I just take it more seriously than I used to. I did not have cardiovascular disease in the past, so I did not take it seriously. Now that I have it, I take my medications regularly." (P2, male, 68yrs, CHD 4yrs)

By comparison, four participants confessed to poor adherence to prescribed Western medications. Some considerations could dampen participants' motivation for medication adherence. These included where deliberate choices were made in respect of self-appraisal of symptoms or concerns about side effects; where there was genuine uncertainty about what they should be doing due to inconsistent opinions between physicians; and where they were affected by the psychological burden and overload of multiple medications to take in a day, leading to forgetfulness.

"Oh dear, I always forget [laughing]. I take my medications when I feel unwell. I stop when I am well again."(P7, female, 67yrs, CHD 33yrs)

Use of Traditional Chinese Medicine

Over one-third reported incorporating TCM to manage their heart disease, including traditional herbal medicine, Chinese patent medicine and food therapy. In particular, they identified the use of a fast-acting heart rescue pill (Suxiao jiuxin Pill), a Chinese patent medicine, as a first-line medication for relieving angina.

"Nitroglycerin does not work for me. I carry a different medication which I brought from China, called fast-acting heart rescue pills [Suxiao jiuxin Pill]. It is traditional Chinese medicine. But because it works so well, I really trust it."(P16, male, 76yrs, CHD 7yrs)

Influenced by the belief that, as TCM was natural it would therefore have fewer side-effects, some participants preferred TCM to treat their heart disease. Compared to Western prescribed

medication, the effectiveness of TCM for relieving angina as proven by their own experiences was another reason to take it. For other participants, as their heart disease was diagnosed in China before migrating to Australia, they had been taking the TCM prescribed by physicians in China for a long time, and continued even now they were in Australia.

“One was called [XXXX]. I am still on it, since it can keep [my heart rate] above 50. But it is traditional Chinese patent medicine, which is not available here. So [maintaining consistent supply]… is what I am most worried about [laughing].”(P3, female, 63yrs, CHD 14yrs)

Self-administration of dietary supplements

In addition to their prescribed Western medications and TCM, over half the participants reported taking dietary supplements. The most commonly used supplements for heart health were coenzyme Q10 and fish oil. Only one participant received a prescribed supplement: all other participants self-administered supplements recommended by their friends or family. Some believed these dietary supplements were especially beneficial for promoting their heart health and managing the heart symptoms.

“I have been taking it [Q10] for more than 10 years, without stopping it… No matter whether they are helpful, I think, at least they take a bit effect, rather than no effect at all… it protects the heart health. It helps in regard to the cardiac troponin.”(P8, male, 71 yrs, CHD 6yrs)

Stress management

Many of these participants stated they were more likely to manage their stress on their own, rather than seek professional support. Their well-developed personal values and cultural philosophies, such as living in the present, thinking positively and letting thoughts go, supported their capacity to cope with stressors. For some participants, practices, such as self-distraction or keeping busy with reading, travelling, gardening, watching TV or enjoying food, helped manage their stress levels. Other participants sought emotional support from family, Chinese community centres and psychological consultations. Some participants emphasised the importance of joining group activities held at Chinese community centres to alleviate their loneliness. However,

three participants claimed that they just endured stress as they did not know how to address their emotions appropriately.

"It feels lonely being here. We, old people, do not speak any English, and we know nothing here. So, I feel there is a need for me to adapt to the environment here [in Australia], if you live here. I have no choice. So, I only can go out every day and participate in all sorts of activities [at the community centre], even though I had never tried them before." (P3, female, 63yrs, CHD 14yrs)

Medical follow-ups

Most participants consistently visited their general practitioners or cardiologists for regular follow-up visits. However, participants reported factors which could potentially dampen their motivation for regular follow-up care. These included problems with previous care, such as where they had received differing opinions about their treatment from different providers; where their treatment was changed when they transferred from care under one system to another; and where they experienced poor therapeutic rapport with their physician. They could also defer follow-up when they self-appraised their symptoms did not require attention; for example, one female participant perceived no need to attend the cardiologist follow-up if she had no symptoms.

Seeking health information

Seeking CVD-related health information or resources is a common and essential behaviour in relation to self-care maintenance but was experienced variously among these Chinese Australians. Most participants sought CVD health information written in Chinese. They searched for health information on Chinese websites, news feeds and WeChat (popular social media in China), and by (less commonly) connecting to social networks both in Australia and China. Participants also read printed health information in Chinese versions, either sourced locally in Australia or brought from China. Attending health talks held at Chinese community centres was reported by one participant as a way to access CVD health information. However, a small number of participants demonstrated passivity by not reporting any effort to seek out CVD health information. Their only channel for health information was their general practitioners

who normally had little time to provide detailed health education, resulting in poor CVD health knowledge among these patients.

Participants frequently expressed a desire for more CVD health information to support their self-care decision-making and skills. Two main barriers were encountered by these Chinese Australian participants when seeking CVD health information. First and most commonly, over half the participants described a lack of access to culturally and linguistically appropriate CVD health information from mainstream health services, and they had not received targeted health education from either their general practitioner or cardiologist.

“First of all, I do not know what I should pay attention to in my daily life. For example, do I need to take care of my mental well-being, such as controlling my anger? Secondly, about my diet. I know I should avoid food high in cholesterol, but I do not know what particular food I am supposed eat in moderation, and what I should eat more. Then, there is exercise. So, at this stage, I need some very clear and specific recommendations on how I should look after myself as a cardiac patient, in terms of emotional wellbeing, diet, or lifestyle.”(P2, male, 68yrs, CHD 4 yrs)

Secondly, where these participants had received health education and guidance, what was provided by health practitioners was described as generic, too broad, not taking account of their individual circumstances. Accordingly, they wanted individualized CVD health information to assist them in maintaining their self-care practices.

“The doctor suggested I go for a brisk walk for 30 minutes every day. I was not able to follow that advice, because of my knee problems. They hurt when I walked for too long. And I also did not want any further damage done to my knees, so I avoided exercising too much.”(P17, female, 68yrs, CHD 6yrs)

Other self-care maintenance behaviours

A small number of participants also described other behaviours, with four emergent sub-categories of sleep and rest patterns, drinking and smoking behaviours, flu vaccination and avoiding triggers for disease symptoms.

Sleep and rest patterns

Some participants reported sleeping well at night, and half the participants had developed the habit of taking a nap after lunch. However, many found it a challenge to maintain good sleep quality as they complained of broken sleep, only sleeping lightly, and having disturbed sleep because of comorbidities such as joint pain and sleep apnoea. Two participants attributed their insomnia to addictively playing on their smartphones at night.

Drinking and smoking behaviours

Following their heart disease diagnosis, some participants who reported previous drinking habits had adjusted to drink only very occasionally, and in small or moderate amounts. One male participant who had smoked for 30 years complained that it was impossible to quit smoking overnight so he cut down to 6 or 7 cigarettes from one pack a day. Another female participant was affected by second-hand smoke from her husband, a heavy smoker who refused to follow her suggestion of smoking cessation.

Flu vaccination

More than three-quarters of participants complied with their general practitioners' recommendation of annual flu vaccination. A few were reluctant to be vaccinated on the basis of personal beliefs indicative of poor health knowledge on flu vaccination.

Being vigilant to avoid triggers of angina

Seven participants reported being vigilant to avoid triggers for angina or cardiac events, such as physical exertion, dehydration and heavy workload. Another participant emphasized the weather or temperature change, which he believed was related to blood circulation. The cold temperature could negatively impact the blood supply to his heart, so he put on more clothes in winter to keep warm to improve circulation to his heart.

4.5.2.2 Theme two: self-care monitoring

As recounted by these Chinese participants, four major monitoring activities were identified, encompassing interpreting bodily symptoms, monitoring signs, medications and weight.

Interpreting bodily symptoms

Chinese participants were vigilant to somatic changes, interpreted the symptoms and understood the seriousness with regard to episodes of angina or stroke. When asked what symptoms they believed may relate to their heart problem, many participants (80%) mentioned chest tightness, palpitations, shortness of breath, dizziness and fatigue in the context of physical exertion and negative emotions. Two participants with previous strokes voiced their anxiety that feelings of numbness indicated another episode of stroke.

“For example, numbness in my hands and feet, or my fingertips. That usually makes me worried if I had another stroke.”(P18, female, in the 40s, Stroke 1 yrs)

Atypical angina symptoms were also pinpointed by some participants, including tingling on the skin surface around the chest area, shoulder or armpit pain, feeling very hungry and generally feeling unwell.

“The feeling that I had to eat something immediately was quite urgent, as if I was starving. Then, I was sweating as well. I felt so tired that I had to sit down...I sometimes experienced dull pain in my arm at about 5 or 6 am...However, the pain spot varied each time.”(P19, female, 67yrs, CHD 1 yrs)

Checking bodily signs

Most participants reported being compliant to attend medical testing, predominantly blood tests and exercise stress tests. Many participants were vigilant in detecting their weight changes and tracked their weight fluctuation over time. Approximately half of these participants actively checked their own blood pressure, blood sugar and clotting results at home on a daily or weekly basis in addition to attending medical checkups. Four participants checked these body signs only when they felt unwell. Three participants did not monitor their body signs at all as they relied on medical examinations or perceived there was no need to check their “normal” body signs. Not having a blood pressure monitoring device available at home was reported by one participant as deterring her self-monitoring behaviour.

“...I do not monitor my blood sugar at home, because it has always been normal... But my GP did ask me to buy a blood pressure monitor...So, I have to wait for my daughter to buy one for me, as I cannot speak English.”(P17, female, 68yrs, CHD 6yrs)

Medication monitoring

Over half the participants reported being vigilant to monitor medication effectiveness and detect side effects using their somatic awareness, medication knowledge and personal experience. For example, when they took prescribed cardiac medications, they watched their bodies' reactions by self-measuring their heart rate and blood pressure. They used their knowledge of the common side effects of specific drugs; for example, muscle weakness or aches associated with statins. Participants on antiplatelet and anticoagulant medications closely checked for bruising and bleeding, and monitored their International Normalized Ratio (INR) blood test results, as instructed by their prescribers.

"I was on aspirin...I took one tablet every day and some bruises appeared in different areas... So, I was worried. I asked the doctor if I should stop taking it because some people told me about [the side effects]. And I showed him [the bruises]."(P3, female, 63yrs, CHD 14yrs)

4.5.2.3 Theme three: self-care management

Three self-care management behaviours were identified, involving angina, bodily signs and medication management.

Angina management

During an angina episode, the common management strategies reported by over half the participants included resting immediately and taking nitro-glycerine or quick-acting heart rescue pills (Suxiao jiuxin Pill) if the angina symptoms persisted. For some participants newly diagnosed with CVD or presenting with mild or atypical symptoms, their response was to tolerate and observe the symptoms, anticipating that the episode would resolve without intervention. Relaxing, talking with their family or eating something to relieve hunger symptoms were also performed to relieve the angina-related symptoms and stress. However, two participants with insight into the acuity of their heart condition called their families to send them to a hospital immediately.

"In the bedroom, I felt difficult to catch a breath... However, when I laid in the bed, it made me feel short of breath. I started feeling choked. Then I sat up right away and took one nitro-glycerine. I still felt bad after I took the nitro-glycerine. My son was at home

back then, I said to him: "let's go to the hospital as I am feeling unwell." So my son drove me to [hospital name]."(P8, male, 71 yrs, CHD 6yrs)

After an angina episode, some participants recognised the need for a review and made an appointment to consult their doctors. Others waited until the next follow-up. Notably, one participant sought reassurance from her family for her angina-related symptoms.

Bodily signs management

When changes were detected in bodily signs such as measurements of blood pressure, blood sugar or INR results, participants reported actively visiting their general practitioners for professional consultations. However, sometimes some participants adjusted their medications without consulting their doctors. Interestingly, one participant used his blood pressure records to indicate what he thought was the best time to take medication to achieve the best treatment outcomes.

"I find my blood pressure is highest at probably 5 am, with 80/140 mmHg sometimes. So I take the medication to control my blood pressure at that time... So my blood pressure is well controlled."(P9, male, 73yrs, CHD10 yrs)

Medication management

In response to concerns about medication effectiveness and side effects, some participants initiated consultations with their general practitioners. In contrast, over half the participants adjusted their medications themselves when suffering from medication side effects, rather than communicating with their physicians in the first instance. However, one participant self-adjusted warfarin with their physician's permission as she knew how to adjust the dose in line with her INR results. Other participants with high levels of health knowledge could rationalize medication side effects, interpret their seriousness and self-manage side effects under instruction.

"With dizziness, when I do some gardening in my backyard and suddenly stand up, for example, [I]may feel dizzy and need to find something to hold on to immediately. This may not be related to my heart, but blood pressure instead."(P1, male, 71yrs, CHD 6 yrs)

4.6 Discussion

The paper adds new knowledge by comprehensively describing self-care behaviours among first-generation Chinese immigrants with CVD in Australia, a group with a unique experience of two cultures, compared to other Chinese immigrant generations. Overall, many participants actively engaged in self-care for their CVD, particularly in self-care maintenance (e.g., adjusting to a heart-healthy diet, exercising regularly, and actively seeking out health services) and self-care monitoring. However, the ways in which participants engaged in these behaviours varied. Some practices did not align with conventional evidence-based guidelines released in Australia, but may reflect culturally grounded understandings of health, wellness, and self-care. Although most were broadly adherent to their prescribed medication regimens, self-adjustment of medications, use of TCM, and self-administration of health supplements were common practices among these populations. Of concern, how patients and families responded to acute cardiac events was suboptimal and delays could be compounded by using TCM. In addition to personal preference and disease-related health knowledge, language barriers and cultural adaptation were also important influences on self-care behaviours in these Chinese immigrants.

Participants described an accumulation of multiple sources of difficulty in adopting lifestyle changes within a context of widespread change due to migration. The challenges were acknowledged by changing lifestyle habits engrained over decades. Participants emphasized their lack of access to culturally and linguistically CVD-related health information, and predominantly blamed this for their limited abilities to perform evidence-based CVD self-care. This could, partially at least, explain their poor self-care management response to heart attacks, angina or stroke episodes. Where they recognised the seriousness of a diagnosis of CVD, this could motivate and facilitate the adoption of self-care behaviours but lack of culturally appropriate CVD health information posed a common and substantial barrier. Families could both help and hinder adherence to cardiac best practices but they suffered a similar lack of culturally and linguistically appropriate CVD health information. Further, participants wanted CVD health information that was not just culturally appropriate but tailored to take account of individual factors such as co-morbidities.

Our findings showed that many Chinese immigrants were willing to adopt a healthy diet following their CVD diagnosis. This was consistent with another study on Chinese immigrants with CVD (Jin et al., 2020). However, some participants still maintained previous poor dietary practices attributed to dietary habits, food acculturation and family obligations. Thus, it would be sensible for clinicians to assess Chinese immigrants' dietary habits and acculturation before

giving dietary guidance. To improve dietary adherence, clinicians could reinforce the heart-healthy components of cultural dietary practices and encourage them to integrate dietary recommendations within the local cuisine. Moreover, it is essential to get family members involved with dietary education.

Many Chinese immigrants in this study developed physical activity routines, similar to the findings of a review (Zeng et al., 2023), that this population commonly performed exercises such as walking, Tai Chi and swimming. Further, study findings showed Chinese community associations playing significant roles in promoting older Chinese immigrants with exercise routines such as Tai Chi, ball sports and dancing. Thus, community-based exercise interventions in collaboration with Chinese community managers could be developed to support Chinese immigrants with appropriate and sustained regular exercise intensity.

Whilst these immigrants reported broadly adhering to western-prescribed medications, they included TCM to manage their CVD and self-administration of heart health supplements was prevalent. Similar results were also reported in other studies from Australia and the US (Jin et al., 2020; King-Shier et al., 2017). This may in part be due to these participants' CVD having been diagnosed and initially treated in their country of origin, which was a new finding in our study. Further, these participants were prone to self-adjust their prescribed medications when side effects presented. Clinicians should bear these practices in mind when assessing Chinese immigrants' medication histories.

Participants stressed their lack of access to linguistically and culturally appropriate CVD health information from mainstream sources; also found in other studies exploring health information-seeking behaviours among Chinese immigrants in the US and Australia (Qian & Mao, 2021; L. Zhang et al., 2023). Many participants in this study had no admission history for an acute CVD event, and thus had not received heart health education from hospitals or cardiac rehabilitation. Therefore they sought online health information from Chinese websites which were not based on or verified in line with Australian treatment guidelines. This misalignment of information was a possible source of misunderstanding and mistrust between patients and doctors, further undermining Chinese immigrants' self-care behaviours. Interventions are required to improve access to CVD health education in outpatient and community settings. Consistent with a previous study (Xiao et al., 2023), Chinese immigrants heavily relied on Chinese social networks and Chinese community associations to access health information. It would be feasible to collaborate with Chinese community managers to develop and deliver CVD health education

programs to engage peer and community support to improve self-care literacy and skills in this population.

Another important finding of this study was the inadequate response to heart attack or angina management in this population. This was also confirmed in a previous study, where Chinese immigrants delayed seeking treatment for acute angina symptoms due to their poor health knowledge (Jin et al., 2020). Our study detailed the mechanism in response to an angina episode. They tended to use TCM (Suxiao jiuxin Pill, used for relieving angina, is a type of medicine made from traditional Chinese herbs and processed into pills, tablets, capsules or granules.) to relieve the symptoms and were reluctant to call an ambulance due to the language barrier and financial burden. Culturally and linguistically appropriate intervention is urgently needed to improve the first response to acute cardiac events by Chinese immigrants.

This study has some limitations. Firstly, participants were recruited solely from the Sydney area and whilst this location houses one of the biggest Chinese communities in Australia, study findings may not be transferrable beyond this. Another limitation is in regard to the inclusion criterion that required participants to speak English or Mandarin as this excluded immigrants who only spoke Cantonese. Moreover, during the interview, participants' sense of socially desirable responses may have generated data bias. The findings in this study need to be interpreted and transferred with caution considering the differences between the health systems in the various host countries; Australian Chinese immigrants' experiences with the Australian health system may not be reproducible for other Chinese immigrant populations. Finally, the transcripts were not provided to participants for feedback due to COVID-19 movement restrictions, which might have compromised study confirmability.

4.7 Conclusion

Most Chinese immigrants were motivated to engage in self-care behaviours for their cardiac disease, particularly in self-care maintenance and monitoring. However, their limited CVD health knowledge and skills in CVD self-care were not adequate to enable them to fully participate in evidence-based self-care behaviours and optimize their health outcomes. This was largely attributed to the lack of access to linguistically and culturally appropriate CVD health information involving not just the patients but also their families. This was echoed in their poor first response to acute cardiac events. Linguistically and culturally appropriate CVD health

education programs are urgently needed among this population in the community, targeting healthy lifestyle modification, medication literacy and cardiac symptom management. Partnering with Chinese community organizations offers an innovative route to co-design and deliver targeted CVD health education interventions and support for this population.

4.8 Chapter summary

This chapter addressed objectives 1 and 2 of this thesis by conducting a qualitative study using interviews, contributing new knowledge by demonstrating self-care behaviours among first-generation Chinese immigrants with CVD in Australia and identifying the barriers and enablers to their CVD self-care behaviours. The main findings are listed below:

- Overall, many Chinese participants actively engaged in their CVD self-care, particularly in self-care maintenance (e.g., adjusting to a heart-healthy diet, developing exercise routines, and utilising health services) and self-care monitoring (monitoring body symptoms).
- However, adherence to self-care behaviours was not universal in every aspect of self-care, and some practices described were not evidence-based. Particularly, self-adjustment of prescribed medications, use of TCM, and self-administration of health supplements were common practices among these populations. Their adherence to regular checks of body signs was inadequate.
- The self-care management in response to acute cardiac events was suboptimal among these participants, and delays in seeking medical services could be compounded by using TCM.
- In addition to factors such as illness perspectives, personal habits/experiences, place of diagnosis and health literacy, language barriers and cultural adaptation were important influences on self-care behaviours in these Chinese immigrants.

Chapter 5 Phase Two Quantitative Results: Self-care Behaviours and Related Factors

5.1 Chapter introduction

This chapter reports the findings from the phase two quantitative survey study, which assessed the self-care behaviours performed by first-generation Chinese immigrants living with CVD in Australia and identified factors associated with their CVD self-care behaviours. These findings address the following objectives of this thesis:

1. To survey participants to demonstrate the self-care behaviours among Chinese Australians living with CVD.
2. To survey participants to identify factors impacting their CVD self-care behaviours.

5.2 Results

5.2.1 Participants' demographic and clinical characteristics

In total, 315 participants were invited to take part in this survey; four refused, which provided a response rate of 98.7%. After removing empty and ineligible survey responses, 260 records were retained for data analysis (i.e., a useable response rate of 82%). Of these, participants' ages ranged from 54 to 95 years, with a mean (SD) age of 71.8 (7.8) years. More than half (52.3%) were male, and for two-thirds of participants (66.5%), their highest educational attainment was a Bachelor's or diploma degree or above. Almost all (91.4%) lived with either their nuclear or extended family. The mean (SD) duration of residence in Australia was 16.7 (11.4) years, and almost half (41.8%) reported that they did not speak English. Most (92.2%) were unemployed or retired, most (96.5%) held an Australian Medicare card (conferring access to publicly funded healthcare), and 51.8% were covered by private insurance (Table 5-1).

Most participants (83.5%) reported a diagnosis of coronary heart disease, and almost one-third had been diagnosed in Mainland China, Hong Kong or Taiwan. One-quarter of the participants had been admitted to hospital for CVD treatments: stent insertion, bypass surgery or thrombolysis. Their mean (SD) disease duration was 7 (7.3) years. Just over one-quarter (28.5%) reported being confident in their CVD-related health knowledge (Table 5-1).

Table 5-1 Demographic and clinical characteristics of participants (n = 260)

	Overall (n = 260) ¹		Female (n = 123, 47.7%)		Male (n = 135, 52.3%)		gender-difference <i>p</i>
	N	%	N	%	N	%	
Age (years, SD)	71.8	7.8	71.7	7.8	71.8	7.8	0.856
Residence duration (years, SD)	16.7	11.4	16.1	11.1	17.2	11.7	0.416
Self-reported English proficiency							0.119
Not at all	107.0	41.8	51.0	41.8	56.0	41.8	
A little	101.0	39.5	54.0	44.3	47.0	35.1	
Good	48.0	18.8	17.0	13.9	31.0	23.1	
Education level							0.038
≤ High school	86.0	33.5	48.0	39.3	38.0	28.1	
Bachelor's or diploma	157.0	61.1	71.0	58.2	86.0	63.7	
≥ Master's	14.0	5.4	3.0	2.5	11.0	8.1	
Living status							<0.001
Living with extended family ²	109.0	42.6	52.0	43.0	56.0	41.8	
Living with core family ³	125.0	48.8	49.0	40.5	76.0	56.7	
Living alone	22.0	8.6	20.0	16.5	2.0	1.5	
Employment status							0.111
Yes	20.0	7.8	6.0	5.0	14.0	10.4	
No	236.0	92.2	114.0	95.0	121.0	89.6	
Medicare card							Not applicable ⁶
Yes	249.0	96.5	117.0	95.9	131.0	97.0	
No	9.0	3.5	5.0	4.1	4.0	3.0	
Private insurance							0.398
Yes	132.0	51.8	59.0	49.2	73.0	54.5	
No	123.0	48.2	61.0	50.8	61.0	45.5	
Disease diagnosis							Not applicable
Coronary heart disease (CHD)	217.0	83.5	99.0	80.5	117.0	86.7	
Stroke	22.0	8.5	14.0	11.4	7.0	5.2	
Both CHD and stroke	20.0	7.7	10.0	8.1	10.0	7.4	
Heart failure	3.0	1.2	2.0	1.6	1.0	0.7	
Place of diagnosis							0.706
Mainland China, Hong Kong, Taiwan	81.0	32.0	39.0	33.3	42.0	31.1	
Australia	172.0	68.0	78.0	66.7	93.0	68.9	
Received hospital							<0.001
Yes	65.0	25	17.0	13.8	48.0	35.6	
No	195.0	75	106.0	86.2	87.0	64.4	

	Overall (n = 260) ¹		Female (n = 123, 47.7%)		Male (n = 135, 52.3%)		gender-difference <i>p</i>
	N	%	N	%	N	%	
Disease duration (years, SD)	6.9	7.3	7.2	7.8	6.9	6.9	0.743
Data recruitment setting							
Community site ⁴	93.0	35.8	63.0	51.2	28.0	20.7	
Cardiac clinic	167.0	64.2	60.0	48.8	107.0	79.3	
Confidence in CVD-related health knowledge							
No confidence	57.0	23.6	29.0	26.1	28.0	21.5	
Neutral	116.0	47.9	57.0	51.4	58.0	44.6	
Confidence	69.0	28.5	25.0	22.5	44.0	33.8	
Use cardiac TCM ⁵							
Yes	88.0	35.1	38.0	31.9	50.0	38.2	
No	163.0	64.9	81.0	68.1	81.0	61.8	
Search CVD-related health information							
Only Chinese resources	125.0	51.4	57.0	50.4	67.0	51.9	
Western resources	63.0	25.9	35.0	31.0	28.0	21.7	
Never search	55.0	22.6	21.0	18.6	34.0	26.4	

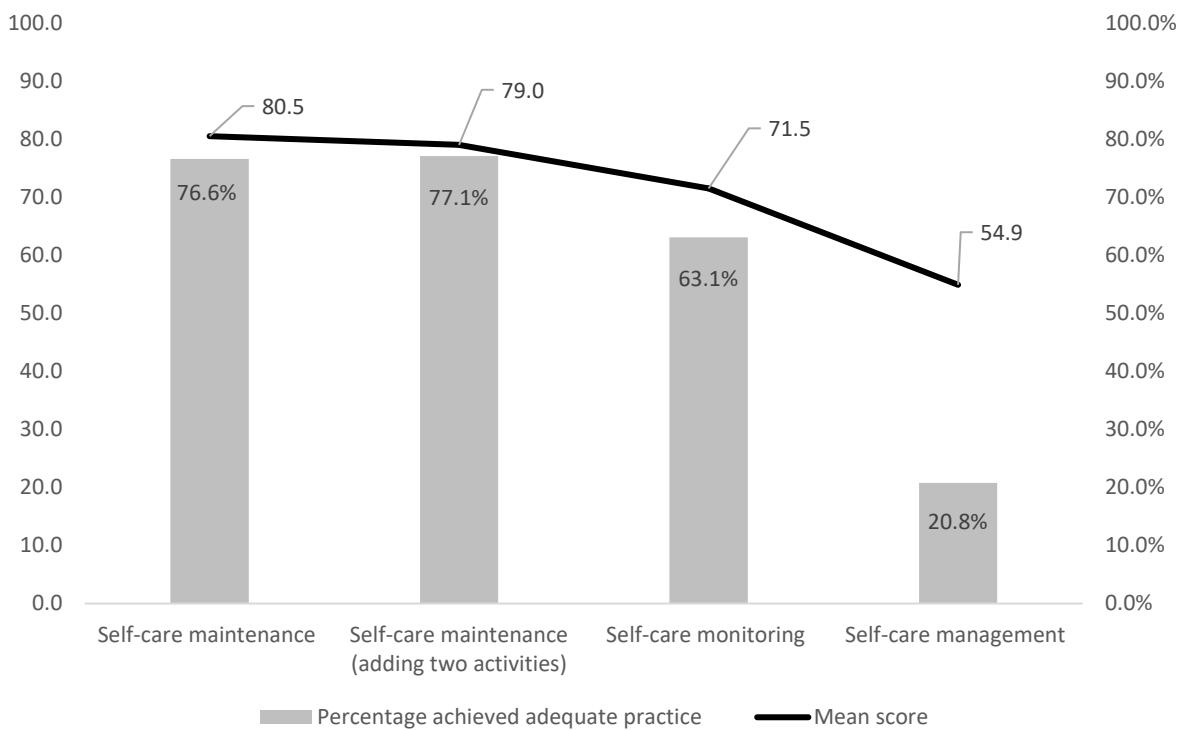
Note: ¹ Two missing data points on a question about gender. ² Living with grandchild/grandchildren. ³ Living with a partner, child/children or parents. ⁴ Community site refers to the data collected from Chinese community centres and social media. ⁵ Traditional Chinese Medicine. ⁶ Group size too small to test differences.

5.2.2 Participants' CVD self-care behaviours

5.2.2.1 Self-care maintenance

For the entire sample, the mean (SD) self-care maintenance score was 80.5 (15.8), and 76.6% achieved the threshold value for adequate self-care maintenance (Figure 5-1). With scores for the two additional activities (sleep and avoiding triggers), the mean (SD) self-care maintenance score, 79.0 (15.1), remained similar to the original self-care maintenance score, and 77.1% achieved threshold values for adequate self-care maintenance.

Figure 5-1 Self-care subscale scores for the total sample (n = 260)



The most frequently practised individual-item activities of the self-care maintenance subscale (Figure 5-2-a) were eating fruits and vegetables, attending medical appointments and avoiding getting sick. These remained the most frequent when the scores of the two additional activities were compared to the original self-care maintenance subscale items. By contrast, the least frequently performed activities were taking aspirin, asking for low fat food when eating out and relieving stress. After adding the two extra activities to the original self-care maintenance subscale, getting good sleep was one of the least frequently performed activities.

5.2.2.2 Self-care monitoring

For the entire sample, the mean (SD) self-care monitoring score was 71.5 (20.1), and 63.1 achieved the threshold value for adequate self-care monitoring (Figure 5-1). The most frequently practised individual-item activities of the self-care monitoring subscale (Figure 5-2-b) were monitoring or checking body condition, paying attention to changes in feelings and monitoring for symptoms. In contrast, the least frequently performed activities were monitoring body weight and checking blood pressure.

Figure 5-2 Item-level responses for the self-care subscales (n = 260 participants)

Figure 5-2-a Self-care maintenance

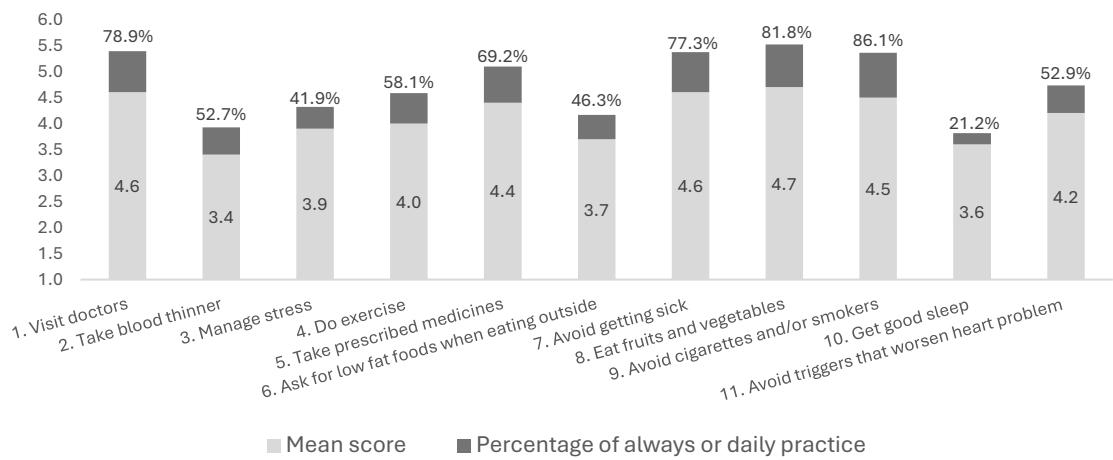


Figure 5-2-b Self-care monitoring

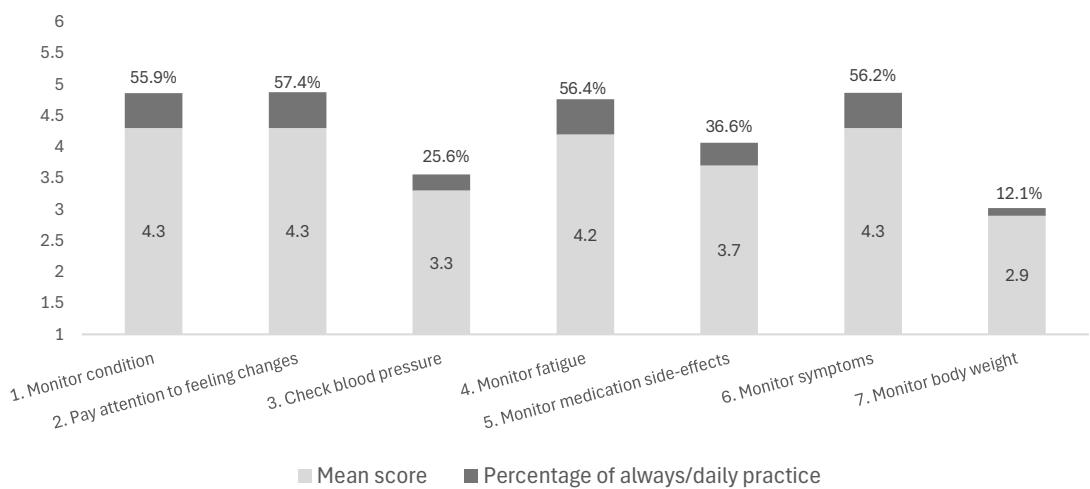
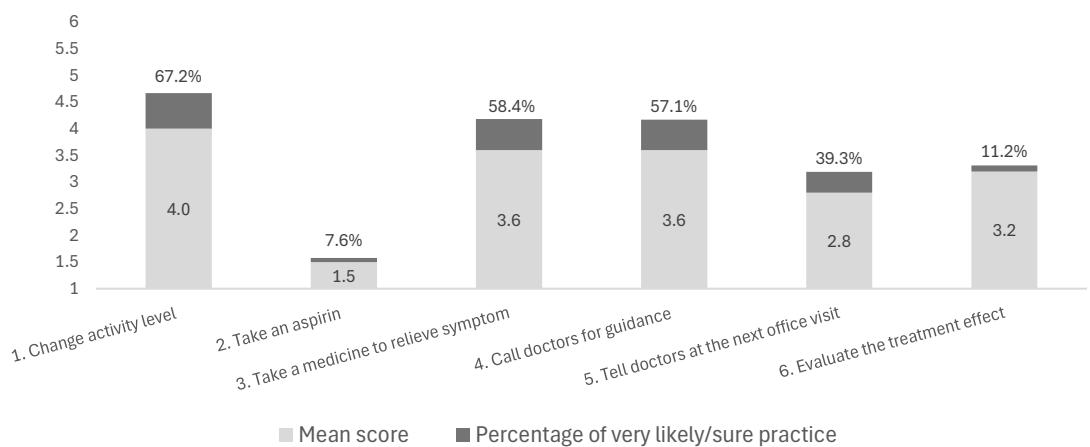


Figure 5-2-c Self-care management



5.2.2.3 Self-care management

For the entire sample, the mean (SD) self-care management score was 54.9 (20.8), and 20.8% achieved adequate self-care management (Figure 5-1). The item-level activities of the self-care management subscale that were the most likely to be undertaken were changing activity level, followed by being somewhat likely to take medication or call a doctor for advice (Figure 5-2-c). In contrast, taking aspirin and telling doctors about the cardiac or stroke symptoms at the next office visit were the least likely behaviours.

5.2.2.4 Other self-care behaviours

Over half the participants only searched for CVD-related health information from Chinese resources, such as Chinese websites, Chinese social networks and physical books brought from China. One-quarter searched for CVD-related health resources from Western websites, hospital health booklets or heart health talks in Chinese community centres.

In the open response text, nearly half of the participants reported lacking CVD health education and expressed similar attitudes about receiving CVD-related health information in Australia:

“I don't know how to take care of my heart condition.”(P 45)

“Please educate us on first aid knowledge for a heart attack.”(P 257)

Only 11.6% of the whole group reported being able to very quickly recognise heart or stroke-related symptoms such as chest pain, shortness of breath and chest pressure. Around one-third of participants (31.5%) used TCM to manage their CVD condition. The most common form of TCM taken to manage angina or heart-related symptoms was ‘Quick-acting heart reliever (Suxiao jiuxin Pill)’, which 19.2% of participants reported using:

“Apart from adopting a healthy lifestyle, the effect of taking Traditional Chinese Medicine or Chinese patent medicine on chronic heart disease is pretty good, such as Huangqi, danshen, sanqi, renshen et al.”(P20)

5.2.3 Factors associated with CVD self-care behaviours

5.2.3.1 *Factors associated with self-care maintenance*

In univariate regression analysis, gender, living status, recruitment setting, receipt of hospital treatment and confidence in CVD-related health knowledge were significantly associated with self-care maintenance scores ($p < 0.05$) (Table 5-2). After adding the two extra activities to the original self-care maintenance subscale, another two variables, age and employment status, were also significantly associated with self-care maintenance scores.

In multiple regression analysis, older people ($\beta = 0.44$, 95% CI: 0.22, 0.66), participants recruited from cardiac clinics rather than community sites ($\beta = 21.14$, 95% CI: 16.93, 25.36), those who felt confident in their CVD-related health knowledge ($\beta = 6.02$, 95% CI: 1.24, 10.80) and those who searched for Western CVD health information ($\beta = 6.23$, 95% CI: 1.64, 10.82) rather than those who only searched for Chinese health information all had significantly higher self-care maintenance scores than their counterparts ($p < 0.05$) (Table 5-2). This remained unchanged after adding the two extra activities to the original self-care maintenance scale.

5.2.3.2 *Factors associated with self-care monitoring*

In univariate regression models, living status, recruitment setting, confidence in CVD-related health knowledge and searching for CVD health information were significantly associated with self-care monitoring scores ($p < 0.05$) (Table 5-2).

In multiple regression modelling, participants recruited from cardiac clinics had a significantly 21.86 points higher self-care monitoring score than those recruited from community sites (95% CI: 16.14, 27.58). Those that felt confident in their CVD health knowledge had a significantly 9.59 points higher self-care monitoring score than those who lacked confidence (95% CI: 2.96, 16.23), and searching for Western CVD health resources was linked to an 8.04 points higher self-care monitoring score compared to those who only searched for Chinese health resources (95% CI: 1.19, 14.89). Never having searched for CVD health information was related to significantly 10.29 points lower self-care monitoring scores compared to those who only searched for Chinese health resources (95% CI: -16.15, -4.44). Surprisingly, self-reported good English proficiency was significantly linked to lower self-care monitoring scores compared to those who did not speak English at all ($\beta = -9.72$, 95% CI: -16.16, -3.27) (Table 5-2).

Table 5-2 Factors associated with CVD self-care behaviours in participant groups (*n* = 260)

Self-care maintenance		Self-care maintenance (Two activities added) ⁶		Self-care monitoring		Self-care management		
Model:	Univariate	Multivariable ⁵	Univariate	Multivariable	Univariate	Multivariable	Univariate	Multivariable
Variable	β	β	β	β	β	β	β	β
	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI
Age	0.22 (-0.05, 0.48)	0.44*** (0.22, 0.66)	0.28* (0.03, 0.52)	0.46*** (0.26, 0.67)	-0.185 (-0.52, 0.15)		0.13 (-0.22, 0.47)	
Gender								
Female (ref) ¹								
Male	5.87** (1.90, 9.83)		5.56** (1.79, 9.33)		4.40 (-0.69, 9.49)		3.86 (-1.46, 9.18)	
Residence duration	-0.04 (-0.22, 0.14)		-0.07 (-0.24, 0.09)		-0.09 (-0.32, 0.13)		-0.14 (-0.37, 0.10)	
Self-reported English language proficiency								
Not at all (ref)								
A little	0.82 (-3.67, 5.30)		0.49 (-3.79, 4.77)		-0.32 (-5.98, 5.35)		0.51 (-5.39, 6.42)	
Good	1.88 (-3.84, 7.59)		0.48 (-4.92, 5.89)		-2.09 (-9.31, 5.12)	-9.72** (-16.16, -3.27)	-0.48 (-7.97, 7.02)	
Education level								
≤ High school (ref)								
Bachelor's or diploma	0.36 (-3.97, 4.68)		0.85 (-3.27, 4.96)		0.71 (-4.76, 6.19)		5.08 (-0.56, 10.73)	

Self-care maintenance		Self-care maintenance (Two activities added) ⁶		Self-care monitoring		Self-care management		
Model:	Univariate	Multivariable ⁵	Univariate	Multivariable	Univariate	Multivariable	Univariate	Multivariable
Variable	β	β	β	β	β	β	β	β
	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI
\geq Master's	-3.08 (-12.16, 6.00)		-1.94 (-10.59, 6.70)		-1.76 (-13.25, 9.73)		10.15 (-1.65, 21.95)	
Living status								
With extended family (ref)								
With core family	-0.37 (-4.53, 3.78)		-0.83 (-4.79, 3.13)		-5.35* (-10.62, -0.08)		3.80 (-1.69, 9.29)	
Alone	-10.01* (-17.92, -2.10)		-9.09* (-16.64, -1.54)		-2.08 (-12.12, 7.97)		-1.77 (-12.47, 8.93)	
Employment status								
Unemployed (ref)								
Employed	-6.12 (-13.69, 1.45)		-7.56* (-14.58, -0.55)		1.08 (-8.66, 10.81)		-4.33 (-14.40, 5.75)	
Private insurance								
Yes (ref)								
No	-3.00 (-7.03, 1.04)		-1.68 (-5.53, 2.17)		-4.85 (-9.92, 0.21)		1.96 (-3.35, 7.27)	
Recruitment setting								
Community site ² (ref)								
Cardiac Clinic	16.63*** (12.87, 20.39)	21.14*** (16.93, 25.36)	15.15*** (11.54, 18.76)	19.74*** (15.78, 23.69)	16.50*** (11.44, 21.56)	21.86*** (16.14, 27.58)	-6.13* (-11.79, -0.46)	

Self-care maintenance		Self-care maintenance (Two activities added) ⁶		Self-care monitoring		Self-care management		
Model:	Univariate	Multivariable ⁵	Univariate	Multivariable	Univariate	Multivariable	Univariate	Multivariable
Variable	β	β	β	β	β	β	β	β
	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI
Hospital treatment								
Yes (ref)								
No	-6.41** (-10.89, -1.93)		-5.36* (-9.64, -1.08)		-2.75 (-8.55, 3.05)		-8.85** (-14.77, -2.93)	-9.08** (-14.79, -3.37)
Disease duration	-0.20 (-0.50, 0.11)		-0.20 (-0.49, 0.09)		-0.34 (-0.72, 0.03)		0.32 (-0.08, 0.73)	
Location of diagnosis								
China ³ (ref)								
Australia	2.30 (-2.04, 6.64)		2.05 (-2.04, 6.14)		-0.19 (-5.70, 5.32)		-2.44 (-8.16, 3.29)	
Confident in cardiovascular disease knowledge								
Not confident (ref)								
Neutral	6.69** (1.71, 11.67)	6.08** (1.86, 10.29)	6.52** (1.85, 11.19)	5.97** (2.02, 9.93)	11.11*** (4.86, 17.37)	7.76* (1.87, 13.65)	7.62* (1.04, 14.20)	
Confident	6.19* (0.67, 11.72)	6.02* (1.24, 10.80)	7.08** (1.90, 12.26)	6.70** (2.22, 11.18)	12.69*** (5.76, 19.63)	9.59** (2.96, 16.23)	13.64*** (6.37, 20.91)	5.87* (0.18, 11.56)
Use of cardiac TCM ⁴								
Yes (ref)								
No	-0.35		-0.10		-4.18		-10.29***	-12.35***

Self-care maintenance		Self-care maintenance (Two activities added) ⁶		Self-care monitoring		Self-care management		
Model:	Univariate	Multivariable ⁵	Univariate	Multivariable	Univariate	Multivariable	Univariate	Multivariable
Variable	β	β	β	β	β	β	β	β
	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI
	(-4.60, 3.90)		(-4.11, 3.91)		(-9.53, 1.16)		(-15.70, -4.88)	(-17.59, -7.11)
Search for cardiovascular disease-related health information								
Only Chinese resources (ref)								
Western resources	-5.16 *	6.23**	-3.63	6.81**	-5.49	8.04*	7.98*	10.24***
	(-10.04, -0.29)	(1.64, 10.82)	(-8.25, 0.98)	(2.50, 11.11)	(-11.52, 0.53)	(1.19, 14.89)	(1.68, 14.27)	(4.24, 16.24)
Never search	-4.22		-3.93		-13.75***	-10.29***	-6.74*	
	(-9.28, 0.83)		(-8.71, 0.85)		(-19.96, -7.55)	(-16.15, -4.44)	(-13.23, -0.24)	

Note: ¹ref: reference. ²community site: refers to the data collected from Chinese community centres and social media. ³China: mainland China, Hong Kong, Taiwan, Macao.

⁴TCM: Traditional Chinese Medicine. ⁵Adjusting for age, gender, residence duration, English proficiency, education level, living status, employment status, private insurance, recruitment setting, hospital treatment, disease duration, diagnosis place, knowledge confidence, Use of cardiac TCM, search heart health information. ⁶Adding sleep and trigger avoidance. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.2.3.3 Factors associated with self-care management

In univariate linear analysis, recruitment setting, receipt of hospital treatment, confidence in heart health knowledge, use of cardiac TCM and having searched for heart health information were significantly associated with self-care management ($p < 0.05$) (Table 5-2).

In multiple regression analysis, participants who felt confident in their CVD-related health knowledge ($\beta = 5.87$, 95% CI: 0.18, 11.56) and searched for Western CVD health resources ($\beta = 10.24$, 95% CI: 4.24, 16.24) had higher self-care management scores than those who lacked confidence in their CVD health knowledge and only searched for Chinese health resources. Not having been admitted for hospital treatment ($\beta = -9.08$, 95% CI: -14.79, -3.37) and not using cardiac TCM ($\beta = -12.35$, 95% CI: -17.59, -7.11) were significantly associated with lower self-care management scores (Table 5-2).

5.3 Chapter summary

This chapter addressed objectives 1 and 2 of this thesis by contributing new knowledge through demonstrating self-care behaviours among first-generation Chinese immigrants with CVD in Australia and identifying factors impacting their CVD self-care behaviours. The main findings were as follows:

- Overall, the study sample demonstrated an adequate level of self-care maintenance and monitoring for CVD, but the level of self-care management was found to be inadequate.
- At the item level of each self-care subscale, the least frequently performed activities by these participants were:
 - for self-care maintenance, taking aspirin, asking for low fat food when eating out and getting good sleep
 - for self-care monitoring, monitoring body weight and checking blood pressure
 - for self-care management, taking aspirin and telling doctors about their cardiac symptoms at the next office visit.
- Confidence in cardiovascular-related health knowledge and searching for Western-sourced health information was significantly associated with better adherence to CVD self-care behaviours across all the subscales.
- Being older was positively related to self-care maintenance, and participants receiving hospital treatment and taking TCM performed better in self-care management.

- Participants recruited from cardiac clinics performed better in CVD self-care maintenance and monitoring than those recruited from community sites.

Chapter 6 Phase One Qualitative Results: Acculturation Experiences and Impact on Self-care

6.1 Chapter introduction

This chapter reported findings from the phase one qualitative data which aimed to identify the acculturation experiences of Chinese immigrants with cardiovascular disease (CVD) in Australia and describe how these acculturation experiences influenced their CVD self-care behaviours. These findings addressed the following objectives of this thesis:

3. To conduct preliminary individual interviews to identify the acculturation experiences of Chinese Australians living with CVD.
4. To conduct preliminary individual interviews to investigate the impact of acculturation on self-care behaviours reported among Chinese Australians living with CVD.

These findings were published in *Health & Social Care in the Community* in 2024. The manuscript has been reproduced in this chapter with permission under the Creative Commons Attribution license (CC BY 4.0). The published paper is available in Appendix 18. The paper can be referenced as:

Zeng, L., Xu, X. & Perry, L. (2024). The role of acculturation in self-care behaviours among Chinese immigrants living with cardiovascular disease: A qualitative study. *Health & Social Care in the Community*, 2024(1). <https://doi.org/10.1155/2024/2120099>

6.2 Abstract

Aims: To understand what domains of acculturation are experienced by Chinese immigrants with cardiovascular disease (CVD) in Australia, and how these domains of acculturation influence their CVD self-care behaviours.

Design: A qualitative descriptive design.

Methods: Individual phone interviews were conducted among Chinese immigrants with CVD in Sydney, recruited from Chinese Community associations and social media. Inductive and

deductive thematic analysis was employed, guided by the Middle-Range Theory of Self-Care of Chronic Illness and the conceptual model of acculturation.

Results: Twenty participants, mean age of 69.9 years, were interviewed. The domains of acculturation in relation to CVD self-care behaviours encompassed cultural practices, cultural values, healthcare system navigation and new living environment. Retaining their Chinese culture and integrating into Australian culture regarding dietary practices, social networks, traditional values and family relationships served as both enablers and barriers of self-care maintenance through factors such as heart-healthy diets, physical activity, stress management and medication adherence. Many participants denied encountering difficulties to utilise primary care services, but language barriers deterred them from accessing acute services and heart-health information from mainstream sources. Some preserved beliefs and practices in Traditional Chinese Medicine may have complicated their self-care maintenance (medication adherence) and self-care management (responding to acute angina episodes).

Conclusion: The influence of acculturation on CVD self-care behaviours among Chinese immigrants is multifaceted and individualized. Clinicians and community health workers should assess patients' acculturation experiences to enable culturally sensitive practices. The lack of culturally and linguistically appropriate heart health information in the community should be addressed urgently to mitigate the cardiac health disparity. Collaboration with Chinese community associations offers an opportunity for co-design and dissemination of information about Australian healthcare systems and heart health education to upskill CVD self-care practices and mitigate the health inequities experienced by Chinese immigrants.

6.3 Introduction

Cardiovascular disease (CVD) has been the leading cause of death globally for many years, and approximately 19.8 million deaths globally were attributed to CVD in 2022 alone (Mensah et al., 2023; World Health Organization, 2021). It creates enormous and growing burdens which disproportionately affect immigrant groups compared to host populations (Agyemang & van den Born, 2022).

People from China comprise one of the largest and fastest-growing immigrant populations globally, and the most popular countries where Western cultures are dominant to which they have migrated are the United States of America, Canada, Australia, New Zealand, and the United

Kingdom (Li et al., 2018). In recent years, many Chinese have relocated to these countries at relatively older ages through sponsorship of their adult children who migrated first. It has been widely reported that Chinese immigrants experience disadvantageous CVD profiles, with the risks of obesity and diabetes increasing in parallel with increasing residence duration (Jin et al., 2017a). A systematic review involving 258,474 participants found greater prevalence and mortality from coronary heart disease in Chinese immigrants compared to their counterparts in China (Gong & Zhao, 2016). At the same time, another review and meta-analysis of data from eight cohort studies found greater short-term cardiac mortality in Chinese immigrants than in the host populations (Jin et al., 2015).

Self-care is an evidence-based practice for reducing cardiac mortality and hospital readmission, and increasing quality of life (Riegel et al., 2017; Virani et al., 2023). Based on the middle-range Theory of Self-Care of Chronic Illness (Riegel et al., 2012), the concept of self-care compromises three key processes. Self-care maintenance refers to behaviours performed to stabilize an illness process or preserve health status, such as healthy lifestyle adaptation and medication adherence. Self-care monitoring is defined as activities taken in order to be vigilant, observing body changes such as measuring blood pressure. Self-care management entails patients' evaluation of their treatment or their response to changed body signs and symptoms. Multiple factors are known to influence self-care, including characteristics recognised as social and cultural determinants of health (for example education level, economic status and ethnicity), challenging patients' ability to practice CVD self-care (Riegel et al., 2017; Virani et al., 2023). Further, the complexities of self-care practice are compounded for immigrant populations who work between two cultures, negotiating across the health beliefs and healthcare systems of both their country and culture of origin and that of their host countries.

Acculturation, a complex and multidimensional change process, occurs when two different cultures interact, resulting in various adaption forms in tandem with cultural and psychological changes (Berry, 2019). To conceptualize acculturation Schwartz and colleagues (2010) proposed an expanded model that could generate a comprehensive understanding of the journey of the acculturation experience. The resultant changes are explored in three domains: cultural practices (language use, media preferences, social interaction and cultural foods), cultural values (cultural beliefs) and cultural identification (attachment to cultural group) in relation to the original culture and the host culture, respectively. Acculturation plays a significant role in immigrants' health, including the progress of CVD (Dafoe & Wong, 2018). Robust evidence has

indicated that levels of acculturation are closely related to CVD profile and disease management among immigrants (Eh et al., 2016; Modesti et al., 2021).

A clear understanding of the influence of acculturation is required to accurately describe self-care behaviours among first-generation Chinese immigrants living with CVD and to develop targeted interventions to minimize the CVD health inequities experienced by Chinese immigrants. However, a recent systematic review has shown that studies of acculturation experiences in relation to CVD self-care behaviours in Chinese immigrants are scarce (Zeng et al., 2023). Few studies distinguish Chinese first-generation immigrants from second or mixed generations, whose self-care practices may vary significantly depending on the level of acculturation (Bainey et al., 2018). Moreover, in many papers, acculturation was examined using proxy acculturation measures such as length of residence or age at migration. This has restricted understanding of the comprehensive mechanisms of the cultural adaptation process and its influence on Chinese immigrants' CVD self-care behaviours. To address this gap, this study aimed to address two questions: 1) What domains of acculturation are experienced by first-generation Chinese immigrants with CVD in Australia? 2) How do these domains of acculturation influence their CVD self-care behaviours?

6.4 Method

Detailed methods have been described in Chapter 3.

6.4.1 Design

Underpinned by philosophical assumptions of naturalism/constructivism, which generates an understanding of a phenomenon by analysing the meanings that participants ascribe to it and describe to investigators (Bradshaw et al., 2017), a qualitative descriptive approach was an appropriate choice for this early exploratory work, capable of generating a rich description of an understudied phenomenon (Bradshaw et al., 2017; Neergaard et al., 2009). The study was reported in line with the Consolidated Criteria for Reporting Qualitative Research (Tong et al., 2007).

6.4.2 Study setting and recruitment

Participants were recruited if they met all the following inclusion criteria:

- First-generation adult Chinese immigrants to Australia, born in Mainland China, Hong Kong, Macao or Taiwan;
- Australian permanent residents or citizens;
- Self-reported or medically-diagnosed with CVD, including coronary heart disease, stroke or heart failure;
- Speaking English or Mandarin;
- Providing informed consent, excluding those with a history or evidence of impaired cognition.

A combination of purposive and snowball sampling was employed to recruit participants via three primary sources: social media, Chinese Community associations and medical centres in Sydney, Australia between September 2021 to June 2022. Electronic recruitment flyers were distributed through social media platforms such as WeChat, the Sydney Today mobile app and 2ac Australian Chinese Radio. The first author initially approached gatekeepers of Chinese community associations for support in disseminating electronic flyers via their social media. After COVID restrictions were lifted in May 2022, this author circulated paper flyers in person while attending Chinese community associations' outdoor activities. Paper-based flyers were made available in reception areas at a medical centre. Initial participants were asked to pass on details of the research and recommend participation to their family or friends living with CVD.

Potential participants who expressed interest in this research were invited to contact the first author via the phone number or email address provided. She screened potential participants, provided a verbal explanation of the research and sent electronic participant information sheets to eligible potential participants. The dates and times for the phone interviews were agreed upon with the participants.

6.4.3 Data collection

The first author interviewed participants in their preferred language (Mandarin) and aimed to create a warm and non-judgmental environment for the interview. Participants consented to audio-recording of the interviews and the author took field notes during the process.

A semi-structured interview guide was drafted, informed by the Middle-Range Theory of Self-care of Chronic Illness (Riegel et al., 2012, 2017) and the conceptual model of acculturation (Schwartz et al., 2010). This was discussed and revised among the author group and piloted with volunteers whose data were not included in the study analysis. The interview started with collecting participants' demographic and clinical data, followed by open-ended questions with probes concerning their CVD self-care behaviours, acculturation experiences and how these unique experiences influenced their self-care behaviours (Table 6-1). Recruitment and interviews continued until data saturation was achieved; that is, until no new information emerged during interviews (Bradshaw et al., 2017). No repeat interviews were carried out.

6.4.4 Data analysis

The audio files were transcribed verbatim in Mandarin by the first author (Clark et al., 2017). Following Twinn's (1997) method to improve the consistency and reliability of data translation in cross-language interview studies (Al-Amer et al., 2015), transcripts were independently translated into English by professional translators, and then validated by bilingual researchers of this author group. English-translated transcripts were imported into NVivo 12 software for data analysis.

The first author immersed herself in the data set by repeatedly listening to the audio recordings for transcription, translation, validation and coding analysis. Deductive and inductive thematic analysis was employed (Clarke & Braun, 2017), with a predetermined list of codes developed based on the Middle-Range Theory of Self-care of Chronic Illness with the related self-care inventory proposed by Riegel et al.(2019), and Schwartz et al.'s (2010) conceptual model of acculturation. Additional codes were generated by reading the transcript line-by-line and coding for topic content. Coding and findings were progressively checked and discussed within the author team.

6.4.5 Ethical considerations

This study was approved by the Human Research Ethics Committee at the University of Technology Sydney with registration number ETH21-6096. Informed consent was obtained from all individual participants included in the study.

Table 6-1 Interview guide

Interview guide
1.What is your heart problem? Can you briefly tell me what happened?
<u>Probes</u>
<ul style="list-style-type: none">• Time and place of the initial heart diagnosis• Risk factors for heart disease (listed individually)• Treatment plan (medications)• How did you feel about the initial heart diagnosis• Apart from medication, what advice have you received to manage your heart disease at home from health professionals?
2. Regarding any health advice you received, what did you do at home? In the early days following the heart diagnosis, what did you do to take care of your heart health?
<u>Probes</u>
<ul style="list-style-type: none">• How do you take your medication?<ul style="list-style-type: none">▪ What medications do you take?▪ Do you take it regularly? Miss doses? Stop taking it?▪ Apart from Western medicine, take TCM? Traditional Chinese patent medicine? supplements?▪ Monitor effects/response to side effects?• Seeking healthcare services?<ul style="list-style-type: none">▪ Doctor (General practitioner, cardio specialist or allied health)▪ Reasons to access health services (follow-up, medication, symptoms, flu vaccination)▪ Communication issues? (barriers?)▪ How did you find and learn heart health materials?• Any changes in lifestyles?<ul style="list-style-type: none">▪ Diet (food choices, who cooks), social meals, smoking/alcohol▪ Exercise (type, frequency, with anyone? Noticed any symptoms)▪ Weight?▪ Coping with stress?▪ Sleep?• Symptom monitoring and response? (since the initial diagnosis, have you had any cardiac symptoms?)<ul style="list-style-type: none">▪ How did you monitor your condition? (Blood pressure, blood sugar, cholesterol, INR)▪ What symptoms do you relate to your heart problem?▪ What did you do about heart symptoms?▪ (optional) How did you prevent heart events? Triggers?
3. How did the diagnosis impact your family? What do they do about your heart health?
<ul style="list-style-type: none">• Supervision: Medication? Lifestyles? Seeking healthcare? Health information?• Monitor: symptoms• Assist: meals/ seek healthcare?
4. Nowadays, what do you do for your heart health? Can you tell me about any changes compared to your past experiences of taking care of your CVD? Why did you make these changes?

Interview guide

5. After moving to Australia, have you noticed any cultural differences?
Have you made any changes in your daily life? Can you tell me about these?
Thinking about a typical day when living in China, can you compare this to a typical day in Australia?
Are there any differences? Have you made any changes?

Probes

- Daily life such as language and media use, social network, food preference etc.
- Cultural values such as family relationships, life values
- Cultural identification
- Experience of seeking medical care

7. How do these changes affect your way of managing your heart health?
Do they make any difference to your ways of managing your heart health?
If so how, can you tell me about this?

6.4.6 Rigor and flexibility

Grounded in the trustworthiness criteria proposed by Lincoln and Guba (1985), credibility was ensured by the author team's ongoing engagement in data collection and analysis. Peer debriefing meetings were held regularly to check on the research process. A thick description of the study participants and the context of the research were provided to establish transferability. In terms of dependability and confirmability, data transcription, translation, and analysis were conducted independently and checked by team members. Any discrepancies during these processes were addressed among the research team. An audit trail was recorded during the whole process. The researchers explored their attitudes toward the topic and findings to avoid personal bias and further create confirmability. The first author, who collected and coded the data, is a registered nurse and a bilingual researcher certified by the National Translation Accreditation Authority. She identified from the same cultural background as these participants. She understood some local dialects and cultural health beliefs and practices, which facilitated the conduct of the interviews. The author had no contact with any participants before the research project and held non-judgemental attitudes toward the interview and data analysis process.

6.5 Results

6.5.1 Participant characteristics

Telephone interviews (mean duration 63.6 minutes, ranging from 35.9 to 135.2 minutes) were conducted with 20 Chinese Australian participants. There was no drop-out from recruitment. The mean age of 19 participants was 69.9 years. The majority of participants were female (60%); most had migrated to Australia at a relatively older age (mean 55 years), following their retirement in China, and had lived in Australia for mean 14.4 years. All had limited English proficiency; half were privately medically insured. The majority (90%) were married and lived with a partner or extended family (Table 6-2). Most participants reported a diagnosis of coronary heart disease while three had experienced stroke. Some (30%) were diagnosed in China before moving to Australia. Many (60%) had been living with CVD for more than three years and for most (80%) their CVD was predominantly managed conservatively with prescribed medical treatments (Table 6-3).

6.5.2 Acculturation experiences in relation to self-care behaviours

Acculturation experiences influencing CVD self-care behaviours were organised into four major themes: cultural practices and self-care, cultural values and self-care, healthcare system utilisation and self-care, and new living environment and self-care. Within each theme, subthemes specified each domain of acculturation (Table 6-4). Theme four was a relatively small domain of acculturation experiences in relation to CVD self-care. Due to limited related interview data, this theme was not expanded with subthemes.

6.5.2.1 *Theme one: cultural practices and self-care*

Participants' self-care behaviours, especially self-care maintenance, were intertwined with cultural practices, predominantly dietary practices, social networks, language and media preferences.

Table 6-2 Participants' demographic characteristics (n=20)

Characteristics	Mean (SD) (N)	Range (%)
Age (years)	69.6 (4.7)	61.0-79.0 40.0-45.0 [^]
Age at migration (years)	55.0(12.4)	32.0-73.0 30.0-35.0 [^]
Length of residence in Australia (years)	14.4(11.8)	2.0-42.0
Gender		
Male	8	40.0
Female	12	60.0
Language spoken at home		
Mandarin	17	85.0
Cantonese or dialect	2	10.0
English	1	5.0
Self-reported English proficiency		
Poor	9	45.0
Basic	9	45.0
Good	2	10.0
Education level		
< High school	2	10.0
High school	6	30.0
Some college/technical school	5	25.0
Bachelor	7	35.0
Marital status		
Married	18	90.0
Divorced	1	5.0
Widowed	1	5.0
Living Status		
Alone	1	5.0
With partner	11	55.0
With partner and young children	4	20.0
With extended family	4	20.0
Employment status		
Part-time	1	5.0
Full-time	1	5.0
Unemployed	1	5.0
Retired	17	85.0
Private insurance cover	10	50.0

[^] One participant only reported their age in this range.

Table 6-3 Participants' CVD related clinical characteristics (n=20)

Characteristic	N	%
CVD Diagnosis		
Coronary heart disease	17	85.0
Stroke	3	15.0
Diagnosed following:		
Health check	9	45.0
Presenting symptoms	11	55.0
Duration of CVD diagnosis (years)		
≤ 1	1	5.0
>1 and ≤3	7	35.0
>3 and ≤ 10	10	50.0
> 10	2	10.0
Place of CVD diagnosis		
Mainland China	6	30.0
Australia	14	70.0
CVD risk factors		
Hypertension	6	30.0
Hyperlipidaemia	14	70.0
Hyperglycaemia	1	5.0
Family history	6	30.0
Smoking	3	15.0
Depression	1	5.0
Other	3	15.0
Initial treatment		
Lifestyle intervention	1	5.0
Conservative medication therapy	16	80.0
Thrombolysis	2	10.0
Coronary artery bypass graft operation	1	5.0
Recurrent hospital admission		
No	16	80.0
Yes	4	20.0
Number of chronic conditions		
None	3	15.0
1	11	55.0
2	4	20.0
3+	2	10.0

CVD: cardiovascular disease

Table 6-4 Participants' acculturation experiences in relation to CVD self-care behaviours

Themes	Subthemes	Acculturation experiences	Self-care influenced
Cultural practice and self-care	Dietary practice	<ul style="list-style-type: none"> ▪ Retaining cultural dietary habits ▪ Integrating into Australian dietary culture 	Self-care maintenance enablers and barriers Self-care maintenance enablers and barriers
	Social networks	<ul style="list-style-type: none"> ▪ Coping with the separation from overseas social networks ▪ Establishing new community ties 	Self-care maintenance enablers and barriers Self-care maintenance enablers
	Language use and media preference	<ul style="list-style-type: none"> ▪ Accessing healthcare systems ▪ Seeking heart health information 	Overall self-care barriers Overall self-care barriers
Cultural values and self-care	Traditional values	<ul style="list-style-type: none"> ▪ Retaining traditional values ▪ Adjusting to Australian values 	Self-care maintenance and management enablers and barriers Self-care maintenance enablers
	Family relationships	<ul style="list-style-type: none"> ▪ Retaining traditional family ties ▪ Adjusting individualism 	Self-care maintenance, monitoring and management enablers and barriers Overall self-care enablers
Healthcare systems utilisation and self-care	Medical service navigation		Overall self-care enablers and barriers
	Patient and doctor interactions		Overall self-care enablers
	Traditional Chinese medicine		Self-care maintenance and management barriers
	Financial issues including health insurance		Overall self-care enablers and self-care management barriers
New living environment and self-care			
		Good air quality, weather temperature, food safety	Overall self-care enablers

Dietary practices

Dietary patterns comprised a significant component of the acculturation experience. How these immigrants adapted to a new culture was influential in their dietary behaviours. Participants' dietary acculturation experiences were categorized as retaining cultural dietary habits and/or integrating into Australian dietary culture. Both dietary acculturation experiences served to facilitate or deter adherence to a heart-healthy diet: an essential component of CVD self-care maintenance.

Retaining cultural dietary habits

There was consensus that participants preferred Chinese cuisine, irrespective of their duration of residency. They reported that they were accustomed to Chinese foods and that it was hard to change their taste preferences and cooking style. For example, heavily salted and spiced dishes were prominent in some parts of China and participants from these locations found difficulty adapting to low-salt dietary recommendations. Cantonese participants held cultural dietary beliefs about the nutritious value of meat stew and its benefits for health and disease recovery, despite that one participant reported that it increased her cholesterol level. In Chinese culture, food functions not only to preserve life and health but also for the joy of living, perceived as conveyed by their customary diets. Consequently, some participants were unconcerned about heart-healthy diets, which deterred adherence to dietary recommendations.

“But sometimes I can't change my dietary habit. First, people who come from Wuhan prefer salty and spicy food. I lose my appetite if the food is not salty and spicy.” (P9, male, 73yrs, residence 10yrs, CHD10 yrs)

Nevertheless, cultural dietary habits did not always deter adherence to recommended diets. Participants from some parts of China preserved culturally determined light eating patterns, such as using less salt and oil for cooking, simplifying adherence to heart-healthy diets.

Integrating into Australian dietary culture

Despite maintaining Chinese cuisine, most participants had, to some extent at least, integrated into Australian food culture. Breakfast was the first meal to change post-migration, with most partially or entirely adopting a Western-style breakfast (such as milk, cereals and bread). Collectively, participants increased their consumption of vegetables, fruits, seafood, dairy products, eggs and wholegrains following migration, attributing this to their local availability,

affordable prices and food safety in Australia. Some reported being accustomed to eating salads and tasting local vegetables as they believed these foods were healthy. This dietary acculturation facilitated their adaptation to heart-healthy dietary recommendations.

“There must be some changes [in my diet]. For example, I did not eat carrots that much when I was in China. After coming here, I started to eat more carrots. Broccoli is another example… Avocado is available here, not in China.” (P3, female, 63yrs, residence 8yrs, CHD 14yrs)

Conversely, a few participants adopted some local dietary behaviours that did not align with recommendations, such as ‘fast food’ (e.g. pizza and burgers), bakery goods (cakes and pastries) and lollies (sweets). One participant who previously loved eating fish changed to eating more red meat as it was much cheaper in Australia.

Social networks

Social networks, a second domain of acculturation experience, can reflect the extent to which immigrant participants have adapted to a new cultural community, including coping with the separation from overseas social networks and establishing new community ties. Networks mainly influenced participants’ self-care maintenance of their CVD in relation to dietary practices, physical activity, stress management and medication adherence.

Coping with separation from overseas social networks

Separation from previous social networks in China was both a driver and constraint to engaging in self-care. Some participants talked of how, in China, complicated social relationships and collectivist social norms could put a lot of strain on people to prioritise others over their own needs. Some felt greater peace of mind after moving to Australia and living a simpler social life, which was seen as beneficial for stress management. Engaging with fewer social activities and meal gatherings in Australia made it easier to take medication on time and follow a heart-healthy diet.

“Whether it is my [heart] condition or any other disease, patients need good rest to help with their recovery or disease management… I had many friends and relatives there [in China]. They needed my help with all sorts of things, which kept me busy…So, I had more

stress. Too much stress and socialising are not good for my health." (P17, female, 68yrs, residence 5yrs, CHD 6yrs)

Following their migration, some participants still actively maintained overseas social networks which they used to seek heart health information and emotional support. However, such recommendations could include encouragement to take TCM or health supplements to manage their heart condition, which could negatively affect their prescribed medication regimes.

Establishing new community ties

Many participants moved to neighbourhoods that were ethnic enclaves, actively sought Chinese community centres and joined Chinese group activities. These new social networks provided a means to share their experiences of acculturative stress and mitigated their feelings of social isolation, which assisted them in better managing their stress. Membership of Chinese community centres supported participants in CVD self-care, for example, by taking part in regular group exercises such as dancing, Tai Chi and table tennis, and peer support for adherence to exercise recommendations. Some reported that attending health talks in the community centre and exchanging health information with friends there motivated them to adopt a healthy diet and improved their self-efficacy to manage their heart disease.

"I have found a … art group…They are all Chinese so that we can have a chat and do activities together, such as singing, dancing and playing instruments. I am happy with that." (P16, male, 76yrs, residence 3yrs, CHD 7yrs)

Language and media preferences

The first settlement challenge reported by almost all participants was a language barrier. It shaped their ways of accessing healthcare and seeking heart health information in Australia, which are essential aspects of CVD self-care maintenance.

Accessing healthcare systems

Almost all participants denied that language was a barrier in seeking primary and cardiologist services because they proactively sought Chinese-speaking physicians. When they encountered an English-speaking physician, their adult children interpreted for them, or they used a health service interpreter. By contrast, the inability to converse in English was a significant deterrent

to accessing ambulance and hospital services, which reduced participants' self-efficacy for managing acute cardiac events.

"We do not speak English... What if I need an ambulance due to my heart condition or when something else goes wrong? That kind of situation worry me. If I were in China, because I speak the language, I could call an ambulance right away, or go to the hospital."

(P3, female, 63yrs, residence 8yrs, CHD 14yrs)

Seeking CVD health information

Language barriers also blocked participants' access to CVD health resources and information from mainstream healthcare services and media. Many participants lacked CVD health knowledge to support their self-care decision-making and skills. They searched for health information in Chinese via Chinese media (websites, social media, apps and books) and ethnic social networks. However, the health information they accessed was not necessarily scientifically verified and could be 'folk medicine'; some advice clashed with Western treatment recommendations and could be detrimental to their treatment adherence and overall self-care behaviour.

6.5.2.2 Theme two: cultural values and self-care

Traditional values and family relationships were strong influences on participants' CVD self-care behaviours in self-care maintenance, self-care monitoring and self-care management.

Traditional values

Retaining traditional values

Most participants had retained traditional values post-migration and many referred to or indicated that these were based on religious or philosophical principles, such as Buddhist, Taoist or Confucian thought, which they had grown up with. Half the participants endorsed Buddhist values that encourage people to let go of worry and live in the present; these values enabled participants to manage their daily stress and shaped their illness perspectives. For example, after being diagnosed with heart disease, these participants quickly accepted this and actively engaged in treatment and CVD self-care rather than worrying about the disease. High

importance was placed on keeping a peaceful mind in Taoist philosophy, which was embraced by some participants to achieve emotional stability for promoting their heart health.

“Anyway when the disease comes...I just accept it and adapt to it...I just followed the doctors and did whatever they suggested. If I had spare time, I sometimes sought heart-related health information...I didn’t feel stressed when I knew I had a stroke.”(P10, female, 64yrs, residence 32yrs, stroke 8yrs)

Confucianism beliefs see the experience of pain as a part of life that a person should endure unless it becomes unbearable. However, this value could conflict with self-care management recommendations for heart symptoms. One participant reported enduring palpitations at work without taking any action to manage the symptoms. Also, the characteristics of reserved emotion in Chinese culture prevented participants from accessing psychological support services to manage their stress.

“Actually, I wanted to see a psychologist very early on. However, you know, Chinese people are reserved by nature. That is our tradition. We do not like to talk about our feelings with others.” (P3, female, 63yrs, residence 8yrs, CHD 14yrs)

Adjusting to Australian values

Although many participants initially denied any changes regarding cultural values, further exploration revealed that some participants had incorporated some Australian individualistic perspectives into their post-migration lives. Participants reported being able to prioritise their individual health needs by restricting and simplifying their social responsibilities and slowing the pace of their lives in Australia. They praised Australia’s relaxed lifestyle, which contributed to their emotional well-being and enabled better self-care for their CVD condition.

“It is not like China where I had to be concerned about everything that I needed to deal with. I was exhausted but had no choice, because it was my responsibility to handle it. Here is much simpler…not stressed out. I should take care of myself and try to relax.” (P4, female, 65yrs, residence 6yrs, CHD 4yrs)

Family relationships

Retaining traditional family ties

Collectivism lies at the centre of family relationships in Chinese culture. Traditional family values, retained by most participants, were a powerful influence on their heart disease self-care behaviours. In keeping with the collectivistic culture they had grown up in, participants prioritized family over individual needs, which could make self-care of their heart disease difficult. For example, one female participant was dedicated to caring for her husband who lived with chronic disease, and explained that this meant she had no time for regular exercise. For many participants, their ability to follow dietary recommendations depended on the dietary habits of their family members. Where participants were responsible for preparing the family food, some had to prioritize their family taste preferences.

“It is challenging for you to ask all of them to follow a low-fat, low-salt diet to meet your nutritional needs. It is just not realistic. All of them love meat, including my grandchildren. I actually have to consider their preferences when I cook.” (P16, male, 76yrs, residence 3yrs, CHD 7yrs)

Filial piety is a value deeply rooted in Chinese collectivistic culture. Receiving filial piety from adult children was a protective factor for participants’ emotional well-being. Some adult children with solid values of filial piety were actively involved in their parents’ heart disease management, including supervising their recommended diet and exercise, obtaining medications, making disease-related decisions in response to symptoms, and providing language interpretation to access health services. However, some adult children were only weakly adherent to filial piety. Family conflict could arise from intergenerational discrepancies in filial piety-centred family values, resulting in emotional distress and social isolation in some participants, further undermining their emotional well-being.

“We would like to live together, and I can ask him if I need help. I do not speak English and know nothing about this country…So, it makes sense that I hope to live with my son. Right? … [But they live separately] Of course, I was really not happy [sobbing].” (P3, female, 63yrs, residence 8yrs, CHD 14yrs)

Most participants stressed that individuals assumed responsibility for managing their heart disease, which echoed the collectivist value of not burdening the family. This encouraged participants to take an active role in their self-care behaviours. Nonetheless, although

participants internalised responsibility for managing their heart disease, many family members were also actively involved in this, predominantly in supporting heart-healthy diets, adhering to medications, avoiding strenuous activities and making decisions on symptom management.

“She [wife] may ask me: ‘Have you taken your medications today? Have you had it or not?’ Or she may say: ‘No, it has too much cholesterol. Don’t eat that.’ Things like this.”
(P2, male, 68yrs, residence 33yrs, CHD 4yrs)

Adjusting to Australian individualism

Following migration, some participants reported that their high expectations of filial piety in their children were in transition. To reconcile or avoid family conflicts, these participants slowly adjusted to the individualistic cultural values espoused by their adult children and learned to live independently. Achieving this change mitigated their emotional distress and motivated them to engage in heart disease self-care.

“If I had lived with him and his family all the time, I do not think my health could have handled it. It is just too much. I actually enjoy living on my own. Nobody tells me what I should do... Now, I do not always put their interests first. My generation makes sacrifices all the time.” (P15, female, 69yrs, residence 13yrs, CHD 2yrs)

6.5.2.3 Theme three: healthcare systems utilisation and self-care

Being able to access and make use of healthcare services in their adopted country was an integral aspect of these Chinese immigrants' acculturation experience and shaped their overall self-care practices for heart disease. Participants' recollections of adapting to the new healthcare system in Australia were categorised as: navigating medical services, patient and provider interactions, traditional Chinese Medicine (TCM), and financial issues including health insurance.

Navigating medical services

Many participants felt they had adapted to their new healthcare system. They actively sought access to primary care medical services to manage their cardiac medications and symptoms, and attended cardiologist clinics. However, some participants experienced difficulties using medical

services due to unfamiliarity with the healthcare system. They largely relied on general practitioners to access allied health services.

Several participants compared their experience of the Chinese healthcare system, where they could book to see a cardiac specialist directly, to the referral system and long waiting times in Australia, which were significant barriers to accessing specialist and hospital services that could result in unmet health needs. For example, one participant self-adjusted his cardiac medication as he was told he was not eligible for a specialist referral for medication consultation. In another example, the need to take up a general practitioner's time just to obtain a referral deterred one participant from seeking a specialist consultation for her worsening heart condition.

"I felt awful, especially after midnight...I need to see my GP and get a referral before making my appointment with a cardiologist. However, I personally felt that I did not want to bother my GP, so I decided to skip my appointment. I did not see my GP for my heart condition." (P17, female, 68yrs, residence 5yrs, CHD 6yrs)

Consequently, some participants turned to TCM practitioners in Australia or returned to China for cardiac medical services, which could discourage adherence to Australian prescribed treatments and limit self-care engagement.

By contrast, other participants had high praise for Australian health services, referring to the high quality of patient-centred care culture, triage system in the emergency department (ED) and culturally appropriate care, to which they attributed their overall self-care engagement. For example, heart disease was prioritised in ED in Australia, which cleared barriers to participants seeking medical services in response to their acute heart condition. One participant attributed his well-controlled blood sugar to his dietitian's culturally customised dietary recommendations.

"What he said was: Stay away from rice, flour and sugar... Take staple food as an example. We used to have white rice every day. Now, we eat whole grains. We mix rice with coarse grains." (P13, male, 75yrs, residence 16yrs, CHD 2yrs)

Patient and provider interactions

Interactions with healthcare providers (HCPs) were critical to Chinese immigrants' healthcare experience and exerted an important influence on their cardiac self-care maintenance and monitoring. Many participants reported positive experiences interacting with HCPs. This was

linked to the authority and prestige of HCPs in Chinese culture. The professional ethics of HCPs were highly valued by many participants, and this valuing facilitated the development and continuance of therapeutic relationships and treatment adherence, including for medications and follow-up appointments.

“My rule of thumb is, listen to doctors. Don’t you think so? Try your best and then follow medical advice. And that is it [laughing].” (P13, male, 75yrs, residence 16yrs, CHD 2yrs)

Some participants reported higher satisfaction with interactions with HCPS in Australia than in China, which they linked to the focus on patient empowerment and shared decision-making. This enabled them to take the initiative in monitoring their heart disease and managing its symptoms, prioritising adherence to prescribed medication regimes and attendance at regular follow-up appointments. For example, some participants closely monitored their blood pressure and consulted their HCPs for medication adjustment.

“My blood pressure is not well controlled with this medication. I talked to my doctor … [they] changed my hypertensive medication to a new one.” (P10, female, 64yrs, residence 32 yrs, stroke 8yrs)

Traditional Chinese Medicine

Traditional Chinese Medicine (TCM), rooted in Chinese culture, could also have an important influence on self-care maintenance. Although they took prescribed Western medications, half the participants embraced TCM beliefs and practices. In TCM, emotions and physical health are intimately interrelated. Participants believed that maintaining a positive attitude was beneficial for their heart disease recovery, and they attached great importance to maintaining emotional well-being.

“You are in a good mood when you go outside and have fun. It is hard to get depression in Australia. Without depression, doesn’t your heart feel comfortable?” (P8, male, 71yrs, residence 3yrs, CHD 6 yrs)

By contrast, some TCM beliefs served as barriers to participants engaging in self-care maintenance and management. For example, some participants endorsed the TCM belief that bed rest is essential for patients with heart disease to recover, which contradicted exercise

recommendations. One way to accommodate these contrasting recommendations was through Tai Chi. An accepted part of TCM, Tai Chi was a culturally acceptable physical activity that could provide participants a route to establish exercise routines.

Another element of TCM involved herbal medicines. Regarding them as efficacious and harmless, over one-third reported taking herbal medications to manage their heart disease and one-quarter used them as first-line medications for relieving angina. These experiences and perceptions regarding herbal medicines could hinder adherence to Western medication regimes and complicate their cardiac self-management. Firstly, the CVD treatment processes and clinical practice guideline recommendations in Australia are different from China where integrating TCM and Western medication in treating CVD may be common practice. This inconsistency can generate misunderstanding and distrust between clinicians who follow CVD practice guidelines in Australia and Chinese patients retaining beliefs and practices in TCM, further compromising therapeutic relationships and adherence.

“He [Australian doctor] asked me to take the aspirin or something...I ...did not take it. Because...my wife heard from some traditional Chinese medicine doctors who said I did not have to take it. My wife suggested me to take some traditional Chinese patent medicines.” (P11 male, 61yrs, CHD 3yrs)

Secondly, some participants self-prescribing TCM did not disclose this to their Australian clinicians. Without professional instruction, potential medication interactions or contradictions between Western medication and TCM could complicate their medication regimes. One participant taking TCM for managing her cardiac symptoms presented with side effects.

“I feel I should do [see my general practitioner] that after trying the Chinese herbs. It does...have some side effects, as I have started to have stomach pain after taking it for a while...It hurts my stomach, because it is strong medicine. Even my skin has become dry and chapped.” (P17, female 68 yrs, CHD 6yrs)

Thirdly, participants in this study used TCM (Suxiao jiuxin Pill) to self-manage their acute angina episode, which is not in line with their prescribed management (self-administration of nitro-glycerine) from their Australian clinicians. There is consequently a risk that the use of TCM can mask patients’ cardiac symptoms and delay the initiation of effective and timely treatment of their angina or heart attack, which could be life-threatening.

"Nitroglycerin does not work for me. I carry a different medication that I brought from China, called fast-acting heart rescue pills [Suxiao jiuxin Pill]. It is traditional Chinese medicine. But because it works so well, I really trust it." (P16, male, 76yrs, residence 3 yrs, CHD 7yrs)

Financial issues including health insurance

Many participants were aware of the central role of the Australian Medicare national insurance system in funding cardiac care, especially those who had experienced hospitalisation. Medicare subsidies relieved their economic and mental stresses to a large extent which promoted their engagement in acute medical treatments and overall self-care behaviours.

6.5.2.4 Theme four: New living environment and self-care

Nearly half the participants praised the Australian environment compared to China, citing its good air quality, nice weather, comfortable temperature and food safety. They believed these improvements in their living environment contributed to their emotional well-being and favoured their overall heart disease self-care.

"I feel living in Australia is a better choice for me in terms of my heart disease. Because the air quality in Australia is quite good." (P10, female, 64yrs, residence 32yrs, stroke 8yrs)

6.6 Discussion

To our knowledge, this is the first study to comprehensively explore and identify the domains of acculturation experiences influencing self-care behaviours among first-generation Chinese immigrants living with CVD in Australia. The influence of acculturation on CVD self-care behaviours was shown to be complex, individualised and multifaceted. The specific domains of acculturation experiences, encompassing cultural practices, cultural values, healthcare systems utilisation and new living environment, mainly affected cardiac self-care maintenance. Both retaining their Chinese culture and integrating with Australian culture in dietary practices, social

networks, traditional values and family relationships served as enablers and barriers to self-care maintenance behaviours such as adherence to medications, heart-healthy diets and physical activity, and stress management. Language barriers could prevent cardiac Chinese immigrants from accessing acute care services and obtaining CVD health information from mainstream sources. Although many participants denied the presence of access barriers to primary care services and some praised the healthcare system in Australia, some preserved beliefs and practices in Traditional Chinese Medicine may complicate their medication adherence and self-care management, particularly in response to acute angina.

Although retaining their Chinese dietary habits, the integration of some Western foods into meals was prevalent among these Chinese immigrants. This was well-supported by prior studies conducted in the US, Spain, Australia and Canada, showing that Chinese immigrants shifted to Western-style breakfasts (milk, cereal and bread) and increased consumption of red meat and sugar over the course of acculturation(Lee et al., 2022; Zou et al., 2022). Post-migration diet practices in our study both enabled and deterred adherence to heart-healthy diets in this population, depending on their individualized acculturation experience. Accordingly, it is essential for clinicians to assess Chinese immigrants' dietary acculturation experiences before offering generic recommendations. To improve adherence to dietary regimens, heart-healthy Chinese eating habits could be reinforced by clinical practitioners. Efforts need also be undertaken to encourage selective adoption of healthy Western foods.

Consistent with previous findings on social relations among Chinese immigrants in the US, Spain and Australia, our study showed that this population affirmatively maintained strong ties with ethnic communities and relied heavily on Chinese community associations for coping with acculturation stress and obtaining settlement resources (Badanta et al., 2021; Chun et al., 2011; Xiao et al., 2023). Rather than attending gyms, many participants in this study preferred group-based exercises such as dancing and Tai Chi. This could be partially attributed to Chinese community associations regularly organizing such group-based physical activities. Moreover, these community associations supported participants in adopting heart-healthy lifestyles by providing health talks on nutrition, which these participants appreciated. Thus, future partnerships between healthcare providers and Chinese community associations offer an opportunity to develop and deliver culturally and linguistically appropriate community-based CVD health education programs for Chinese immigrants to improve their cardiac self-care behaviours.

Language was a major barrier for Chinese immigrants to access acute health services, but less so for primary and specialist care. This was confirmed in a systematic review (Zhang et al., 2018) and can be explained by participants self-selecting Mandarin-speaking general practitioners and cardiologists but having no choice of acute care health professionals. Language barriers also prevented Chinese immigrants from accessing CVD health information from mainstream sources. This was strongly supported in other studies flagging the lack of culturally and linguistically appropriate heart health information for Chinese immigrants living with CVD (Li et al., 2018; Zeng et al., 2023). Participants' use of Chinese community associations offers the opportunity to partner for co-design and delivery of culturally sensitive CVD health education programs.

Traditional values and family relationships, particularly filial piety, were important influences. Other studies have shown older Chinese immigrants to be vulnerable to depressive symptoms, attributed to acculturation stress (Fang et al., 2021; Xu et al., 2023). In our study, family conflicts stemming from unmet filial piety expectations from adult children undermined older Chinese immigrants' mental well-being and resulted in social isolation. This was also seen in previous studies (Guo et al., 2020, 2022). Although some cultural philosophies endorsed by Chinese immigrants were beneficial to self-management of stress, the typically reserved emotional habitus of Chinese cultures can deter professional help-seeking for mental support and has been blamed for the low utilisation of mental health services. Clinicians should be aware of the potential impact of such issues and consider assessment of Chinese immigrants' mental health, with referral for culturally sensitive psychological support, as appropriate.

Chinese immigrants in this study accessed primary care services, particularly general practitioners, for their CVD management. This is inconsistent with other studies showing low utilisation of primary care services among this population (Badanta-Romero et al., 2021; Xiao et al., 2023). This can perhaps be explained by this population living in ethnic-enclave neighbourhoods where Mandarin-speaking health practitioners are available. However, study participants were unfamiliar with ways to access allied health services, resulting in low use of dietitians and cardiac rehabilitation. This presents an opportunity to investigate avenues to improve access to these specialist services, to support cardiac self-care management.

Although Chinese immigrants were broadly adherent to physician-prescribed cardiac medications, many used TCM as adjuvant or first-line medication, such as heart rescue pills (Suxiao jiuxin Pill) to manage acute angina. This finding differs from a previous study, where TCM was solely taken as a second choice for treating CVD (Jin et al., 2020). Several considerations may explain this. In our study, 30% of participants received their CVD diagnosis and initial

treatment in China, which may have familiarised them and established a habit of TCM. Further, some participants were told by their Chinese social networks to take TCM to self-manage their angina episodes. The use of TCM can complicate and mask angina symptoms, delaying help-seeking to manage their angina. Clinicians should assess the use of TCM in this population, particularly for those initially diagnosed with CVD in China. Health education on first response management of acute cardiac or stroke events is urgently needed for Chinese immigrant populations.

Study limitations included that participants were recruited solely from the Sydney area and responses may not represent the experiences of Chinese immigrants living elsewhere. Participants were recruited from social media, Chinese community associations and medical centres in Chinese-enclaved areas, which may exclude marginalised older Chinese immigrants who had low digital literacy or lived in regional, rural or remote areas. The inclusion criterion that required participants to speak English or Mandarin excluded immigrants who only spoke Cantonese. Social desirability and self-selection bias may have affected the interview data, and recall bias may have influenced accounts of their CVD diagnosis and self-care behaviours. Finally, transcripts were not shared with participants for member-checking as they had been translated into English.

6.7 Conclusions

The role of acculturation in relation to CVD self-care behaviours among Chinese immigrants is multifaceted and individualized. For clinicians and community health workers, to avoid stereotypical responses and enable culturally appropriate and responsive practice, it is necessary to evaluate their patients' acculturation experiences regarding cultural practices and values, and adaptation to new healthcare systems. Their cardiac medical history and use of TCM should be assessed by health practitioners to improve Chinese immigrants' medication adherence and safety. Family relationship plays an essential role in the CVD self-care of Chinese immigrants and where possible family members should be involved in patients' treatment plans and heart-healthy lifestyle education. For health organizations and policymakers, the lack of culturally and linguistically appropriate CVD health information in the community compromises Chinese immigrants' CVD self-care behaviours, and should be addressed urgently via policy development and local service delivery. Collaboration with Chinese community associations offers an opportunity for co-design and dissemination of information about Australian

healthcare systems and CVD health education to upskill CVD self-care practices and mitigate the health inequities experienced by Chinese immigrants in Australia.

6.8 Chapter summary

This chapter addressed objectives 3 and 4 of this thesis by conducting interviews, contributing new knowledge on identifying the acculturation experiences of Chinese Australians living with CVD, and investigating the impact of acculturation on self-care behaviours reported among Chinese Australians living with CVD. The main findings are listed below:

- The acculturation experiences of these Chinese participants were complex, individualised and multifaceted. In general, they predominantly continued to espouse Chinese culture whilst also, to some extent, learning or adapting to Australian culture, such as dietary acculturation.
- The specific domains of acculturation experiences affecting participants' CVD self-care mainly encompassed cultural practices, cultural values, healthcare systems utilisation and new living environment.
- Both retaining Chinese culture and integrating with Australian culture in dietary practices, social networks, traditional values and family relationships served as enablers and barriers to CVD self-care behaviours, particularly in self-care maintenance where this related to adherence to medications, heart-healthy diets and physical activity, and stress management.
- Although many participants denied any difficulty in utilising primary care services and some praised the healthcare system in Australia, language barriers could prevent these Chinese immigrants from accessing acute care services and obtaining CVD health information from mainstream sources. Some preserved beliefs and practices in Traditional Chinese Medicine can complicate medication adherence and self-care management in response to acute angina.

Chapter 7 Phase Two Quantitative Results: Acculturation Experiences and Related Self-care

7.1 Chapter introduction

This chapter reports findings from the phase two quantitative study, which used a survey design to examine the level of acculturation among first-generation Chinese immigrants living with CVD and to investigate the association between acculturation and CVD self-care. These study findings address the following objectives of this thesis:

3. To survey participants to identify the acculturation experiences of Chinese Australians living with CVD.
4. To survey participants to investigate the impact of acculturation on self-care behaviours reported among Chinese Australians living with CVD.

7.2 Results

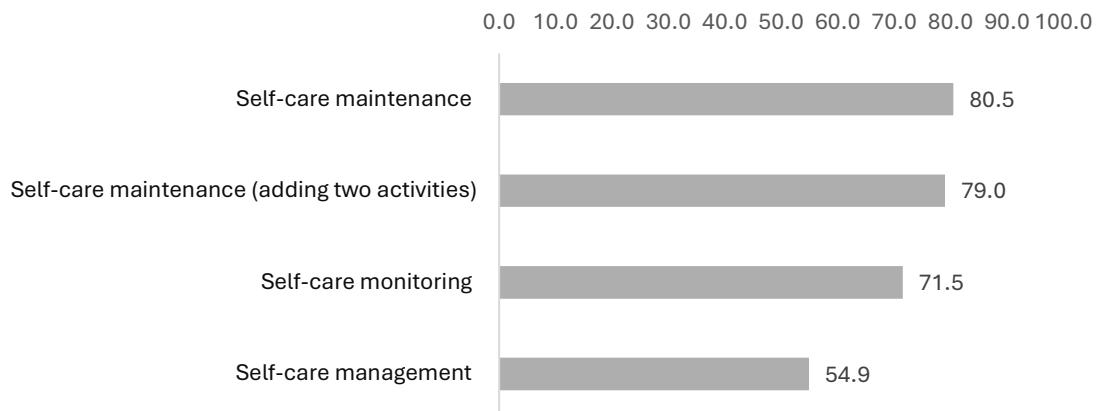
7.2.1 Participants' demographic and clinical characteristics

The sociodemographic and clinical characteristics of the sample were described in Chapter 5 in Section 5.2.1.

7.2.2 Participants' CVD self-care behaviours

Participants' CVD self-care behaviours were described in detail in Chapter 5 in Section 5.2.2 and are only briefly summarised here to address the objectives of the study described in this chapter. For the entire sample, the mean (SD) self-care maintenance score was 80.5 (15.8). After adding two interview data-derived activities (sleep and avoiding triggers), the mean (SD) self-care maintenance score was 79.0 (15.1). The mean (SD) self-care monitoring score was 71.5 (20.1), and self-care management was 54.9 (20.8) (Figure 7-1).

Figure 7-1 Participants' mean scores of three CVD self-care subscales (n = 260)



7.2.3 Participants' levels of acculturation

7.2.3.1 Proxy acculturation measures

Age at migration, residence duration and English language proficiency were used as proxy acculturation measures. The mean (SD) age of the sample at migration was 55.1 (13.0) years. Participants had been residents in Australia for 16.7 (11.4) years but almost half (41.2%) could not speak any English (Table 7-1).

7.2.3.2 SL-ASIA scores

For the SL-ASIA scale with four subscales, the overall mean score for all participants for the original 21-item version of the scale was 1.8 (maximum 5), which indicates low acculturation levels. The SL-ASIA cultural values subscale (items 22 and 23) classified the participants based on their beliefs in Chinese and Australian cultures. Two-thirds of participants self-identified as maintaining Chinese values, and one-third identified with bicultural values. In the behavioural competency subscale (items 24 and 25), more participants fit in Chinese (78.3%) compared to bicultural (19.2%) cultural groups. In the cultural identity subscale (item 26), 70.6% of participants identified themselves as Chinese (Table 7-1).

Table 7-1 Acculturation measures and scores of participants (n = 260)

	N	Overall %
Proxy acculturation measures		
Age at migration, years (mean, SD)	55.1	13.0
Residence duration, years (mean, SD)	16.7	11.4
English proficiency		
None	107.0	41.2
A little	101.0	38.8
Good	48.0	18.5
Suinn-Lew Asian Self-Identity Acculturation scale (SL-ASIA scale)		
21-item SL-ASIA scale (mean, SD)	1.8	0.3
SL-ASIA scale values		
Chinese identified	149.0	61.8
Bicultural identified	84.0	34.9
Australian identified	8.0	3.3
SL-ASIA scale behavioural competency		
Chinese identified	188.0	78.3
Bicultural identified	46.0	19.2
Australian identified	4.0	1.7
Alienated	2.0	0.8
SL-ASIA scale self-identity		
Chinese self-identified	175.0	70.6
Bicultural identified	71.0	28.6
Australian self-identified	2.0	0.8
Bicultural Efficacy in Health Management Scale (BEFF-HM scale) (mean, SD)	33.6	4.4
Traditional Chinese Medicine Belief Scale (TCM belief scale)(mean, SD)	3.4	0.6

Figure 7-2 Participants' mean scores of each item of the BEFF-HM scale (n = 260)



7.2.3.3 BEFF-HM scale scores

For the BEFF-HM scale, participants reported a mean score of 33.6 (maximum 40), which indicates that overall, they perceived high self-efficacy in coping with acculturation stressors relating to their health management (Table 7-1). With the exception of one item (item 10), dealing with a new language (mean score 1.83), overall, participants reported high self-efficacy (a range of 3.4–3.7; maximum 4) in items assessing the maintenance of family and social relations (items 1–3), healthcare system use (items 4–7) and new lifestyle adaptation in Australia (items 8–9) (Figure 7-2).

7.2.3.4 TCM belief scale scores

Overall, participants' held attitudes scored as neutral to slightly agreeing with TCM beliefs with a mean score of 3.4 (where a score of 3 indicated neither agree nor disagree and 5 indicated strong agreement) (Table 7-1).

7.2.4 Associations between acculturation and CVD self-care behaviours

7.2.4.1 Acculturation and self-care maintenance

In the univariate regression model (Table 7-2), only age at migration and TCM belief scale scores were significantly associated with self-care maintenance ($p < 0.05$). After adding the two interview-derived extra activities to the original self-care maintenance subscale, the BEFF-HM scale was also significantly associated with the self-care maintenance score.

In the multivariable model (Table 7-2), only age at migration ($\beta = 0.48$, 95% CI: 0.18, 0.78) was positively associated with self-care maintenance. After adding the two activities to the original self-care maintenance subscale, migration at an older age ($\beta = 0.49$, 95% CI: 0.21, 0.77) and perceived higher self-efficacy in addressing acculturation stressors impacting health management (BEFF-HM scale score) ($\beta = 0.54$, 95% CI: 0.05, 1.02) were significantly associated with higher CVD self-care maintenance.

Table 7-2 Associations between acculturation and CVD self-care behaviours

Model: Variable	Self-care maintenance		Self-care maintenance (Two activities added) ¹		Self-care monitoring		Self-care management	
	Univariate	Multivariable ²	Univariate	Multivariable	Univariate	Multivariable	Univariate	Multivariable
	β	β	β	β	β	β	β	β
	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI
Age at migration	0.25* (0.01, 0.49)	0.48** (0.18, 0.78)	0.15* (0.01, 0.30)	0.49*** (0.21, 0.77)	0.01 (-0.18, 0.21)		0.15 (-0.05, 0.36)	
Residence duration	-0.20 (-0.48, 0.07)		-0.07 (-0.24, 0.09)		-0.09 (-0.32, 0.13)		-0.14 (-0.37, 0.10)	-0.61* (-1.11, -1.12)
English proficiency								
Not at all (ref) ³								
A little	2.20 (-4.35, 8.75)		0.49 (-3.79, 4.77)		-0.32 (-5.98, 5.35)	-2.57 (-8.87, 3.37)	0.51 (-5.39, 6.42)	
Good	-5.42 (-14.98, 4.15)		0.48 (-4.92, 5.89)		-2.09 (-9.31, 5.12)	-15.39* (-27.11, -3.66)	-0.48 (-7.97, 7.02)	
21-item SL-ASIA ⁴	-3.77 (-15.72, 8.17)		-1.39 (-8.79, 6.02)		-1.06 (-11.16, 9.04)		-1.52 (-12.03, 8.99)	
SL-ASIA cultural values								
Chinese identified (ref)								
Bicultural identified	-4.79 (-10.93, 1.35)		-1.29 (-5.18, 2.60)		-0.25 (-5.59, 5.10)		2.49 (-3.19, 8.16)	
SL-ASIA behavioural competency								
Chinese identified (ref)								
Bicultural identified	-5.61 (-13.37, 2.14)		-3.32 (-8.10, 1.45)		-9.03** (-15.44, -2.62)		1.81 (-5.20, 8.82)	

Model: Variable	Self-care maintenance		Self-care maintenance (Two activities added) ¹		Self-care monitoring		Self-care management	
	Univariate	Multivariable ²	Univariate	Multivariable	Univariate	Multivariable	Univariate	Multivariable
	β	β	β	β	β	β	β	β
95% CI								
SL-ASIA cultural identity								
Chinese identified (ref)								
Bicultural identified	-4.24 (-11.12, 2.65)		-0.78 (-5.03, 3.46)		-4.06 (-9.70, 1.58)		-0.75 (-6.65, 5.15)	
BEFF-HM ⁵	0.59 (0.00, 1.17)		0.64** (0.24, 1.04)	0.54* (0.05, 1.02)	0.85** (0.27, 1.42)	1.22*** (0.55, 1.89)	0.67* (0.06, 1.28)	
TCM belief ⁶	-5.87* (-10.94, -0.79)		-4.06* (-7.37, -0.76)		-4.50 (-9.14, 0.14)		5.64* (0.94, 10.35)	9.19** (3.72, 14.66)

Note: ¹Adding sleep and trigger avoidance to original self-care maintenance subscale. ² All multivariable models: adjusted for gender, education level, living status, private insurance, years of diagnosis, hospital treatment and acculturation variables listed in the table. ³Ref: reference group

⁴21-item SL-ASIA: the Original 21 items Suinn-Lew Asian Self-Identity Acculturation scale. ⁵BEFF-HM: Bicultural efficacy in health management scale

⁶TCM belief: Traditional Chinese Medicine belief scale. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7.2.4.2 Acculturation and self-care monitoring

In the univariate regression model (Table 7-2), self-care monitoring was only significantly related to BEFF-HM scale score and SL-ASIA behavioural competency ($p < 0.05$). In the multivariable model (Table 7-2), only perceived higher self-efficacy in coping with acculturation stressors affecting health management (BEFF-HM scale scores) (95% CI: 0.55, 1.89) were associated with a 1.22 higher score in CVD self-care monitoring, while participants with good English proficiency (95% CI: -27.11, -3.66) had 15.39 lower self-care monitoring scores than participants without English proficiency ($p < 0.05$).

7.2.4.3 Acculturation and self-care management

In the univariate model (Table 7-2), higher scores in the BEFF-HM scale score and the TCM belief scale score were significantly associated with better self-care management ($p < 0.05$). In the multivariable model, stronger beliefs in TCM (95% CI: 3.72, 14.66) remained significantly associated with 9.19 higher self-care management. Longer residence duration (95% CI: -1.11, -1.12) was linked to a 0.61 lower self-care management score.

7.3 Chapter summary

This chapter addressed objectives 3 and 4 of this thesis by conducting a study using survey design that contributes new knowledge by identifying the acculturation experiences of Chinese Australians living with CVD and investigating the impact of acculturation on self-care behaviours reported among Chinese Australians living with CVD. The main findings are:

- Chinese immigrants in this sample reported low levels of Western acculturation in terms of language proficiency and total scores for the SL-ASIA scale.
- The participants simultaneously perceived high self-efficacy in coping with acculturation stressors affecting their health management. They held nearly neutral attitudes in endorsing TCM.
- The relationship between proxy acculturation measures and CVD self-care indicated that a lower level of acculturation was associated with better CVD self-care behaviours.

- Perceived self-efficacy in coping with acculturation stress related to disease management was positively associated with CVD self-care, specifically in self-care maintenance and monitoring.
- Stronger belief in TCM was related to better CVD self-care management.
- The SL-ASIA score was not significantly linked to CVD self-care behaviours.

Chapter 8 Integration of Findings and Discussion

8.1 Chapter introduction

In this chapter, the two datasets generated using the phase one qualitative data and phase two quantitative data are synthesised to answer each research question. Key findings are discussed in relation to the existing body of evidence from the field. The study's strengths and limitations are highlighted in this chapter.

8.2 Research question 1: CVD self-care behaviours

What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, symptom monitoring and responses?

The main qualitative and quantitative findings regarding the CVD self-care behaviours reported by first-generation Chinese immigrants in Australia are listed together in Table 8-1. The qualitative and quantitative findings on CVD self-care behaviours are synthesised and grouped into three overarching themes: self-care maintenance, self-care monitoring and self-care management.

Table 8-1 Two dataset findings relating to CVD self-care among Chinese immigrants

Research question: What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, symptom monitoring and responses?	
Phase one qualitative main findings	Phase two quantitative main findings
Self-care maintenance	
Overall, many participants actively engaged in self-care maintenance.	<ul style="list-style-type: none">• The mean self-care maintenance score (with additional two activities) was 79.0; 77.1% achieved 'adequate' levels of self-care maintenance.
<i>Dietary practices</i>	
<ul style="list-style-type: none">• Many adapted heart-healthy diets: cooking style, taste preferences (less oil and salt), healthy ingredients (less red meat more fruits and vegetables).• Half maintained poor eating practices: fatty meat, deep-fried food, high-salt items, sugary snacks and big portions of food.• Some continued prior healthy eating practices: eating vegetables-based and light meals.	<ul style="list-style-type: none">• The mean score for adherence to eating fruits and vegetables was 4.6/5.0, and 81.8% ate fruits and vegetables daily.• The mean score for ordering for low fat foods when eating out was 3.7/5.0, and 46% always asked for low fat foods during social meals.
<i>Physical activities</i>	
<ul style="list-style-type: none">• Many developed exercise routines: walking (most common), Tai Chi, square dancing and playing ball games.• They exercised in their neighbourhoods or at Chinese community centres.• Some avoided strenuous exercise; they considered the appropriate intensity.• Some limited exercises or maintained physical inactivity.	<ul style="list-style-type: none">• The mean score for physical activity was 4.0/5, and 58.1% exercised daily.

Research question: What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, symptom monitoring and responses?

Phase one qualitative main findings	Phase two quantitative main findings
<i>Medication adherence</i> <ul style="list-style-type: none">Three-quarters consistently took their medications.Over one-third of participants incorporated TCM* for heart disease.A Suxiao jiuxin Pill was used as first-line for relieving angina.Over half self-administered dietary supplements coenzyme Q10 and fish oil.	<ul style="list-style-type: none">The mean score for taking prescribed medication without missing doses was 4.4/5.0, and 69.2% adhered to prescribed medication daily.35.1% took cardiac TCM, and the most common TCM for managing angina was 'Quick-acting heart reliever', which 19.2% used.The mean score for taking blood thinners was 3.4/5.0, and 52.7% took blood thinners daily.
<i>Stress management</i> <ul style="list-style-type: none">Rather than seeking professional support, many self-managed stresses and cited personal values, cultural philosophies, self-distraction and social support.A few had no skills in stress management.	<ul style="list-style-type: none">The mean score for doing something to relieve stress was 3.9/5.0, and 41.9% always managed their stress.
<i>Medical follow-ups</i> <ul style="list-style-type: none">Most consistently attended medical follow-up appointments.	<ul style="list-style-type: none">The mean score for keeping appointments with healthcare providers was 4.6/5.0, and 78.9% always attended medical follow-up appointments.
<i>Seeking health information</i> <ul style="list-style-type: none">Three-quarters sought Chinese resources and cited websites, news feeds and WeChat, social networks, printed materials and health talks at Chinese community centres.A few did not seek health information.A strong desire was expressed for more heart health information.	<ul style="list-style-type: none">51.4% only searched for heart health information from Chinese resources, such as Chinese websites, Chinese social networks and physical books brought from China. 25.9% searched for heart health resources from Western websites, hospital health booklets or heart health talks in Chinese community centres.Only 28.5% felt confident in their heart health knowledge.Only 11.6% were able to very quickly recognise heart-related symptoms.In the open text, some reported a lack of heart health education and requested heart health information in Australia.

Research question: What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, symptom monitoring and responses?

Phase one qualitative main findings	Phase two quantitative main findings
<i>Sleep and rest patterns</i> <ul style="list-style-type: none">• Many reported broken or light sleep.• Few slept well at night.• Half took a nap after lunch.	<ul style="list-style-type: none">• The mean score for making sure to get good rest (such as sleeping well at night) was 3.6/5.0, and only 21.2% were always well rested.
<i>Drinking and smoking behaviours</i> <ul style="list-style-type: none">• Many reported not drinking or smoking.• Some cut down to small or moderate amounts.• One had not quit smoking but had cut down the amount smoked.	<ul style="list-style-type: none">• The mean score for avoiding smoking or smokers was 4.5/5.0, and 86.1% neither smoked nor were second-hand smokers.
<i>Flu vaccination</i> <ul style="list-style-type: none">• More than three-quarters complied with vaccination recommendations.	<ul style="list-style-type: none">• The mean score for avoiding getting sick (such as getting flu vaccinations) was 4.6/5.0, and 77.3% always protected themselves from getting sick.
<i>Avoiding triggers of angina</i> <ul style="list-style-type: none">• Some were vigilant in relation to physical exertion, cold weather, dehydration, heavy workloads.	<ul style="list-style-type: none">• The mean score for avoidance of angina triggers was 4.2/5.0, with 52.9% always being vigilant to avoid triggers that worsened their heart condition.
Self-care monitoring	
Overall, participants actively engaged in self-care monitoring.	<ul style="list-style-type: none">• The mean self-care monitoring score was 71.5, and 63.1% achieved 'adequate' levels of self-care monitoring.

Research question: What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, symptom monitoring and responses?

Phase one qualitative main findings	Phase two quantitative main findings
<i>Interpreting bodily symptoms</i> <ul style="list-style-type: none">• Many were vigilant in monitoring somatic change.• Some correctly interpreted heart symptoms, both typical and atypical.	<ul style="list-style-type: none">• The mean score for monitoring body condition was 4.3/5.0, and 55.9% always checked their body condition.• The mean score for paying attention to changes in how they felt was 4.3/5.0, and 57.4% were always cautious about changes in how they felt.• The mean score for monitoring fatigue was 4.2/5.0, and 56.4% always monitored their fatigue levels.• The mean score for monitoring body symptoms was 4.3/5.0, and 56.2% always monitored their body symptoms.• Only 11.6% reported being able to very quickly recognise heart/stroke-related symptoms such as chest pain, shortness of breath and chest pressure.
<i>Checking body signs</i> <ul style="list-style-type: none">• Less than half frequently checked blood pressure, blood sugar and clotting values.• Many tracked weight changes over time.	<ul style="list-style-type: none">• The mean score for checking blood pressure was 3.3/5.0, and 25.6% always checked their blood pressure.• The mean score for checking body weight was 32.9/5.0, and 12.1% always checked their weight.
<i>Medication monitoring</i> <ul style="list-style-type: none">• Over half vigilantly monitored medication effectiveness and side effects.	<ul style="list-style-type: none">• The mean score for monitoring medication side effects was 3.7/5.0, and 36.6% always monitored for side effects.
Self-care management	
Overall, self-management of cardiac symptoms was poor.	<ul style="list-style-type: none">• The mean self-care management score was 54.9, and 20.8% achieved 'adequate' levels of self-care management.

Research question: What self-care behaviours are practised by Chinese immigrants with CVD in Australia, including lifestyle modification, medication adherence, symptom monitoring and responses?

Phase one qualitative main findings	Phase two quantitative main findings
<i>Heart symptom management</i> <ul style="list-style-type: none">• Over half would rest immediately and take nitroglycerin or TCM.• Some made an appointment to consult doctors.• A few accessed hospital services immediately.• A few consulted doctors but waited until the next follow-up.• Some with newly diagnosed or mild symptoms would take no action.	<ul style="list-style-type: none">• The mean score for changing activity levels to manage cardiac symptoms was 4.0/5, and 67.2% were very likely to take this action.• The mean score for taking an aspirin to manage cardiac symptoms was 1.5/5, and only 7.6% were very likely to take this action.• The mean score for taking medicine to relieve cardiac symptoms was 3.6/5, and 58.4% were very likely to take this action.• The mean score for accessing healthcare services (calling a doctor) was 3.6/5, and 57.1% were very likely to take this action.• The mean score for telling doctors about their cardiac symptoms at next visit was 2.8/5, and 39.3% were very likely to take this action.• The most common form of TCM taken to manage angina symptoms was 'Quick-acting heart reliever', which 19.2% were using.
<i>Bodily signs management</i> <ul style="list-style-type: none">• Some consulted doctors on changed body signs.• Some self-adjusted medication.	
<i>Medication management</i> <ul style="list-style-type: none">• Some consulted doctors on medication effectiveness and side effects.• Over half self-adjusted their medication.• Some rationalised medication side effects and managed them under instruction.	

*Note: *TCM: Traditional Chinese Medicine.*

8.2.1 Theme: Self-care maintenance

In general, from the qualitative interview findings, many Chinese participants willingly engaged in self-care maintenance for their CVD. This was further confirmed in the quantitative survey findings, which indicated that 77.1% achieved adequate levels of CVD self-care maintenance.

Using the same CVD self-care measurement, participants in this study performed better in self-care maintenance (with a mean score of 79.0) compared to cardiac participants in Italy, with a mean score of 58.3 (Di Matteo et al., 2024) and in Iceland with score 61.6 (Ingadóttir et al., 2024). This may be due to the unique characteristics of the sampled population in this study, such as being older and unemployed or retired, which perhaps indicates they had more experience and a greater time available to manage their CVD. By contrast, a recent study (Shi et al., 2024) showed inadequate self-care behaviours among Chinese immigrants with coronary heart disease in Australia. This inconsistency can likely be attributed to the use of different measures used to assess differently conceptualised domains of CVD self-care behaviours. In Shi et al.'s study, the CVD self-care behaviours were measured in the three domains of emotional self-management, daily life self-management and medical self-management. Moreover, participants in this study by Shi et al. (2024) were recruited from cardiac rehabilitation centres following their percutaneous coronary intervention and/or coronary artery bypass graft surgery, which indicates that these Chinese participants had been newly diagnosed with CVD or at least newly referred to rehabilitation; this flags that they needed help in managing their CVD condition. By contrast, the participants of this current study were recruited from community settings with an average CVD disease duration of nearly 7 years; this longer duration of living with CVD may have allowed them more time to accrue knowledge and experience in managing CVD.

8.2.1.1 *Dietary practices*

Qualitative findings elaborated on the diverse and mixed dietary practices of these Chinese participants following their diagnosis of CVD. There were grouped into adaptation to heart-healthy diets, maintenance of poor eating practices and continuance of previous healthy eating practices. Many participants partially adapted to heart-healthy diets, such as by increasing their consumption of fruits and vegetables and reducing red meat and fatty meat intake. It was confirmed in quantitative findings that many participants reported eating fruits and vegetables daily. However, some participants in the qualitative study maintained some poor eating practices rather than following recommendations, such as eating fatty meat and high-salt items. The quantitative findings complemented the interviews that indicated participants' poor

adherence to a low fat diet when eating out. Some participants preferred eating vegetables and light meals and simply continued their previous healthy eating practices following their diagnosis of heart disease.

Many Chinese participants in this study actively adjusted their dietary practices for their heart health following their CVD diagnosis, which was consistent with the findings of two other qualitative studies conducted among Chinese immigrants with CVD in Canada (King et al., 2007) and Australia (Jin et al., 2020). However, these culturally grounded dietary practices are not necessarily equivalent to adhering to an evidence-based heart-healthy diet in Western society. When asked about the specific amount of fruit and vegetables consumed per day, Chinese participants with CVD reported eating fewer than three servings of fruit and vegetables; the Australian guidelines recommend two servings of fruit and five servings of vegetables (Shi et al., 2024). Many participants in this study selectively adapted part of a heart-healthy diet while still maintaining some poor dietary practices. This can perhaps be blamed on poor health knowledge and a lack of skill in applying evidence-based heart-healthy dietary recommendations in daily meal planning. Thus, it would be reasonable for clinicians to assess the knowledge of heart-healthy diets and dietary habits of Chinese participants before giving them dietary guidance. Clinicians could reinforce the heart-healthy components of their dietary habits and encourage them to change their poor dietary habits by offering culturally appropriate suggestions. Considering limited consultation time, it might be helpful for clinicians to provide this population with printed or digital versions of heart-healthy culturally appropriate dietary brochures or to collaborate with non-governmental, volunteer, charity or community-based agencies to provide this information.

8.2.1.2 Physical activities

The qualitative and quantitative findings both indicated that many participants actively engaged in exercise routines following their CVD diagnosis, while others limited the amount and types of exercise they undertook or maintained a state of physical inactivity. The qualitative findings expanded on details of the locations and types of exercise performed by these participants. Walking was the most popular physical activity, followed by group-based Tai Chi, square dancing and playing ball games. Most exercised in their neighbourhoods and at Chinese community associations. Notably, some participants were cautious about the intensity of the exercise that they undertook to avoid triggering angina.

Many participants in this study reported establishing daily exercise routines, which is similar to the findings of previous studies (King et al., 2007; Zeng et al., 2023). However, in a recent study (Shi et al., 2024), when asked about their amount of exercise, only 17.19% of the sampled Chinese immigrants with CVD achieved the recommended moderate-intensity exercise per week, and the average daily step count was only 4,848, which was lower than the suggested 7,000–10,000 steps. This can be partially explained by participants' insufficient health knowledge in relation to nationally recommended levels of physical activities among this population (Shi et al., 2024). Interestingly, this study revealed that Chinese community associations played a significant role in promoting physical exercises for older Chinese immigrants. Thus, collaborating with Chinese community associations to deliver exercise-related health talks and programs could be a way to educate and encourage Chinese immigrants to achieve guideline-recommended exercise intensity.

8.2.1.3 Medication adherence

Regarding prescribed Western medications, the qualitative and quantitative findings were similar in that nearly 70% of participants reported consistently adhering to prescribed cardiac medications. The quantitative findings indicated that adherence was poor for anticoagulant agents among these Chinese participants. Qualitative and quantitative findings also concurred that it was common (nearly one-third) for these participants to incorporate TCM to manage their CVD, particularly by taking the Suxiao jiuxin Pill as a first-line medication to relieve their angina. In addition, qualitative findings also showed that the self-administration of dietary supplements such as fish oils and coenzyme Q10 tablets was ubiquitous among these participants for their perceived CVD health benefits.

In line with a previous study (King-Shier et al., 2017), many of the current study participants reported that they generally took prescribed cardiac medications consistently. However, when asked specifically, only half of the participants took anticoagulant medications exactly as prescribed, and some participants were prone to self-adjust their medications when experiencing heart symptoms or side effects from the medications. This identifies a crucial need for clinicians to comprehensively assess patients' adherence to each of their cardiac medications. Given the time constraints of most specialists and general practice consultations and the experiences being reported with other chronic disease groups, community pharmacists may have a role to play in this (Ensing et al., 2015; Janjua et al., 2023; Mekonnen et al., 2016;

Rodrigues et al., 2017). The use of TCM for managing CVD conditions was common among the sampled population, which is consistent with previous studies (Jin et al., 2020; King-Shier et al., 2017). Particularly, participants used TCM (Suxiao jiuxin pill) as the first-line medication for relieving acute heart symptoms, which was a new finding from this study. This may be partially explained by the fact that some participants had their CVD initially diagnosed and treated in China, where TCM is prescribed by Chinese physicians to treat heart disease. Although it is a commonly prescribed medication by physicians in China, high quality clinical trial evidence evaluating the efficacy and safety of the Suxiao jiuxin Pill is lacking (Sun et al., 2024). Thus, clinicians should be culturally sensitive when assessing Chinese immigrants' medication histories, particularly for those whose CVD was initially diagnosed and treated in China. It is highly recommended that the medication history checklist should routinely include questions specifically asking about the use of TCM, such as the medication brand, the form of TCM (traditional Chinese herbs or patent medication), route of administration, dose and frequency, duration and the indication for using TCM.

8.2.1.4 Stress management

Many participants had adopted strategies to manage their stress, which was confirmed both in qualitative and quantitative findings. Qualitative findings further elaborated on the stress-related coping skills used by these Chinese participants, such as keeping in touch with their personal values and the cultural philosophies that they espoused, living in the present and letting go of thoughts. They also used self-distraction techniques (such as reading and watching TV), sought support from social networks and joined Chinese community activities. However, few sought professional help or consultation or used mental health services, and a few participants confessed that they did not know how to address their emotions appropriately.

Similar to previous findings (Minas, 2021, pp. 225–243), the use of mental health services provided in the host society was suboptimal among the Chinese immigrants in this study. This could be due to the stigma of mental health problems in China, where being stoic and reserving personal emotion are culturally rooted. Thus, participants may feel reluctant to request a referral from primary care physicians. Moreover, they may lack access to culturally and linguistically appropriate mental health service information (Chao et al., 2020). Thus, it is important for clinicians to be aware of Chinese patients' mental health status and to teach them

stress-related coping strategies or refer them to culturally and linguistically appropriate mental health services to improve their engagement with CVD self-care practices.

8.2.1.5 Seeking health information

In both datasets, many participants reported searching for Chinese-language CVD-related health information from various sources—such as Chinese websites, Chinese social networks and physical books brought from China—but they also expressed a strong desire for Australian-based CVD health information to be available to them. This was complemented by the quantitative findings, in which many participants reported not feeling confident in their heart or stroke health knowledge and failed to quickly recognise the symptoms of a heart attack or stroke.

Many Chinese participants reported insufficient confidence in their CVD health knowledge and lacked access to health information from mainstream sources due to language and cultural barriers. This was similar to other studies that have explored health information-seeking behaviours among Chinese immigrants in the US and Australia (Qian & Mao, 2021; L. Zhang et al., 2023). Thus, they tended to search for CVD-related health resources from Chinese websites (WeChat or Baidu), which were neither verified nor in line with Australian clinical guidelines. This mismatched information between Chinese patients and clinicians in Australia may compromise the patients' ability to practice evidence-based CVD self-care behaviours. During the interviews, some participants expressed a strong desire for detailed and customised health information, as the health guidance provided by their healthcare providers was described as generic and too broad. Therefore, it is highly recommended that clinicians assess Chinese immigrants' CVD-related health knowledge and refer them to appropriate health services or resources. However, current culturally and linguistically appropriate CVD health education programs and resources are in limited supply, and further resource development is urgently needed for this population.

8.2.1.6 Sleep and rest patterns

During the interviews, many participants reported having difficulty maintaining good sleep patterns and experienced only broken or light sleep. This was consistent with survey findings, where only 21.2% of participants reported always being well rested.

These findings were also common to other studies, which demonstrates that sleep quality is an important factor influencing CVD self-care behaviours (Ryou et al., 2021; Spedale et al., 2023). Notably, few participants in this qualitative study reported accessing health services in relation to their sleep issues. Thus, it is important for clinicians to assess Chinese patients' sleep quality. Further, information on sleep hygiene skills should be included with CVD self-care education to support patients living with CVD to improve their CVD self-care practices.

8.2.1.7 Other self-care maintenance behaviours

The qualitative findings indicated a high adherence to medical follow-up appointment attendance. This was further confirmed by the quantitative findings, which revealed that 78.9% of participants reported always attending medical follow-up appointments.

Qualitative findings revealed that a small number of participants who had previously reported the habit of drinking had cut down their alcohol consumption following their heart disease diagnosis. In terms of smoking, quantitative findings identified that many (86.1%) participants reported that they neither smoked themselves nor were exposed to second-hand smoke. This was consistent with the qualitative findings, where only two participants reported smoking concerns.

Both sets of data indicated that most Chinese participants took care to protect themselves from getting sick, for example, by getting flu vaccinations.

Both qualitative and quantitative findings confirmed that some participants were extra cautious about situations that might trigger the onset of their angina symptoms and tried to avoid them. These situations included physical exertion, cold weather, dehydration and heavy workloads.

In summary, Chinese participants in this study reported performing well in attending medical follow-up appointments, controlling smoking and drinking, getting vaccinations and avoiding situations that could potentially trigger angina symptoms.

8.2.2 Theme: Self-care monitoring

Overall, according to their narratives, Chinese participants actively engaged in CVD self-care monitoring behaviours. This was confirmed in survey findings, where the mean self-care

monitoring score was 71.5, and 63.1% of participants achieved levels of monitoring activities described as adequate.

For monitoring body symptoms, the qualitative findings revealed that participants were vigilant to somatic changes, and some were able to interpret the symptoms regarding angina or stroke episodes. This was partially consistent with the quantitative findings, where the item-level scores achieved for monitoring body condition, changes in how they felt, fatigue and body symptoms were all scored above 4 of a maximum score of 5, which indicates a high frequency of monitoring body symptoms. However, only 11.6% of the participants reported being able to very quickly recognise heart/stroke-related symptoms such as chest pain, shortness of breath and chest pressure. In terms of monitoring body signs, low adherence was noted in relation to frequent checking of blood pressure, which was identified in both sets of data. Many participants reported in their interviews that they tracked their weight changes over time but did not necessarily check their weight very frequently, which was echoed in the quantitative results. Moreover, many participants reported in their interviews that they were vigilant in monitoring medication effectiveness and side effects by using their somatic awareness, medication knowledge and personal experience. However, this was not congruent with survey findings, where only 36.6% of participants reported always monitoring their medications for side effects.

The interviews provided an explanation: some participants only checked their blood pressure when they felt unwell, or they reported the unavailability of blood pressure measurement devices. Multiple national and international hypertension guidelines (McEvoy et al., 2024; Schneider et al., 2020; Schutte et al., 2024; Shimbo et al., 2020) have highlighted the importance of self-measured blood pressure monitoring at home in controlling blood pressure. Hence, whatever the reason, this indicates that further self-measured blood pressure monitoring health education is needed to raise patients' awareness and knowledge of the rationale and importance of regular self-monitoring of their blood pressure at home in addition to the importance of having the equipment and skills to self-check blood pressure accurately. For future research, it will be important to conduct qualitative work to explore patients' knowledge and experiences in self-measuring blood pressure at home, examining their possession of necessary skills such as calibrating blood pressure monitoring devices and identifying any needs or barriers in relation to the self-measurement of blood pressure at home in this population.

8.2.3 Theme: Self-care management

Overall, both qualitative and quantitative findings indicated that CVD self-care management, particularly in response to acute CVD symptoms (of angina, heart attack or stroke), was inadequate among these participants. Both types of data revealed that nearly half the Chinese participants were most likely to rest and/or take self-medication in response to acute CVD symptoms. Specifically, some of the participants took TCM (the Suxiao jiuxin Pill) to mitigate heart symptoms. Quantitative findings revealed that aspirin was rarely used in the presence of heart symptoms. Another likely action for managing CVD acute symptoms or events was accessing healthcare services for guidance, although the quantitative data reported that only 57.1% of participants took this option, and the number was even lower—fewer than half of the participants—in the qualitative findings. In both sets of data, only a small proportion of the Chinese participants would have told their doctor about these cardiac symptoms at the next follow-up appointment. Moreover, in the interview data, Chinese participants who were newly diagnosed or had mild symptoms tended to opt for tolerating the symptoms without taking any action. Further, it was clear in the qualitative findings that while some Chinese participants actively consulted their doctors in response to changes in bodily signs and medication effectiveness, others tended to self-adjust their medications without professional instruction.

Suboptimal self-care management in CVD patients has been reported consistently; patients in Iceland had a mean self-care management score of 53.5 (Ingadóttir et al., 2024), patients in China had a mean score of 35.98 (Cao et al., 2019) and patients in Italy had a mean score of 65.34 (Di Matteo et al., 2024). A large study (Wechkunankul et al., 2022) indicated that five ethnic groups, including people from North-East Asia, had significantly longer decision-making times in seeking care for chest pain than the Australian-born population, and overseas-born immigrants in Australia were 60% less likely to seek medical services for managing chest pain within one hour. Similarly, this study of Chinese Australian immigrants showed inadequate self-care management, with a mean score of 54.9. Many of these study participants had not been admitted to hospital for treatment for their CVD conditions, so they may have lacked access to CVD-related health education from hospitals. This was echoed in the qualitative findings, where participants strongly requested knowledge of first aid measures for managing cardiac events or heart attacks. Although the National Heart Foundation of Australia released a heart attack information brochure in Mandarin, for many Chinese Australian patients, it is difficult to navigate and access these resources due to language barriers and a lack of technical skills (National Heart Foundation of Australia, 2023). Thus, it is crucial to not only develop patient

education that provides clear education in self-care skills in response to acute cardiac or stroke episodes, but also consider how patients may access such resources, for example, engaging with community centres and cardiac outpatient clinics to explore ways to make information available, including offering printed heart attack brochures in Mandarin.

8.3 Research question 2: Factors impacting CVD self-care behaviours

What factors impact the CVD self-care behaviours of Chinese Australians?

The main qualitative and quantitative findings regarding factors impacting CVD self-care behaviours among first-generation Chinese immigrants in Australia are listed together in Table 8-2.

8.3.1 Disease-related health literacy

Health literacy is defined by the World Health Organization (2024b, para.4) as:

Representing the personal knowledge and competencies that accumulate through daily activities, social interactions and across generations. Personal knowledge and competencies are mediated by the organizational structures and availability of resources that enable people to access, understand, appraise, and use information and services in ways that promote and maintain good health and well-being for themselves and those around them.

This research examined the impact of two domains of CVD-related health literacy on CVD self-care behaviours: CVD-related health knowledge, and seeking and sourcing CVD health information.

Table 8-2 Two dataset findings in relation to factors impacting CVD self-care behaviours

Research question: What factors impact CVD self-care behaviours of Chinese Australians?	
Phase 1 qualitative main findings	Phase 2 quantitative main findings
Self-care maintenance	
<i>Adapting to heart-healthy diets</i>	
<u>Facilitators:</u>	
<ul style="list-style-type: none"> • High health knowledge • Illness perspective: perceived need to change following disease diagnosis • Employment status: shifted focus to promoting health in retirement • Dietary acculturation: the food environment of Australia (local vegetables) • Healthy diet habits 	<ul style="list-style-type: none"> • Participants in employment had significantly lower self-care maintenance compared to those who were retired or unemployed.
<u>Barriers:</u>	
<ul style="list-style-type: none"> • Cultural factors (collectivism, prioritising families' dietary needs over own needs) • Low health knowledge: lack of specific or individualised diet-related health education • Personal habits: challenging to change • Cultural beliefs: diets preserve the joy in life 	<ul style="list-style-type: none"> • Older people had significantly higher self-care maintenance scores.* • Participants recruited from cardiac centres had significantly higher self-care maintenance scores compared to those recruited from community centres.* • Participants who felt confident in their CVD-related health knowledge had higher self-care maintenance scores than those lacking in such confidence.* • Participants searching for Western CVD health information were likely to have higher self-care maintenance scores than those only searching for Chinese health information.*
<i>Regular exercise</i>	
<u>Facilitators:</u>	
<ul style="list-style-type: none"> • Employment status: having time following retirement • Social connection: joining Chinese community group activities • High health knowledge 	
<u>Barriers:</u>	
<ul style="list-style-type: none"> • Comorbidities: arthritis and angina pain • Neighbourhood environment: living far from an exercise group 	

Research question: What factors impact CVD self-care behaviours of Chinese Australians?

Phase 1 qualitative main findings

Phase 2 quantitative main findings

- Gender role: no time as a caregiver

Adhering to prescribed medications

Facilitators:

- Personal habit: well-established medication routines
- Cultural factor: respect for professional authority
- Therapeutic relationship: patient empowerment and shared decision-making
- Illness perspective: the perceived need to take medications

Barriers:

- Poor health knowledge: self-appraisal of symptoms and self-adjusting medications
- Medication side effects
- Place of diagnosis: inconsistent opinions between physicians
- Traditional Chinese Medicine: perceived fewer side effects and better Effectiveness

Managing stress

Facilitators:

- Cultural philosophies
- Personal values and habits: self-distraction (reading, watching TV or gardening)
- Social support: family, ethnic groups

Barriers:

- Poor health knowledge
- Cultural norms: emotionally reserved

Research question: What factors impact CVD self-care behaviours of Chinese Australians?

Phase 1 qualitative main findings	Phase 2 quantitative main findings
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Attending medical follow-up appointments

Facilitators:

- Therapeutic relationship: patient empowerment and shared decision-making

Barriers:

- Inconsistent treatment plans
- Poor therapeutic rapport
- Poor health knowledge: self-appraised symptoms thought to not require follow-up

Seeking heart health information

Facilitators:

- Seeking information from social network

Barriers:

- Language barrier
- Lack of health information from mainstream health services
- No individualised health education provided

Sleeping well

Barriers:

- Comorbidities: joint pain, depression and sleep apnoea
- Addiction to digital devices

Limiting drinking

Facilitators:

- Health knowledge
- Illness perspective: the need to manage their heart disease

Research question: What factors impact CVD self-care behaviours of Chinese Australians?	
Phase 1 qualitative main findings	Phase 2 quantitative main findings
<i>Quitting smoking</i>	
<u>Barriers</u>	
• Personal habit: challenge to change overnight	
<i>Getting vaccinated:</i>	
<u>Facilitators:</u>	
• Heart health knowledge	
<u>Barriers:</u>	
• Poor health knowledge	
<i>Avoiding triggers of heart symptoms</i>	
<u>Facilitators:</u>	
• Health knowledge	
• Illness experiences	
Self-care monitoring	
<i>Monitoring bodily symptoms</i>	
<u>Facilitators:</u>	
• Health knowledge	
• Illness experiences	
• Participants recruited from cardiac centres had significantly higher self-care monitoring scores than those recruited from community centres.*	
<i>Checking body signs</i>	
<u>Facilitators:</u>	
• Availability of monitoring devices	
<u>Barriers:</u>	
• Health knowledge	
• Unavailability of monitoring devices	
• Participants who searched for Western CVD health resources were likely to have higher self-care monitoring scores than those who only searched for Chinese resources.	
• Good English proficiency was significantly related to lower self-care monitoring	

Research question: What factors impact CVD self-care behaviours of Chinese Australians?

Phase 1 qualitative main findings	Phase 2 quantitative main findings
	scores compared to the scores of those who did not speak English at all.*
<i>Monitoring medications</i>	
<u>Facilitators:</u>	
• Health knowledge	
• Illness experiences	
	Self-care management
<i>Managing heart symptoms</i>	
<u>Facilitators:</u>	
• Health knowledge	• Participants' confidence in their CVD-related health knowledge was positively associated with self-care management behaviours.*
• Social support	• Searching for Western CVD health resources was positively associated with self-care management behaviours.*
• Therapeutic relationship: patient empowerment and shared decision-making	
<u>Barriers:</u>	
• Health knowledge	• Not having been admitted to hospital for treatment was significantly associated with lower self-care management scores.*
• Traditional Chinese Medicine	
• Place of diagnosis	
• Therapeutic relationships	• Not using cardiac Traditional Chinese Medicine was significantly associated with lower self-care management scores.*
<i>Bodily signs management</i>	
<u>Facilitators:</u>	
• Heart health knowledge	
<i>Medication management</i>	
<u>Facilitators:</u>	
• Heart health knowledge	

Note: *In multivariable modelling adjusting for confounders.

8.3.1.1 CVD-related health knowledge

The qualitative data revealed that CVD-related health knowledge played an important role in influencing participants' engagement in CVD self-care across self-care maintenance, monitoring and management. Specifically, adequate CVD health knowledge motivated participants to adopt healthy diets, keep exercising, adhere to prescribed medications, manage stress, attend medical follow-up appointments, limit drinking, be vaccinated and avoid situations that could trigger heart symptoms. Participants with adequate heart and stroke health knowledge were thereby enabled to be vigilant about monitoring and correctly interpreting their changed symptoms and medication side effects. Moreover, participants with good heart health knowledge responded to acute heart symptoms by resting, taking cardiac medications and seeking health services. The quantitative findings were complementary and showed that confidence in heart and stroke health knowledge was significantly positively associated with CVD self-care maintenance, monitoring and management.

This study relied on participants' self-report of their level of CVD-related knowledge, and health knowledge was not specifically measured in this study. These self-reports were consistent with other studies that demonstrated that better heart health knowledge was related to better self-care behaviours among both coronary heart disease (Ingadóttir et al., 2024) and heart failure (Seid et al., 2019) patients. This is understandable because knowledge is recognised as a prerequisite for sound decision-making (Heil et al., 2022); in this stance, heart knowledge is a prerequisite for making evidence-based decisions and performing self-care practices. However, only 28.5% of sampled participants felt confident in their heart knowledge, which indicates that many of the Chinese participants thought they had inadequate CVD knowledge, particularly of first aid for managing heart attacks. This was also observed in a previous qualitative study that specifically demonstrated poor health knowledge of the CVD risk factors and acute coronary syndrome symptoms among Chinese immigrants in Australia, which resulted in treatment delays (Jin et al., 2020). Another Australian study revealed that CVD secondary prevention knowledge among Chinese immigrants who had survived a heart attack was insufficient, with an average score 13.1 of the maximum 20 (Shi et al., 2024).

8.3.1.2 Seeking and sourcing CVD health information

The quantitative findings further showed that those who searched for Western CVD-related health information were likely to have higher CVD self-care maintenance, monitoring and

management scores than those who only searched for Chinese health information. However, in both sets of data, many participants reported lacking access to CVD-related health information from mainstream health services. Further, participants who were hospitalised for cardiac or stroke treatment had significantly higher self-care management compared to those who did not receive hospital treatment. This could be partially explained by the qualitative finding that participants who did not receive hospital treatment reported a lack of systematic and specific heart health education, which was attributed to the limited consultation time with general practitioners or cardiac specialists. Their limited learning opportunities may have been responsible for their poorer health literacy, which subsequently impaired their capacity to perform CVD self-care management. By contrast, those who had been hospitalised for a cardiac problem would have had more opportunities to receive heart health education from hospital clinicians and be referred to cardiac rehabilitation.

These findings highlight that the channels of disease-related health information can impact participants' self-care practices. Only 25.9% of sampled participants searched for Western health information. This was consistent with another study where Chinese immigrants reported difficulty engaging with mainstream health information and resources due to language and cultural barriers (Jin et al., 2020). Notably, many participants tended to search for CVD health information from Chinese websites. However, much of this Chinese health information was not based on or verified in line with Australian clinical guidelines, which resulted in confusion and misunderstanding between patients and their doctors and further undermined Chinese immigrants' self-care behaviours. Thus, the inadequacy of CVD health literacy and poor access to verified CVD health information from mainstream resources in Australia were major barriers impeding Chinese immigrants from effectively performing evidence-based CVD self-care behaviours, particularly for those living with chronic coronary heart disease who had not been hospitalised for their CVD conditions. The development of culturally and linguistically appropriate CVD health information and programs on self-care skills targeting Chinese immigrants is warranted.

8.3.2 Personal habits, illness perspectives and experiences

From participants' narratives in the phase one study, it was apparent that personal habits influenced their ongoing CVD self-care maintenance. This included habits such as the attachment to longstanding unhealthy dietary habits and smoking and the difficulties of quitting.

The participants encountered challenges in establishing new habits, for example, creating and maintaining medication routines and managing stress. Participants' illness perspectives, including their perceptions of the changes recommended for managing their CVD disease, served as motivators to adopt a heart-healthy diet, adhere to prescribed medications, quit smoking and cut down on alcohol consumption. Moreover, the qualitative findings added that participants' illness experiences could be learning opportunities to facilitate quickly and accurately detecting a bodily change, interpreting its meaning and associating it with their CVD conditions or medication side effects.

These findings are evident in previous research (Riegel et al., 2012, 2021), which shows that personal habits and illness perspectives and experiences can influence CVD self-care practices. Thus, in addition to current routine enquiries about patients' alcohol, smoking and drug use, it would be beneficial for clinicians to take the time to explore other personal habits of Chinese patients in taking care of their CVD conditions, such as their dietary and exercise habits, how they perceive their CVD diagnosis and what they have learned from prior illness experiences. This will help clinicians to discern whether their patient's knowledge is correct to identify whether their patient may be at risk of poor engagement with self-care behaviours and perform incorrect self-care practices. As the allocation of more time to each consultation with immigrant patients may not be possible for healthcare practitioners, future work should focus on identifying clinically feasible ways to assess and triage patients in relation to their heart health information needs so that they have access to culturally appropriate health education targeted to their needs.

8.3.3 Social support

The qualitative findings indicated that social support from family and Chinese social networks enabled participants to engage in CVD self-care maintenance. In addition to family and other informal support networks, social support strategies included joining community groups for exercises, receiving emotional support for stress management and obtaining health information. Social support also helped participants to manage their acute heart symptoms, for example, when family members took them to hospital emergency departments to manage angina attacks.

Systematic reviews have shown that social support is positively associated with self-care behaviours among patients with coronary heart disease and heart failure (Babygeetha & Devineni, 2024; Graven & Grant, 2014). Thus, assessing a patient's level of social support can

assist clinicians to identify Chinese immigrants who may be at high risk of poor performance of CVD self-care; this will enable prompt referral to the appropriate social services to support patients engaging in CVD self-care.

8.3.4 Cultural factors

For the Chinese immigrants in this study, culture played an important role in their CVD self-care practices, particularly in self-care maintenance and management. Detailed in the qualitative findings, dietary acculturation and endorsed collectivism influenced participants' adherence to heart-healthy diets. Some Chinese traditional philosophies (such as staying in the present and letting go of bothersome issues) were used by participants to manage their stress levels. However, the use of TCM could hamper adherence to prescribed cardiac medications. The quantitative findings demonstrated that participants who used cardiac TCM had better self-care management compared to those not using it. This phenomenon was explained by the qualitative findings detailing that a common strategy for some participants to mitigate acute heart symptoms was to take the Suxiao jiuxin Pill, which they perceived as effective relief from their symptoms, sometimes more effective than conventional medications.

A growing body of evidence indicates that culture is a key influence in the performance of self-care behaviours among immigrant populations with CVD (Dafoe & Wong, 2018; Jin et al., 2020; Osokpo & Riegel, 2021; Riegel et al., 2012, 2021). In this study, culture served as a double-edged sword with both positive and negative influences on CVD self-care behaviours, predominantly in self-care maintenance and management. The impact of culture on CVD self-care is comprehensively discussed in Section 8.5.

8.3.5 Therapeutic relationships

The qualitative findings revealed that the therapeutic relationships between the Chinese participants and their physicians either facilitated or deterred the participants from engaging in CVD self-care behaviours.

Compared to healthcare providers in China, some participants reported higher satisfaction with their interactions with healthcare providers in Australia and highly praised their professional ethics, patient empowerment and shared decision-making. This enabled these participants to

take the initiative in managing their heart disease, such as prioritising adherence to prescribed medication regimes, attending regular follow-up appointments and responding to acute cardiac symptoms.

Some participants were not convinced to take prescribed medications, particularly where the prescribers were felt to have failed to provide adequate or consistent information. Some participants confessed that they sometimes delayed accessing medical services to manage angina because of what they perceived as their physicians' dismissive attitudes.

This was congruent with existing literature that indicates that cardiac medication adherence among Chinese immigrants is related to the quality of the consultations with physicians about the management of medication side effects (King-Shier et al., 2017). Barriers to CVD self-care behaviours can arise from confusion or inconsistent information from different healthcare providers. Thus, it is important for clinicians to empower Chinese immigrants to be involved in their treatment plans by encouraging them to express any concerns or confusion regarding the treatment plans.

8.3.6 Employment status and age

The quantitative findings identified that participants who were retired or unemployed had better self-care maintenance compared to those in employment. The qualitative findings provided rich details to contextualise that, following retirement, participants reported spending more time investing in their health maintenance and promotion, such as adopting healthy diets and developing exercise routines. The quantitative findings complemented this by showing that being older was linked to better self-care maintenance.

This was also observed in previous studies of coronary heart disease patients (Di Matteo et al., 2024; Manal Al-Sutari, 2022; Maruta et al., 2021). This may be attributed to increased disease knowledge, experience and skills accumulated over years, which provides older patients with a greater capacity to manage their CVD condition. Moreover, compared to younger patients with ongoing work and family commitments, older patients reported having more time for CVD self-care. Thus, assessing and recognising these sociodemographic factors can help clinicians identify patients who may be at high risk of poorer performance of CVD self-care practices.

8.3.7 Comorbidity

As reported by some participants, comorbidity can complicate CVD self-care maintenance. For example, pain caused by arthritis was a deterrent to regular exercise and engagement in social activities. Some participants living with comorbidities were concerned about taking multiple medications, which could threaten their cardiac medication adherence.

Comorbidity has been recognised as one of the major challenges for performing CVD self-care behaviours; the prevalence of multimorbidity is observed to be rising alongside the progressively aging population (Riegel et al., 2021; Riegel & Jaarsma, 2021). Hence, clinical assessment must take these factors into account to address current and future barriers for Chinese immigrants' performance of CVD self-care behaviours by providing appropriate and feasible strategies to manage the challenges of comorbidity.

8.3.8 Other factors

The qualitative findings also indicated that the built environment can impact exercise routines. One participant limited her exercise because there was no local outdoor location for physical activities. The lack of monitoring devices at home was another barrier to participants checking their body signs. Moreover, CVD self-care could be impacted by where the CVD was diagnosed, as the inconsistencies between treatment plans of different healthcare systems confused participants and further undermined their treatment engagement. However, this contradicted the quantitative findings, where no significant association between the place of diagnosis and CVD self-care was found. However, the quantitative study findings did show that participants recruited at a cardiac centre had significantly better self-care scores than those recruited from community settings.

8.4 Research question 3: The acculturation experiences

What are their acculturation experiences in terms of cultural practices, cultural values and beliefs and cultural identification?

The main qualitative and quantitative findings regarding cultural practices, cultural values and beliefs, and cultural identification among first-generation Chinese immigrants in Australia are listed together in Table 8-3.

Overall, these Chinese immigrant participants predominantly preserved their Chinese culture with a low level of acculturation to the Australian milieu, which was confirmed in both the phase one qualitative and phase two quantitative findings. Specifically, the acculturation experiences of these participants were individualised and multifaceted, and cultural interactions permeated every domain of acculturation to various degrees. Thus, the synthesised qualitative and quantitative findings on acculturation experiences were grouped into themes of proxy acculturation measures, cultural practices, cultural values, cultural identification, healthcare system utilisation and new living environment.

8.4.1 Theme: Proxy acculturation measures

The findings in relation to proxy acculturation measures were consistent across qualitative and quantitative findings. These Chinese participants migrated to Australia at the mean age of around 55 years (relatively late in life) following their retirement in China. They had lived in Australia for a mean of around 15 years, yet nearly half reported poor or no English language proficiency.

8.4.2 Theme: Cultural practices

The qualitative and quantitative data concurred that Chinese participants mainly retained Chinese cultural practices, but some had integrated into Australian culture to differing degrees in various domains of cultural practices, mainly related to dietary practice, social networks, language use and media preference.

Table 8-3 Two dataset findings in relation to the acculturation experiences of Chinese immigrants

Research question: What are their acculturation experiences in terms of cultural practices, cultural values and beliefs and cultural identification?	
Phase one: Qualitative main findings	Phase two: Quantitative main findings
Theme: Proxy acculturation measures	
<i>Age at migration</i>	<i>Age at migration</i>
<ul style="list-style-type: none"> Most had migrated to Australia at a relatively older age (mean 55 years). 	<ul style="list-style-type: none"> The mean age of the sample at migration was 55.1 years.
<i>Residence duration</i>	<i>Resident duration</i>
<ul style="list-style-type: none"> Participants had lived in Australia for a mean 14.4 years. 	<ul style="list-style-type: none"> Participants had been residents in Australia for an average 16.7 years.
<i>English proficiency</i>	<i>English proficiency</i>
<ul style="list-style-type: none"> 45% participants reported poor English proficiency. 	<ul style="list-style-type: none"> 41.2% of participants could not speak English.
Theme: Cultural practices	
<i>Dietary practices</i>	<i>Suinn-Lew Asian Self-Identity Acculturation (SL-ASIA)</i>
<u>Retaining cultural dietary habits</u>	<ul style="list-style-type: none"> The mean score for the original 21-item SL-ASIA scale was 1.8 (of maximum 5), which indicates a low acculturation level in language use, ethnic identity, cultural behaviours and ethnic interactions.
<ul style="list-style-type: none"> All were accustomed to Chinese foods, retained Chinese taste preferences, food ingredients, cooking style and social meals. 	
<u>Integrating into Australian dietary culture</u>	<i>SL-ASIA behavioural competency</i>
<ul style="list-style-type: none"> Most adapted to a Western-style breakfast. Some adapted to local ingredients (vegetables), local cooking style and local foods. 	<ul style="list-style-type: none"> More participants tended to score as "Chinese" (78.3%) compared to "bicultural" (19.2%) in terms of fit in cultural groups.
<i>Social networks</i>	<i>Bicultural Efficacy in Health Management (BEFF-HM)</i>
<u>Retaining Chinese network</u>	<ul style="list-style-type: none"> Except for one item dealing with a new language (mean score 1.83), participants reported high self-efficacy in dealing with unfamiliar Australian foods (3.60 of 4) and new lifestyle in Australia (3.65 of 4).
<ul style="list-style-type: none"> Some actively maintained overseas social networks. Many establishing new networks, e.g., moving to ethnic enclave neighbourhoods, joining Chinese community centres. 	

Research question: What are their acculturation experiences in terms of cultural practices, cultural values and beliefs and cultural identification?

Phase one: Qualitative main findings

Phase two: Quantitative main findings

Integrating Australian network

- Few made native friends.

Language use

Using the Chinese language

- Most sought Chinese-speaking physicians.
- Many searched for heart health information in Chinese.

Dealing with a new language

- Some used family interpreters or service interpreters in healthcare settings.
- Few used translator devices.

Media preferences

Chinese media

- Many searched for heart health information via Chinese media.

Australian media

- Few searched for heart health information via mainstream media (websites).

Festival celebration

- Few celebrated Chinese festivals: drinking alcohol.
- Few celebrated Australian festivals.

Theme: Cultural values

Traditional values

Retaining Chinese values

- Most retained traditional philosophies: Buddhist (living in the present), Taoist (keeping a peaceful mind) and Confucianist (tolerating pain, being emotionally reserved).

SL-ASIA cultural values

- Two-thirds of participants self-identified as maintaining "Chinese" values regarding family relationships and traditional values; one-third identified with bicultural values.

Research question: What are their acculturation experiences in terms of cultural practices, cultural values and beliefs and cultural identification?

Phase one: Qualitative main findings	Phase two: Quantitative main findings
<u>Integrating with Australian values</u> <ul style="list-style-type: none">• Some adaptation to individualism: prioritise own needs, simplify social norms,• Some learned to slow the pace of lives.	<i>BEFF-HM</i> <ul style="list-style-type: none">• Participants reported high self-efficacy in maintaining family relations in Australia with a score 10.65 of 12.
<i>Family relationships</i>	
<u>Retaining traditional family ties</u> <ul style="list-style-type: none">• Most retained traditional values: filial piety expectations, family collectivism, gender roles.	
<u>Integrating into individualism</u> <ul style="list-style-type: none">• Some adjusted to individualism: lived independently.	
Theme: Cultural identification	
<i>Cultural belongings</i>	
<u>Retaining Chinese identification</u> <ul style="list-style-type: none">• Nearly half reported a lack of belongingness to Australia.• Some adapted to settlement in Australia.	<i>SL-ASIA cultural identity</i> <ul style="list-style-type: none">• 70.6% of participants self-identified as "Chinese".
<u>Integrating to Australian identification</u> <ul style="list-style-type: none">• Small numbers felt a sense of belonging to Australia.	
Theme: Healthcare system utilisation	
<i>Navigating medical services</i>	
<u>Adapting to the new healthcare system</u> <ul style="list-style-type: none">• Many adapted to the new healthcare system: actively accessed medical services.• Some praised Australian health services: patient-centred care, triage system and cultural care.	<i>BEFF-HM</i> <ul style="list-style-type: none">• Participants reported a high score of 33.6 of 40, which indicates they perceived high self-efficacy in coping with acculturation stressors relating to health management.• Participants reported high self-efficacy in utilising healthcare systems in Australia, with the score 13.83 of 16, in booking a medical appointment, receiving the needed healthcare, communicating with doctors and understanding medical instructions.
<u>Difficulties with a new healthcare system</u> <ul style="list-style-type: none">• Some reported unfamiliarity with the healthcare system.• Some complained about referral systems: a barrier to healthcare access.	

Research question: What are their acculturation experiences in terms of cultural practices, cultural values and beliefs and cultural identification?

Phase one: Qualitative main findings	Phase two: Quantitative main findings
<i>Patient and doctor interactions</i> <ul style="list-style-type: none">• Many reported positive experiences: the authority and prestige of healthcare providers in Chinese culture, patient empowerment and shared decision-making in Australia.• Some reported negative experiences: dismissive attitudes, poor communication, loss of trust.	<i>Beliefs in Traditional Chinese Medicine (TCM beliefs)</i> <ul style="list-style-type: none">• Participants' held attitudes scored as neutral and slightly agreeing with TCM beliefs, with a mean score of 3.4.• Around one-third of participants (31.5%) used TCM to manage their CVD.
<i>Financial issues including health insurance</i> <ul style="list-style-type: none">• Half praised the national Medicare system: general care, cardiac care.• Some reported financial stresses: accessing ambulance services, self-funding health services.	
<i>Traditional Chinese Medicine (TCM)</i> <ul style="list-style-type: none">• Half endorsed the effectiveness of TCM.• A few believed in Western medicine beliefs.• Many used TCM for health and illness: food therapy, acupuncture, herbal medicine, Tai Chi.	
Theme: New living environment	
Some praised the good air quality, weather temperature and food safety in Australia.	

8.4.2.1 Dietary practice

All participants predominantly maintained Chinese taste preferences, cooking ingredients, cooking style and the habit of having social meals. Simultaneously, many gradually transitioned to a Western-style breakfast, and some participants learned to cook local food ingredients and tasted local cuisines, which they attributed to local availability, affordable prices and food safety in Australia. These findings were consistently shown in the original 21-item SL-ASIA scale, which indicated that the Chinese participants maintained a low level of acculturation, including the domain of cultural dietary behaviours. In the BEFF-HM scale, many participants reported high capability in dealing with unfamiliar Australian foods.

Although most Chinese participants retained traditional dietary habits, the integration of some Western-style cooking and food ingredients was ubiquitous. This aligns with findings from prior studies describing the dietary acculturation of Chinese immigrants in the United States of America, Canada and Australia (Lee et al., 2022; Zou et al., 2022). Thus, to avoid cultural stereotypes, it is important for clinicians to acknowledge the changes in post-migration dietary practices among Chinese immigrants and offer acceptable and feasible dietary recommendations that are consistent with the dietary preferences of Chinese immigrants.

8.4.2.2 Social networks

Many participants retained their overseas Chinese social networks. New Chinese social connections were established in Australia by moving to ethnic enclave neighbourhoods and joining Chinese community associations. Some also made native friends or were on familiar terms with the locals in their neighbourhood. These findings were reflected in the original 21-item SL-ASIA scale, which indicated that Chinese participants maintained a low level of acculturation, including the domain of ethnic interactions. The SL-ASIA behavioural competency scale showed that many participants scored themselves as “Chinese” (78.3%) compared to “bicultural” (19.2%) in terms of fit with social networks.

In line with previous studies, the sampled participants lived in or in close proximity to ethnic communities (Chun et al., 2011; Xiao et al., 2023). The findings shed light on the importance of Chinese community associations in providing social support for older Chinese immigrants, particularly for those living away from adult children, to manage acculturation-related stress and adapt to settlement in Australia. This was echoed in studies conducted in the US (Chun et al.,

2011; Kim & Silverstein, 2021). Moreover, Chinese community associations build bridges between older Chinese immigrants and mainstream society, predominantly in accessing public health information and social resources, which was emphasised in a study conducted during the COVID-19 pandemic (Xiao et al., 2023). All these points indicate that collaborating with Chinese community associations could be a feasible approach to reach older Chinese immigrants to deliver public health-related programs and interventions.

8.4.2.3 Language use and media preferences

All participants preferred speaking Chinese, but some had learned at least some English or used interpreters or interpretation devices, particularly for accessing healthcare services. Participants who attended the Adult Migrant English Program (a free service in Australia to help immigrants improve English and settlement in Australia, <https://immi.homeaffairs.gov.au/settling-in-australia/amep/about-the-program>) found it challenging to learn a new language. They reported lacking any opportunity to practice their new English learning after the classes. The level of English taught, while sufficient for routine daily needs, was insufficient for them to understand and effectively communicate with their doctors. Most participants preferred Chinese media, such as social media tools, websites, TV channels and news reports, especially for searching for information such as CVD health resources. A few participants with good English proficiency browsed Australian media. These findings were consistently shown in the original 21-item SL-ASIA scale, which indicated that Chinese participants maintained a low level of overall acculturation, including the domain of language use and preference.

Language was a major challenge reported by the sampled Chinese immigrants settled in Australia, which paralleled that of other foreign-born older Chinese immigrants living in the US, Canada and other Western countries (Hu et al., 2022; Lee et al., 2021; Modesti et al., 2021). Similar to previous studies (Chao et al., 2020; Jin et al., 2020; Zhang et al., 2018), participants in this study highlighted that language barriers undermined their autonomy and self-efficacy in accessing health services for managing their health, which resulted in their underutilisation, particularly of acute or specialist care services. Moreover, language barriers prevented these participants from seeking evidence-based health information and resources from mainstream society. Given the rising prevalence of chronic diseases and poor health literacy reported among Chinese immigrant populations (Cai et al., 2024; Lin et al., 2024; Zhang et al., 2020), there is a pressing need to develop strategies to increase their access to healthcare services and standard

public health messages. With the advances in the field of digital health, prospects are promising for leveraging artificial intelligence (AI) to address the language barrier faced by older Chinese immigrants. For the future, AI may assist clinicians in identifying and prioritising patients with language barriers and those most in need of interpreter services, and it could improve the allocation of interpreter resources in clinical settings, the workflow of clinical practices and access to healthcare services among the immigrant population (Barwise et al., 2024). In addition, when developing an app or website for messaging public health information such as evidence-based healthy lifestyles, adding multi-language features might be a viable means to reach out to culturally and language-diverse populations.

8.4.3 Theme: Cultural values

Consistent across both qualitative and quantitative findings, these Chinese participants predominantly retained Chinese cultural values, although, to various degrees, some integrated into Australian cultural life values and family relationships.

8.4.3.1 *Traditional values*

The qualitative findings articulated the nature of the participants' acculturation transition in terms of traditional values. While participants reported maintaining unchanged Chinese religious or philosophical principles derived from, for example, Buddhism, Confucianism and Taoist thought, some had unconsciously learned to slow the pace of their lives and simplify their lives in Australia. This pattern was confirmed in the SL-ASIA cultural values scores, which showed that nearly two-thirds of participants self-identified as maintaining "Chinese" values, whereas one-third identified as having both Chinese and Australian values.

These findings were similar to those of another study that demonstrated that 78.7% of Chinese Australians endorsed the importance of preserving Chinese traditions (Eh et al., 2016). Cultural values can impact individuals' health beliefs and illness perspectives and shape their behaviours in maintaining health and managing disease (Osokpo & Riegel, 2021; Riegel et al., 2012). Typically, in this project, the reserved emotional habitus rooted in Chinese cultural values, especially bearing hardship, discouraged older Chinese participants from seeking professional health services to manage their acculturation-related psychosocial issues, which resulted in the low utilisation of mental health services. In another study (Katigbak et al., 2019), Chinese cultural values, described as cultivating strong willpower and endorsing behavioural self-control, were

identified as major barriers for Chinese immigrants to access smoking cessation services. That is, the failure to quit smoking on one's own was stigmatised as a character weakness, which deterred the immigrant participants from seeking access to support services. Thus, being sensitive to Chinese cultural values could help clinicians identify Chinese immigrants at high risk of underutilisation of healthcare services and support the provision of culturally sensitive practices.

8.4.3.2 Family relationships

Most participants retained traditional family values, particularly in relation to expectations of filial piety from their adult children, gender roles and family-centred collectivism, which prioritises the needs of the family over those of the individual. However, some were slowly adjusting to Australian individualistic cultural values and had learned to live independently from their adult children. This was confirmed in the SL-ASIA cultural values scores. Further, the BEFF-HM scale scores provided complementary findings by showing that participants perceived they had the capacity to maintain good family relationships following migration.

A body of evidence indicates that filial piety was significantly associated with older Chinese immigrants' mental health, including anxiety, loneliness and depression (Cheung et al., 2022; Kim & Silverstein, 2021; Zhang, 2022). This was echoed in this study, where discrepancies in filial piety expectations between Chinese participants and their adult children could generate family conflicts and expose them to mental distress and social isolation. Therefore, for clinicians, it is important to assess the family dynamics of older Chinese immigrants to identify and support those in the population who may lack social support and be at high risk of hidden mental issues. Further to the findings, many participants valued family-centred collectivism in that they prioritised family over individual needs, such as preparing family meals and making disease-related decisions. Involving the families of Chinese immigrants' treatment plans may be a viable strategy to improve treatment engagement among Chinese immigrant populations.

8.4.4 Theme: Cultural identification

From the qualitative findings, nearly half the participants reported that they lacked a sense of belongingness in Australia with no change in their cultural identification; others were still in a state of transition and were adapting to their settlement in Australia. This was a similar picture

to that of the quantitative findings, where 70.6% of participants identified themselves as “Chinese”.

8.4.5 Theme: Healthcare system utilisation

8.4.5.1 *Navigating medical services*

The qualitative findings showed that many Chinese participants were well-adapted to their new healthcare system in Australia, which manifested in actively accessing primary care services, familiarising themselves with how the Australian Medicare system worked, including referrals and triaging care needs, and praising shared decision-making and culturally appropriate care from healthcare providers. This was congruent with the quantitative findings that demonstrated many participants felt sure or very sure about utilising the healthcare system. The qualitative findings also complemented these findings by revealing that only a small group of Chinese participants had difficulties in adapting to the new healthcare system, which they attributed to unfamiliar and complicated referral systems, experiences of poor therapeutic relationships, inconsistent treatment plans and some expensive services where they were required to pay costs individually.

Chinese participants in this study actively accessed primary care services for managing their health issues, which is discordant with other studies that indicate low utilisation of primary care services among foreign-born Chinese immigrants (Badanta-Romero et al., 2021; Xiao et al., 2023). One possible explanation is that participants recruited in this study resided in neighbourhoods with a high density Chinese population, where Mandarin-speaking general practitioners were available and accessible. However, they disclosed difficulties in accessing specialist care, acute medical services and allied health care in Australia, which they attributed to language barriers and unfamiliarity with the healthcare system in Australia. As discussed earlier, language barriers can be addressed by guiding Chinese participants to book interpreter services and leverage technology such as AI-assisted translation devices, if accredited. In addition to promoting equitable access to healthcare services, collaborating with Chinese community associations or community libraries to deliver information sessions introducing the Australian healthcare system to Chinese immigrant populations might help, particularly for new arrivals.

8.4.5.2 TCM

In terms of beliefs and practices in relation to TCM, the qualitative and quantitative findings differed. The qualitative data indicated that the use of TCM (such as food therapy, acupuncture, herbal medicine and Tai Chi) was common among Chinese participants to promote general health and manage heart disease, with half believing that TCM was effective. However, the quantitative data showed that although 31.5% used TCM to manage their heart condition, overall, Chinese participants took an almost neutral position in relation to its effectiveness.

In this study, Chinese participants integrated TCM with prescribed Western medications to manage their heart-related disease, which is consistent with other studies (Eh et al., 2016; Jin et al., 2020; King-Shier et al., 2017). Further, this study revealed that Chinese immigrants may not disclose the fact that they take TCM to their healthcare providers because of the fear of being judged or blamed. Thus, clinicians should be aware of the possibility that Chinese immigrants take TCM, should ensure non-judgemental attitudes to such conversations and offer medication education on the potential contradictory effects when combining TCM and Western-prescribed medications.

8.4.6 Theme: New living environment

The qualitative findings revealed high praise from some participants for Australia's good air quality, weather, climate and food safety compared to China.

8.5 Research question 4: The impact of acculturation on CVD self-care behaviours

How do Chinese Australians' unique acculturation experiences impact their self-care practices for their CVD?

Table 8-4 Two dataset findings in relation to the impact of acculturation on CVD self-care

Research question: How do Chinese Australians' unique acculturation experiences impact their self-care practices for their CVD?	
Phase one: Qualitative findings	Phase two: Quantitative findings
Cultural practices	
<i>Dietary practices</i>	
<u>Retaining cultural dietary habits in relation to self-care maintenance</u>	<i>Original Suinn-Lew Asian Self-Identify Acculturation (SL-ASIA) scale</i>
Facilitators:	• Original SL-ASIA acculturation scale scores were not significantly associated with self-care behaviours, including self-care maintenance, monitoring and management.*
• Light eating patterns with less salt and oil	
Barriers:	
• Heavily salted and spiced dishes	<i>SL-ASIA behavioural competency scale</i>
• Meat stew (increases cholesterol)	• SL-ASIA behavioural competency scores were not significantly associated with self-care behaviours, including self-care maintenance, monitoring and management.*
• No dietary restriction as food served for the joy of living	
<u>Integrating into Australian dietary culture in relation to self-care maintenance</u>	
Facilitators:	<i>SL-ASIA values scale</i>
• Most adopted Western-style breakfasts (such as milk and cereal)	• SL-ASIA value scale scores were not significantly associated with self-care behaviours, including self-care maintenance, monitoring and management.*
• Increased consumption of vegetables, fruits, seafood, dairy products and whole grains	
• Some became accustomed to local cooking (salads), local ingredients (vegetables)	
Barriers:	
• A few adopted local dietary behaviours: 'fast food', bakery and lollies	<i>SL-ASIA self-identification scale</i>
• One participant ate more red meat	• SL-ASIA self-identification scale scores were not significantly associated with self-care behaviours, including self-care maintenance, monitoring and management.*
<i>Social networks</i>	
<u>Separating from overseas social networks in relation to self-care maintenance</u>	<i>Bicultural Efficacy in Health Management (BEFF-HM) scale</i>
Facilitators:	• Perceived self-efficacy in addressing acculturation stressors in relation to health management was positively associated with CVD self-care maintenance and monitoring.*
• Simpler social life with less social responsibility and reduced stress	
• Reduced social activities and meals made it easier to adhere to medications and healthy diets	
• Maintained overseas social networks to seek health information and emotional support	
Barriers:	

Research question: How do Chinese Australians' unique acculturation experiences impact their self-care practices for their CVD?

Phase one: Qualitative findings	Phase two: Quantitative findings
<ul style="list-style-type: none">Traditional Chinese Medicine (TCM) or health supplements recommended by overseas friends affected medication adherence. <p><u>Establishing a new Chinese network in relation to self-care maintenance</u></p> <p>Facilitators:</p> <ul style="list-style-type: none">Newly established network to manage acculturative stress and social isolationChinese community centres support regular exerciseHealth talks in the community centre for heart health knowledgePeer support motivates uptake of healthy diets <p><i>Language/media use</i></p> <p><u>Adapting to new language in relation to self-care maintenance and management</u></p> <p>Facilitators:</p> <ul style="list-style-type: none">Sought Chinese-speaking physicians for medical careUse adult children or healthcare interpreters for medical appointments <p>Barriers:</p> <ul style="list-style-type: none">Difficulty in accessing ambulance/hospital services to manage cardiac eventsPoor access to mainstream heart health information	<p><i>Traditional Chinese Medicine (TCM) beliefs scale</i></p> <ul style="list-style-type: none">Stronger belief in TCM was significantly associated with higher CVD self-care management.* <p><i>Proxy acculturation measures</i></p> <ul style="list-style-type: none">Age at migration was positively associated with CVD self-care maintenance scores.*Residence duration was negatively associated with CVD self-care management scores.*Participants with good English proficiency scored lower in CVD self-care monitoring scores than those with no English proficiency.*
Cultural values	
<p><i>Traditional values</i></p> <p><u>Retaining traditional values in relation to self-care maintenance and management</u></p> <p>Facilitators:</p> <ul style="list-style-type: none">Buddhist values enabled stress managementTaoist philosophy supported emotional stability <p>Barriers:</p> <ul style="list-style-type: none">Adhering to Confucian beliefs (enduring pain) deterred management of heart symptomsSuppression of emotion prevented seeking psychological support services	

Research question: How do Chinese Australians' unique acculturation experiences impact their self-care practices for their CVD?

Phase one: Qualitative findings

Phase two: Quantitative findings

Adjusting to Australian culture in relation to self-care maintenance and overall self-care

Facilitators:

- Adapting to individualism for emotional well-being and engagement in self-care
- Simpler social norms and fewer social responsibilities enabled adherence to medications, heart-healthy diets
- Living at a slow pace was beneficial for stress management

Family relationships

Retaining traditional family ties in relation to overall self-care and maintenance

Facilitators:

- Receiving filial piety was beneficial for emotional well-being
- Adult children involved in self-care: supervising diet, exercise, medications, making disease-related decisions in response to symptoms and helping with access to health services
- The collectivist value of not burdening the family enabled taking an active role in self-care
- Partners involved in supporting overall self-care

Barriers:

- Preparing the family food deterred adherence to heart-healthy diets
- Being a carer left no time for regular exercise
- Emotional distress due to intergenerational discrepancies in filial piety

Adjusting to Australian individualism in relation to overall self-care and maintenance

- Individualism mitigated emotional distress and motivated engagement in self-care

Cultural identification

No reported effect.

Utilising healthcare systems

Research question: How do Chinese Australians' unique acculturation experiences impact their self-care practices for their CVD?

Phase one: Qualitative findings

Phase two: Quantitative findings

Navigating medical services

Successful adaptation to the health system in relation to self-care maintenance and management

Facilitators:

- Actively seeking primary care and specialist services, attending appointments
- Positive attitude towards triaging of cardiac symptoms motivated management of acute heart conditions
- Satisfaction with care quality motivated self-care
- Culturally appropriate care: culturally relevant dietary recommendations enabled blood sugar management

Difficulties in navigating health systems in relation to self-care maintenance and management

Barriers:

- Unfamiliarity caused low health services utilisation to manage cardiovascular disease
- Self-adjustment of cardiac medications resulted from the perceived complicated referral system
- Perceptions of the referral system deterred self-management of their heart condition
- Turning to TCM practitioners impaired self-care adherence

Patient and healthcare provider interaction

Positive therapeutic relationships in relation to self-care maintenance and monitoring

Facilitators:

- Respecting doctors' authority and prestige supported adherence to medications and appointment attendance
- Empowerment and shared decision-making enabled overall self-care

Financial issues including health insurance

Facilitator:

- Access to Medicare relieved stresses around promoting heart symptom management and overall
-

Research question: How do Chinese Australians' unique acculturation experiences impact their self-care practices for their CVD?

Phase one: Qualitative findings

Phase two: Quantitative findings

self-care

Barrier:

- Expensive private services prevented uptake to manage angina

Traditional Chinese Medicine

Facilitators:

- Endorsed TCM belief that emotional and physical health are closely connected; thus, it is vital to maintain emotional well-being for heart disease recovery

- Tai Chi exercises

Barriers:

- Food therapy deterred medication adherence
- Belief in bed rest demotivated physical activity
- Herbal medications to manage heart disease compromised self-care management

Note: Adjusting for gender, education level, domiciliary status, private insurance, years of diagnosis, hospital treatment and other acculturation variables listed in the table.

The main qualitative and quantitative findings regarding the impact of acculturation on CVD self-care behaviours among first-generation Chinese immigrants in Australia are listed in Table 8-4. To synthesise the two sets of data, acculturation in relation to CVD self-care behaviours was grouped according to the acculturation scales: the SL-ASIA scale, the BEFF-HM scale, the TCM belief scale and proxy acculturation measures. Each scale assessed specific domains of acculturation experiences impacting CVD self-care.

8.5.1 The SL-ASIA scale

Findings from the qualitative data and the SL-ASIA scale scores regarding the impact of acculturation on CVD self-care were discordant in specific domains of acculturation involving cultural practices and cultural values but consistent in cultural identification.

In terms of cultural practices, the findings were complex. The qualitative findings revealed that both retaining Chinese dietary culture and integrating with Australian dietary culture both facilitated and hindered participants adopting heart-healthy diets, illustrated by, for example, participants continuing to eat culturally salted and spiced dishes but increasing their consumption of local fruits and vegetables. Retaining their previous overseas Chinese networks influenced participants' CVD self-care, particularly their self-care maintenance. For example, participants sought heart health information and emotional support from overseas social networks. However, the use of TCM and health supplements recommended by their friends in China undermined their adherence to Australian medications. Their newly established Chinese network in Australia provided a means to cope with their acculturative stress and relieve their social isolation, which facilitated their stress management. Language barriers deterred these Chinese immigrants from accessing acute care services and obtaining heart health information from mainstream sources.

In terms of cultural values, retaining Chinese traditional values and family relationships could impact CVD self-care maintenance and management by, for example, deterring adherence to medications, heart-healthy diets, physical activity, stress management and heart symptom management. Integrating Australian cultural values could benefit CVD self-care through, for example, supporting stress management, healthy diets and medication adherence.

In terms of cultural identification, no impact was reported by participants; there was no indication that cultural identification was influential to their CVD self-care behaviours.

The original 21-item SL-ASIA scale, the SL-ASIA behavioural competency scale, the SL-ASIA values scale and the SL-ASIA self-identification scale together indicated that the levels of acculturation reported in the various domains of cultural practices, values and identification were not significantly associated with CVD self-care behaviours in any of the domains of self-care maintenance, monitoring and management.

The SL-ASIA scale was not significantly associated with CVD self-care behaviours among the sampled population, which is congruent with studies conducted among Chinese Americans with diabetes (Chun et al., 2016), Filipino Americans with hypertension (Ea et al., 2018) and African Americans with chronic disease (Osokpo et al., 2022). Conversely, another study indicated that Chinese immigrants with greater acculturation to Australian culture had better adherence to their diabetic medications (Eh et al., 2016). Some of this inconsistency can be attributed to using different acculturation measures that capture different domains of acculturation experiences. It is also possible that the association between the acculturation measure and self-care was attenuated when more potent variables were added to the multivariable regression model (Ea et al., 2018). Nonetheless, in clinical practice, there is value in taking time to evaluate the acculturation experiences of Chinese immigrants, as this information can guide clinicians as they try to provide acceptable and feasible instructions to improve CVD self-care behaviours among this population.

8.5.2 The BEFF-HM scale

The qualitative findings and the quantitative BEFF-HM scale findings concurred. The quantitative findings revealed that the perceived ability to cope with acculturation stressors in terms of maintaining family relations, utilising a new healthcare system and dealing with a new language and lifestyle in Australia facilitated CVD self-care maintenance and monitoring. This was supported and detailed in the qualitative findings.

The participants who maintained good family ties expressed this through having supportive partners and adult children holding strong values of filial piety who were actively involved in the participants' overall CVD self-care, and specifically by supervising their healthy diet choices and regular exercise, obtaining medications and making disease-related decisions in response to symptoms. Further, receiving filial piety from adult children was beneficial for participants' stress management.

Participants who were well-adapted to the new healthcare system in Australia actively sought primary care and specialist services to manage their cardiac medications and heart symptoms. Their satisfaction with the quality of care and positive interactions with healthcare providers in Australia motivated their engagement in CVD self-care maintenance and monitoring, such as adhering to healthy diets and medications, attending regular medical appointments and blood pressure monitoring.

Participants who were better adapted to a new life in Australia denied the existence of language barriers in accessing primary and specialist care, as they proactively sought Chinese-speaking physicians and used a health service or family interpreter. They reported dietary acculturation in that most had adopted a Western-style breakfast (milk, cereal and bread), and some had increased their consumption of vegetables, fruits, seafood, dairy products and wholegrains following migration.

Contextualised with qualitative findings, BEFF-HM scale scores were positively associated with CVD self-care behaviours among the sampled population. This was consistent with another study using the BEFF-HM scale to investigate the relationship between acculturation and diabetes management among Chinese Americans (Chun et al., 2016). Thus, the BEFF-HM scale results may be salient for clinicians to identify immigrant patients at a high risk of poor performance of self-care practices. To implement it, healthcare providers could open the conversation with Chinese immigrants by asking about any challenges they encounter engaging with their CVD self-care, particularly in dimensions of maintaining close family ties, utilising the healthcare system and adapting to a new lifestyle in Australia.

8.5.3 TCM beliefs scale

The qualitative findings revealed a mixed effect from retaining TCM beliefs on CVD self-care behaviours. Specifically, participants reported that TCM advocated that maintaining a positive attitude was beneficial for their heart disease recovery, and they attached great importance to maintaining emotional well-being. Conversely, some participants endorsed the TCM belief that bed rest was essential for recovery from CVD, which deterred them from physical activity. Participants reported a preference for cultural food therapy for managing their CVD risk factors rather than taking medication. Moreover, over one-third took herbal medications to manage their heart disease, and one-quarter used them as first-line medications for managing angina, which hindered adherence to Western medication regimes, complicated their cardiac treatment

and delayed timely access to treatment for angina or heart attacks. Overall, this was discordant with the quantitative findings that indicated that participants retaining stronger beliefs in TCM had better CVD self-care management.

A prior study found that a strong belief in the superiority of TCM among Chinese Australians was associated with poor medication adherence in managing their diabetes (Eh et al., 2016). This contradicts the finding of the current study that Chinese immigrants holding stronger beliefs in the effectiveness of TCM had better self-care management in response to acute cardiac events or heart attacks. Different tools assessing self-care outcomes may explain this. In our study, the self-care management scale that was employed does not specify that the medication used for managing angina or cardiac events should be a prescribed Western medication. Our qualitative findings showed that some Chinese immigrants tended to use TCM, such as the Suxiao juxin Pill, as first-line medication, which is a commonly used over-the-counter or prescribed medication in China and is believed to be effective in mitigating acute coronary symptoms. However, this practice is inconsistent with CVD clinical guidelines in Australia and may complicate and mask angina symptoms. Thus, it is recommended that clinicians assess the use of TCM in this population and provide them with heart attack first aid education.

8.5.4 Proxy acculturation measures

The quantitative findings concurred that a lower level of acculturation (older age at migration, shorter residence duration and no English proficiency) was associated with better CVD self-care practices.

This was discordant with prior studies that indicate that the proxy acculturation measures of age at migration and residence duration in the host country were not significantly associated with self-care behaviours among African immigrants with chronic disease and Chinese immigrants with diabetes in the US (Chun et al., 2016; Osokpo et al., 2022). It may be partially explained by the fact that these proxy acculturation measures, using a single demographic variable, do not directly measure the acculturation domains or the cultural adaptation process (Chun et al., 2016; Zane & Mak, 2003). Thus, for future research, studies using proxy acculturation measures should be carefully interpreted.

8.6 Study strengths and limitations

This study addresses important gaps in the literature and is the first to comprehensively explore self-care behaviours among first-generation Chinese immigrants with CVD in Australia. By employing the Middle-Range Theory of Self-Care of Chronic Illness, CVD self-care—a multidimensional process—was addressed through three core components: self-care maintenance, self-care monitoring and self-care management. Instead of focusing on the unidirectional impact of Chinese culture, it provided insights into how the dynamic and complex cultural transition process between Chinese and Australian cultures, referred to as acculturation, influenced Chinese immigrants' CVD self-care.

Using a mixed method study design, the researcher used two methods of data collection and analysis to address the research questions, which provided greater breadth and depth of knowledge on how Chinese immigrants take care of their CVD in a cross-cultural context. By integrating two sets of data generated from qualitative and quantitative methods, the study offers a nuanced perspective that has the potential to inform culturally sensitive interventions and healthcare practices, which makes it a valuable addition to the field.

Rather than approaching Chinese participants with CVD in hospital settings (such as cardiac rehabilitation), as in existing literature conducted in Australia (Shi et al., 2024; Zhang et al., 2018), 280 participants (including both phases one and two) were recruited from community settings via three main sources: Chinese community associations, social media and community medical centres. This provided different insights into self-care behaviours among first-generation Chinese immigrants with CVD in community settings. This study also confirmed that the recruitment setting and the receipt of hospital CVD treatment were significant factors impacting CVD self-care behaviours.

The survey instruments used to assess the acculturation experiences and CVD self-care behaviours of Chinese immigrants were selected and modified based on the phase one qualitative interview findings. This method is particularly appropriate for a research population or phenomenon that is understudied and culturally specific. Thus, a review of existing instruments prior to use was conducted to ensure that they were relevant and culturally sensitive for the specific Chinese participants and contexts.

However, this study has some potential limitations. In terms of the sampling strategies, participants were recruited solely from metropolitan Sydney locations with a high density of

Chinese immigrants, such as Eastwood and Chatwood, and this may not be representative of other Chinese immigrant populations with CVD in Australia. This limits the generalisability of the study findings.

Data saturation was achieved for the phase one study at the 18th of the 20 interviews conducted. It is possible that, had maximum variation sampling been possible, a different and wider profiled sample of this population may have been recruited, rendering the sample more representative of this population and enhancing the transferability and generalisability of findings. However, given the limitations on the researcher's time and accessibility of this hard-to-recruit population, compounded by COVID-19 movement restrictions, the combination of purposive and snowball sampling resulted in data saturation for the study aims.

The PhD candidate, as the data collector, can only speak English and Mandarin, so this study only recruited participants who could speak English or Mandarin but excluded immigrants who only spoke Cantonese, which also limits generalisability.

Whilst there are a variety of self-care concept models and frameworks described in the literature, none have been specifically developed or modified for use with Asian immigrant populations living with chronic disease. The advantage of the middle-range Theory of Self-Care of Chronic Illness was that it has been extensively used with a wide range of populations and hence has demonstrated that it is broadly relevant across many cultural and disease groups. However, it was developed and has been predominantly used in Western-style individualistic cultural settings, with limited evidence supporting its relevance in collectivist social models such as traditional Chinese communities. As a result, this study findings may reflect a degree of individualistic bias.

During the data collection, the PhD candidate collected the phase one interview data, and the potential hierarchy power between the researcher and participants may have generated data bias. During the phase one interview study and phase two self-report survey study, participants' sense of the social desirability of responses may also have generated data bias. However, the researcher sought to counter these potential issues by providing a warm and non-judgemental environment for the interviews.

Time and logistic limitations due to COVID-19 movement restrictions also resulted in the decision not to provide the interview transcripts to participants for feedback, which might have compromised study confirmability.

Regarding the data collection instruments, the BEFF-HM and TCM belief scales for assessing acculturation were not back-translated due to the limited research time and resources available, which might have affected the measured results. However, the translation was undertaken and checked by two bilingual researchers, one of whom (the candidate) is an accredited translator. The Cronbach's alpha value of the self-care management subscale was 0.468, which indicates low internal consistency in this subscale. This can impact the reliability of the research findings regarding the self-care management behaviours among the Chinese immigrant population.

In addition, caution should be exercised in how findings are applied to Chinese immigrant populations in other countries due to differences in the healthcare systems and CVD clinical guidelines. The lack of a longitudinal perspective and limited exploration of socio-economic factors and health literacy related to self-care behaviours suggest areas for future research.

8.7 Chapter summary

This chapter addressed the four research questions of this thesis by synthesising the findings generated from the phase one qualitative data and the phase two quantitative survey data and discussing these findings in relation to relevant literature. In summary, the main findings are as follows:

- Many Chinese participants willingly engaged in CVD self-care maintenance and monitoring practices, but their self-care management in response to cardiac symptoms was often inadequate, which was consistently reported in the qualitative and quantitative findings.
- The qualitative and quantitative findings both expanded what is known of the various factors impacting CVD self-care, such as CVD-related health knowledge, personal habits, illness perspectives and experiences, social support, cultural factors, therapeutic relationships with healthcare providers, employment status and comorbidities such as arthritis.
- Chinese participants predominantly retained their Chinese culture with low levels of acculturation into Australian culture in terms of cultural practices, values and identification; this was confirmed in both the qualitative and quantitative findings. Many participants reported that they can maintain close family and social relations, utilise the

healthcare system to manage their health issues and adapt well to new lifestyles in Australia.

- The qualitative findings illustrated that the impact of acculturation on CVD self-care behaviours was complex and multifaceted, particularly in specific domains of acculturation, including cultural practices, cultural values and utilising the healthcare system. This was also reflected in BEFF-HM and TCM belief scales.

Chapter 9 Implications and Conclusion

9.1 Chapter introduction

The implications and related recommendations for clinical practice and policy, health education and future research are drawn from the findings, as discussed and summarised in Chapter 8, with the ultimate aim of improving CVD self-care behaviours among first-generation Chinese immigrants.

9.2 Implications

9.2.1 Implications for clinical practice

The National Safety and Quality Health Service (NSQHS) Standards were originally developed in 2014 and updated in 2021 to provide a quality assurance mechanism to assess how a healthcare organisation meets the expected standards of safety and quality of care in Australia (Australian Commission on Safety and Quality in Health Care, 2021). One of the key NSQHS Standards is partnering with patients; they express that a person-centred healthcare system should partner with patients in their own care and engage them in the development and design of quality healthcare. Specifically, clinicians should encourage and support patients from culturally and linguistically diverse (CALD) backgrounds to actively engage in their own care by providing health information and education, and incorporate patients' personal views and experiences (Australian Commission on Safety and Quality in Health Care, 2021).

This study has revealed the comprehensive experiences of living with CVD from the perspective of first-generation Chinese immigrants in Australia. Chinese participants in this study actively took part in their CVD self-care. However, many practices they described were not in line with evidence-based practices in Australia, so they failed to meet local standards for adequate self-care. Some Chinese participants also strongly desired guidance from clinicians for CVD self-care behaviours but perceived that this was lacking. This could be partially attributed to the lack of access to culturally and linguistically appropriate CVD health education resources. Consequently, healthcare services may not achieve person-centred care and may not meet the needs of patients from CALD backgrounds.

Some practical recommendations from this study are offered to help address this gap and optimise culturally competent practices for achieving the NSQHS Standard (Australian

Commission on Safety and Quality in Health Care, 2021) and meet the NSW strategic statewide policy that aims to provide people from CALD backgrounds with equitable access to culturally responsive, safe and high quality health services (Health and Social Policy, 2019). These recommendations are helpful for policymakers, healthcare organisations and clinicians who practice at primary, cardiac specialist and hospital care settings and partner with CALD patients in their own CVD care.

9.2.1.1 Recommendation 1: Address the educational needs of clinicians to care for CALD people living with CVD

While clinicians are committed to supporting patients from CALD backgrounds to actively engage in their own care, they may not have sufficient cultural-related knowledge and skills to effectively partner with CALD people to develop their CVD self-care practices. Existing multicultural health policies and guidelines and health organisation training sessions commonly illustrate actions or strategies to meet the general health needs of the population from the CALD community rather than specific CVD self-care (Aged Care Sector Committee Diversity Sub-group, 2019; Health and Social Policy, 2019). Thus, professional health education is required to address the knowledge and skills gap and further enhance clinicians' cultural awareness and competency when interacting with CALD people living with CVD.

1-1 Federal or state governments should fund research investigating CVD self-care behaviours and related cultural factors among people from CALD backgrounds to build evidence and develop multicultural self-care education and practice training for clinicians.

Thesis chapter reference: 8

1-2 Healthcare organisations are suggested to implement a professional development program of cultural awareness and competence for clinicians that is tailored to the needs of the CALD population living with CVD, which can be incorporated into online continuing practice development training models.

Thesis chapter reference: 8

9.2.1.2 Recommendation 2: Assess patients' CVD self-care behaviours

This study indicates that the CVD self-care behaviours of the Chinese immigrant population were complex and individualised. Many of their self-care behaviours were not evidence-based. Thus,

it could be valuable for clinicians to proactively assess Chinese patients' self-care behaviours before providing person-centred and evidence-based CVD health education to improve their knowledge, skills and engagement in CVD self-care.

2-1 Assessment of the self-care behaviours of Chinese immigrants with CVD is recommended prior to the delivery of individualised health education for patients. Regular and ongoing assessment of self-care behaviours is encouraged as best practice, as health behaviours can change over the course of the CVD trajectory. Considering the limited consultation time available for primary care, cardiac specialist care and outpatient clinical care consultations, patients are encouraged to self-check their CVD self-care practices by filling out an assessment scale during registration. Thus, clinicians could offer specific feedback or instructions to patients based on their self-care assessment results.

Thesis chapter reference: 2, 4, 5 and 8

2-2 A validated assessment scale is recommended to be integrated into clinical practice to assess the CVD self-care behaviours among this population, such as the validated SC-CHDI (available at: <https://self-care-measures.com/available-self-care-measures-patient-versions/self-care-of-coronary-heart-disease-inventory-patient-version/>). The assessment scale could be checked by clinicians or self-filled by patients attending primary, cardiac specialist and hospital care settings via selecting the preferred language version.

Thesis chapter reference: 4, 5 and 8

9.2.1.3 Recommendation 3: Screen for facilitators and barriers to CVD self-care

This study demonstrated that a range of factors can affect the uptake of CVD self-care behaviours among this population. Specifically, the acculturation experiences of Chinese participants were individualised and multifaceted, and these unique acculturation experiences permeated every domain of CVD self-care to various degrees. Acknowledging and screening these factors can assist clinicians in identifying the populations at high risk of poor performance of CVD self-care behaviours and enable them to provide individualised support. Moreover, taking time to further understand the acculturation experiences of the Chinese immigrant population can avoid cultural stereotypes and improve clinicians' cultural awareness and sensitivity, which will facilitate the provision of culturally competent practices.

3-1 Clinicians in primary care, cardiac specialist care and hospital settings are recommended to be aware of and assess factors known to affect CVD self-care behaviours, such as age, employment status, living status, CVD admission history, place of diagnosis, comorbidities, personal habits, illness experiences, social support, CVD-related health knowledge and neighbourhood environment, and provide and refer patients to available services and resources to assist Chinese patients engage in their CVD self-care.

Thesis chapter reference: 4, 5 and 8

3-2 Clinicians should acknowledge that acculturation experiences among this population affect CVD self-care behaviours. If consultation time allows, clinicians are encouraged to explore the potential challenges adapting to life in Australia to identify any acculturation-related barriers that may place this population at risk of poor performance of CVD self-care behaviours (such as changes in family relationships post-migration, challenges in maintaining social networks in Australia, difficulties in accessing the healthcare system, barriers in adapting to the new language and lifestyle in Australia).

Thesis chapter reference: 6, 7 and 8

9.2.1.4 Recommendation 4: Provide culturally appropriate health education

The completion of the above assessments (recommendations 1, 2, 3) will enable clinicians to comprehensively understand the CVD self-care behaviours and acculturation experiences among Chinese patients living with CVD, which will prepare clinicians to proactively and productively partner with Chinese patients on their CVD self-care by providing culturally appropriate health instruction.

4-1 Clinicians in primary care, cardiac specialist care and hospital settings are encouraged to provide Chinese immigrants with culturally concordant instructions to practice evidence-based CVD self-care. For example, clinicians can encourage patients to retain healthy culturally related practices (in dietary behaviours, exercise preference and stress management) and correct some poor practices by introducing Western-style healthy lifestyle recommendations tailored to their preferences. Clinicians are also encouraged to briefly introduce the healthcare system in Australia to Chinese immigrants, encourage them to use interpreter services or devices to actively access medical services, particularly in allied health and acute services, and refer them to culturally and linguistically appropriate health services and social support resources.

Thesis chapter reference: 4, 5, 6, 7 and 8

4-2 Importantly, clinicians should be culturally sensitive when assessing the medication histories of Chinese patients with CVD, particularly for those initially diagnosed and treated in China. Medication history checklists should routinely contain specific questions about the use of TCM, such as the medication brand, the forms of TCM (traditional Chinese herbs or patent medication), route of administration, dose and frequency, duration and indication of using TCM.

Thesis chapter reference: 4, 5, 6, 7 and 8

4-3 As appropriate, family members should be involved in CVD self-care plans and health instructions where this is possible and where patients consent to this.

Thesis chapter reference: 4, 6 and 8

9.2.2 Implications for developing CVD health education programs

The NSQHS Standards require hospitals to provide comprehensive care for patients from diverse communities, which includes that patients should be partners in developing and evaluating the health education provided to them. Moreover, this health information should meet the patients' needs (Australian Commission on Safety and Quality in Health Care, 2021).

This study showed that confidence in health knowledge was positively associated with CVD self-care behaviours, and Chinese immigrants who searched for Western-resourced CVD health information had better self-care behaviours than those who searched for Chinese-resourced health information. However, the participants showed poor confidence in CVD health knowledge and had limited access to mainstream evidence-based health information in Australia, particularly those living with chronic coronary heart disease who had not experienced acute cardiac-related hospitalisation.

To align with the NSQHS Standards and address the health literacy gap in this population, it is recommended that culturally and linguistically appropriate health education materials and programs are developed to equip Chinese immigrants with the knowledge and skills necessary to perform evidence-based CVD self-care behaviours. These should encompass health education content that is relevant to patients' needs and be feasible, culturally concordant and accessible.

9.2.2.1 Recommendation 1: Ensure the relevance of CVD health education content

The literature review and study findings identified that a number of specific CVD self-care activities were performed inadequately, and evidence-based health education materials were required by these Chinese immigrants. These findings indicate target areas for developing health education materials to meet patients' needs.

1-1 For CVD self-care maintenance, concrete examples should be provided of what comprises the national recommendations, for example:

- heart-healthy diets (specifying what are healthy food ingredients, how to cook healthily and serving portion sizes)
- standard physical activities (specifying recommended types and intensity of exercise)
- medication for managing risk factors and symptoms (specifying what each medication is for and how to take it)
- stress management (specifying coping skills and where to go for support services)
- regular cardiac follow-up care (specifying why it is important to attend follow-up consultations, even when asymptomatic)
- sleep quality (specifying how sleep hygiene can help with sleep)
- smoking cessation (specifying medication assisted cessation and smoking cessation services).

Thesis chapter reference: 4, 5 and 8

1-2 For CVD self-care monitoring, clear explanations of the following care are recommended:

- the bodily symptoms and signs of heart or stroke conditions and medication side effects
- how to self-measure body signs at home (specifying what, when and how often to check them, how to accurately self-check weight, blood pressure and blood sugar and how to interpret the results).

Thesis chapter reference: 4, 5 and 8

1-3 For CVD self-care management, it is important to explain to patients how to quickly respond to signs or symptoms indicative of a heart attack, cardiac event or stroke episode that is aligned with treatment guidelines in Australia. Instructions should be given on how to manage medication side effects and changes in body symptoms and signs, and these should be included in health education materials.

Thesis chapter reference: 4, 5 and 8

9.2.2.2 Recommendation 2: Ensure the feasibility of CVD health education content

A range of factors were identified as influencing CVD self-care behaviours in this study, including personal habits, employment status, comorbidities, neighbourhood environment and the availability of devices for measuring body signs.

2-1 When developing CVD-related health education materials, personal habits, employment status, comorbidities, neighbourhood environment and the availability of devices measuring body signs should be considered to enhance the feasibility of engagement in CVD self-care. Examples should be provided of a range of healthy options that patients can choose to meet their personal habits, particularly in relation to healthy diets and physical activities. Considering that employed people may have restricted time without flexibility, practical self-care tips that fit their work situations should be provided.

Thesis chapter reference: 4, 5 and 8

2-2 Comorbidity complicates the uptake of CVD self-care. Health education materials should include recommendations addressing concerns about concomitant conditions, such as what is safe to eat when taking warfarin, how to exercise with arthritis and how to take multi-prescribed medications safely.

Thesis chapter reference: 4 and 8

2-3 Where possible, the resources of the local neighbourhood environment should be considered when offering health guidance (e.g., where to access healthy food, safe environments for exercise and options for attending follow-up if transportation is a problem).

Thesis chapter reference: 4 and 8

9.2.2.3 Recommendation 3: Ensure the cultural concordance of CVD health education content

In this study, Chinese immigrants mainly retained Chinese traditional culture with a low level of acculturation in terms of dietary preferences, social networks, language and media use, traditional cultural values and family relationships. The impact of these acculturation

experiences on CVD self-care behaviours was complex and multifaceted. Thus, it is essential that health education is culturally concordant with the Chinese immigrant population to enhance their CVD self-care engagement.

3-1 Recommendations about healthy diets should be in line with Chinese dietary culture.

Western-style healthy diets can be introduced to provide more options for Chinese immigrants. Older Chinese immigrants often prefer walking and group-based exercises such as Tai Chi and square dancing, and information should be tailored to meet their preferences. Recommendations should include information on exercise intensity and duration to target these culturally preferred physical activities.

Thesis chapter reference: 6 and 8

3-2 The potential for adverse interactions if integrating TCM alongside prescribed Western medications should be explained. It is recommended that the use of TCM as a first-line medication for managing angina or cardiac events be discouraged.

Thesis chapter reference: 6 and 8

3-3 Chinese immigrant populations should be directed to sources of information about the healthcare system in Australia. This should include professional services for managing stress and culturally and linguistically concordant mental health services, such as The Transcultural Mental Health Centre.

Thesis chapter reference: 6, 7, 8

9.2.2.4 Recommendation 4: Ensure the accessibility of CVD health education resources

A strong desire to access mainstream evidence-based health information was expressed by members of the Chinese immigrant population living with CVD. Thus, it is recommended that avenues are made available to widen their access to mainstream CVD health education materials.

4-1 In hospital settings, ward nurses can provide CVD health education in person with paper-based or electronic brochures and can refer patients to cardiac rehabilitation services for more CVD-related health information. In primary care, cardiac specialist care and outpatient clinical settings, and during medical follow-up consultations, clinicians are recommended to routinely provide health education materials to Chinese patients living with CVD and encourage them to read through the materials and ask questions at their next visit. Both English and Chinese versions of the materials should be available in the form of printed brochures, smartphone apps and websites according to patients'

preferences. Clinicians can also refer patients to authorised online resources regarding CVD health education.

Thesis chapter reference: 4, 5, 6, 7, 8

4-2 Support should be leveraged from the peak national non-governmental organisations (such as the National Heart Foundation of Australia and Stroke Foundation) to sponsor the development of CVD secondary prevention and management education materials to teach and support people from CALD backgrounds about self-care for their CVD in community settings. Interactive self-care education materials tailored to various CALD populations should be available in the phone apps and websites of national organisations, which should have multi-language features and downloadable health education materials in different languages.

Thesis chapter reference: 4, 5, 6, 7, 8

4-3 Community resources are rarely integrated into the care of people living with CVD, which leaves a range of resources untapped. Community links could be created to ensure that CVD self-care support continues beyond medical services. To implement this, Chinese or multicultural community resources could be leveraged to widen access to CVD-related health education information and materials, for example, holding CVD health talks in Chinese community associations and partnering with Chinese media (e.g., the SBS Chinese program, 2AC Chinese radio and WeChat) to deliver health education materials. In addition, local libraries and community centres—vital resources for public health promotion—can be effective partners in delivering CVD health knowledge programs to the CALD community.

4-4 Apart from the support from these community stakeholders, government sponsorship could be sought for setting up these multicultural community health events to strengthen the capacity of CVD health education programs to deliver information to people from CALD backgrounds and coordinate the provision of multilingual health information.

Thesis chapter reference: 4, 5, 6, 7, 8

9.2.3 Implications for future research

Although this study comprehensively explored the self-care behaviours among first-generation Chinese immigrants living with CVD, some questions remain unanswered:

- Given the limitation of the CVD self-care scales used in this study for measuring adherence to a healthy diet and exercise intensity, it is suggested that future research specifically assesses the dietary and exercise behaviours among Chinese immigrants living with CVD using quantitative study designs. Due to a lack of understanding of how Chinese immigrants self-check their blood pressure at home, a future qualitative study is needed to explore the experiences and perceived barriers to self-checking blood pressure at home among this population. In addition, as self-care behaviours can change over the course of the CVD disease trajectory, longitudinal study designs are needed to provide insight into the dynamic process.

Thesis chapter reference: 5, 6 and 8

- Given the complex nature of acculturation, for future research, it is important to choose appropriate and feasible acculturation scales to measure the level of acculturation in immigrant populations.

Thesis chapter reference: 7 and 8

- More research is needed to provide insight into CVD self-care and related acculturation factors among people from different CALD groups. Simultaneously, it is important to conduct research to explore clinicians' experiences of caring for CALD patients living with CVD for the development and delivery of CVD health education materials. An effective trial is required to demonstrate whether these health education materials can improve CVD self-care behaviours and CVD outcomes and whether the delivery of education materials is cost-effective for people from CALD backgrounds.

Thesis chapter reference: 4, 5, 6, 7 and 8

9.3 Conclusion

The research detailed in this thesis has made a valuable contribution to comprehensively describing the self-care behaviours among first-generation Chinese immigrants living with CVD in Australia and the impact of acculturation on their self-care behaviours. Although Chinese immigrants actively engaged in their CVD self-care practices, particularly in self-care maintenance and monitoring, many of these practices were not evidence-based and were inadequate, particularly in response to acute cardiac events or stroke episodes. This can be

blamed on their poor disease-related health knowledge and a lack of access to mainstream evidence-based CVD health information. This indicates an urgent need to develop and deliver linguistically and culturally appropriate CVD-related health education information to this population. Partnering with community resources such as Chinese community organisations offers an innovative route to co-design and deliver targeted CVD health education interventions and support for this population.

This research also explored a range of socio-economic, cultural, clinical and personal factors impacting Chinese immigrants' CVD self-care. Assessment of these factors could support better triaging and enable clinicians to identify Chinese patients at high risk of performing poor self-care and better targeting of support for self-care engagement. Further, the research underscored the role of acculturation in performing CVD self-care among Chinese immigrants and provided knowledge for clinicians to enhance their cultural awareness and sensitivity towards Chinese immigrants. Specifically, the acculturation experience of Chinese immigrants is multifaceted and individualised. Thus, to avoid stereotypical responses and enable culturally competent practice, clinicians are recommended to evaluate their patients' acculturation experiences and provide culturally acceptable practices.

Finally, a comprehensive range of recommendations was provided to enhance future self-care in this population. Recommendations were made for education and to better support clinicians in their ability to assess, triage and target patients for the provision of patient-centred, culturally appropriate education and care that meets their needs and preferences. By recognising that time and resource limitations restrict the degree to which primary, secondary and tertiary care providers are able to expand on current service provision, the recommendations aim to broaden engagement with the range of potential health providers to include voluntary and non-governmental agencies and to engage families with the provision of support, as appropriate and available. Future research is needed to identify and address ongoing gaps in knowledge in relation to the self-care behaviours and acculturation among first-generation Chinese immigrants living with CVD in Australia.

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SPECIAL ISSUE REVIEW

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Self-care behaviours and related cultural factors among Chinese immigrants with cardiovascular disease in western countries: an integrative review

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Abstract

Aims and objectives: This review aimed to demonstrate the self-care behaviours of first-generation Chinese immigrants with cardiovascular disease in western countries and identify related cultural factors.

Background: Self-care is the cornerstone to mitigate disease symptoms and maintain health status. Chinese immigrants to western countries, operating within a cross-cultural context, may find self-care to manage their cardiovascular disease challenging.

Design: An integrative review was conducted.

Methods: Seven databases were searched Scopus, ProQuest Health & Medicine, Medline (Ovid), Embase (Ovid), AMED (Ovid), PsycINFO and CINAHL, with output limited to peer-reviewed studies published from 2000 to 2020 in English or Chinese. Initially, 2037 papers were screened. Six papers were retained and critiqued using the Joanna Briggs Institute critical appraisal tools. Deductive and inductive approaches were utilised to analyse the findings. The PRISMA 2020 checklist informed review reportage.

Result: In general, Chinese immigrants with cardiovascular disease took an active role in management of their cardiovascular disease, including through diet and activity adaptation and adherence to western medication. Families also played a significant role in disease decision-making and management. However, language and cultural barriers impeded their access to health information and resources in host countries.

Relevance to clinical practice: Understanding self-care behaviours and associated cultural factors among Chinese immigrants with cardiovascular disease is important to improve nurses' culturally sensitive practices and provide tailored health education interventions to promote self-care behaviours among immigrant populations. The scarcity of literature on self-care behaviours among Chinese first-generation immigrants with cardiovascular disease indicates the need for further research in this area. Development of culturally and linguistically sensitive health resources and education programs is urgently needed.

KEY WORDS

cardiovascular diseases, Chinese immigrants, cultural factors, health behaviours, secondary prevention, Self-care, self-management

1 | INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality globally (World Health Organization, 2020) and a major issue among many immigrant ethnic groups (Agyemang et al., 2012). Evidence-based self-management or self-care is the cornerstone of mitigating CVD symptoms and maintaining health status (Riegel et al., 2017). However, the nature of CVD self-care is complicated and associated with a myriad of individual, social and cultural elements (Riegel et al., 2017). This is particularly the case for immigrant populations with CVD operating within a cross-cultural context.

Chinese immigrants are one of the largest and fastest growing ethnic populations in the world (Gong & Zhao, 2016). The most popular western countries to which Chinese populations migrate are the United States, Canada, Australia, New Zealand and the United Kingdom (Department of Economic & Social Affairs, 2019; Li et al., 2018). It has been widely reported that Chinese immigrants experience disadvantageous CVD profiles, with increased CVD risk factors, higher CVD prevalence and poor disease outcomes (Gong & Zhao, 2016; Jin et al., 2015, 2017). For example, considering CVD risk factors, Chinese immigrants have higher prevalence of diabetes and greater physical inactivity than white populations (Jin et al., 2017). Longer duration of residence in western countries has been significantly associated with higher risk of diabetes and demonstration of more than three risk factors (Jin, Gullick, et al., 2017). A systematic review including 16 papers with 258,474 Chinese participants revealed that Chinese immigrants' prevalence and mortality from coronary heart disease was higher than that of the comparable population of mainland Chinese people (Gong & Zhao, 2016). Another systematic review and meta-analysis of eight cohort studies with 2–20 years follow-up found Chinese immigrants had a higher short-term mortality after a diagnosis of CVD than white populations (Jin et al., 2015). Therefore, it is important to consider how Chinese immigrants manage their CVD in western countries.

Self-management is an umbrella term which involves a series of daily activities or behaviours which an individual performs to maintain or improve their health status (Clark et al., 1991). The term self-management is employed interchangeably with self-care in some literature but for consistency, self-care is used in this review. In 2012, Riegel, Jaarsma & Strömberg developed the Middle-Range Theory of Self-Care of Chronic illness, which has been widely cited in self-care research. Grounded on Dorothea Orem's theory of self-care (Orem et al., 2001, p. 143), Riegel's model specifies three core concepts in self-care behaviours: self-care maintenance, self-care monitoring and self-care management (Attaallah et al., 2021; Riegel et al., 2012). Self-care maintenance refers to the behaviours practised to preserve health status, such as lifestyle modification and medication adherence, which is mostly what is investigated in current self-care literature (Riegel & Jaarsma, 2021). It is well-known that self-care can improve clinical outcomes with lower cardiac mortality and hospital readmissions as well as nonfatal myocardial infarctions (Janssen

What does this paper contribute to the wider global clinical community?

- The scarcity of literature on self-care behaviours among Chinese first-generation immigrants with cardiovascular disease indicates the need for further research in this area.
- In general, Chinese immigrants with cardiovascular disease took an active role in management of their cardiovascular disease, with families also playing a significant role in disease decision-making and management. Thus, family as well as patient involvement in self-care education is important.
- Culturally and linguistically sensitive health resources and education programs are urgently needed.

et al., 2013; Riegel et al., 2017). However, the complexities of self-care practices challenge patients (Riegel et al., 2017, 2019).

Self-care behaviours are embedded in every aspect of daily life, associated with a range of factors including patients' experience and skill, motivation, cultural traditions, daily routines or habits, social support and access to care (Jaarsma et al., 2020; Riegel et al., 2012). Accordingly, it can be particularly difficult for Chinese immigrants who also need to work between two cultures, negotiating differences between eastern and western forms of knowledge, health beliefs, practices and systems. In Western Europe, Chinese immigrants have been reported with poor CVD risk factor management, with increased prevalence of nonfatal myocardial infarction (Chiu et al., 2010). Cultural factors have been widely reported as determinants of CVD self-care behaviours among Chinese immigrants and described as related to language barriers, different cultural beliefs, family support and healthcare systems (Jin et al., 2020; King et al., 2007; King-Shier et al., 2018; Osokpo & Riegel, 2019; Wang & Matthews, 2010).

Better understanding of self-care behaviours and related cultural factors is important to improve nurses' culturally sensitive practices and develop culturally appropriate health education programs and services to improve Chinese immigrants' self-care skills for CVD and to minimise cardiovascular health disparities. However, literature on this topic among Chinese immigrants is scarce (Jin et al., 2020; Osokpo & Riegel, 2019; Zhang et al., 2018). Studies mainly report aggregated data on CVD risk in primary prevention and collate Chinese immigrants within a broad pan-Asian ethnicity (Zheng et al., 2019). Additionally, most studies focusing on CVD secondary prevention fail to distinguish Chinese first-generation immigrants (those born in the country of origin who migrate to a host country) from second-generations (the children of first-generation migrants, born in the host country) or Chinese populations of mixed ethnic backgrounds, whose self-care practices may all vary significantly depending on the level of acculturation (Bainey et al., 2018; Khan et al., 2017).

Therefore, this review aimed to address the gap in knowledge by demonstrating the self-care behaviours and related cultural factor reported among first-generation Chinese immigrants with CVD in western countries.

2 | METHODS

Given the multiple different approaches potentially used by literature on this topic, the methodology of an integrative review was chosen to allow the combination of differing types of data on the CVD self-care behaviours among Chinese immigrants. The integrative review process proposed by Whittemore and Knafl (2005) was utilised, involving (1) problem identifications; (2) literature search; (3) data evaluation; (4) data analysis; and (5) presentation. The review was registered in PROSPERO with registration number: CRD42020214634. The systematic process of the review was reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist (Page et al., 2021) (see Supplementary file 1: PRISMA 2020 checklist).

2.1 | Problem identification

The problem that the review sought to address was the gap in knowledge set out in the following review questions:

- 1) What self-care behaviours are used by Chinese immigrants with CVD living in western countries?
- 2) What cultural factors have been related to these self-care behaviours?

2.2 | Literature search

2.2.1 | Literature search strategies

After identifying the review questions, a comprehensive computer-assisted search strategy was developed by combining key terms (Table 1). With the assistance of a librarian, a proximity search strategy was employed to render the search more specific. Seven databases were targeted for searching Scopus, ProQuest Health &

Medicine, Medline (Ovid), Embase (Ovid), AMED (Ovid), PsycINFO and CINAHL, with output limited to peer-reviewed studies published from 2000 to 2020 in English or Chinese (see Supplementary file 2: Database search results). The search terms expressed three concepts pertinent to the review aims, including key terms or synonyms from other review studies (Hooper et al., 2018; Zhang et al., 2018). Reference lists of included studies and literature reviews as well as some relevant studies from an ancestry search were also searched to maximise the number of eligible primary sources and reduce the search bias.

Endnote X9 was employed to manage and screen the search output. Following removal of duplicates, an initial screening of title and abstract was undertaken to exclude studies irrelevant to the review aims. The full text of remaining studies was read for eligibility in accordance with inclusion and exclusion criteria. The final included papers were screened by two researchers for rigour using the software package Covidence. Where there was disagreement, this was discussed by three researchers until consensus was reached.

2.2.2 | Selection criteria

Inclusion criteria:

- Peer-reviewed full-text report of primary research.
- Participants were Chinese first-generation immigrants to western countries.
- Participants had self-reported or medically diagnosed coronary heart disease, stroke or heart failure.
- The paper reports self-care behaviours, such as diet, physical activities, medication adherence or health seeking behaviours.

In this review, the term Chinese first-generation immigrants refer to Chinese people from and born in Mainland China, Hong Kong, Macao or Taiwan who migrated to western countries such as America, Canada, UK, Australia, New Zealand and European countries (Zhang et al., 2018). Based on the WHO, 2021 definition, this study mainly focused on coronary heart disease, stroke and heart failure. Self-care behaviours were defined in line with Osokpo and Riegel (2019) systematic review where the most common elements

TABLE 1 Search terms

Concept 1 Chinese immigrants	AND	Concept 2 cardiovascular disease	AND	Concept 3 Disease self-care behaviours
chin* W/4 (immigr* OR ethnic* OR cald OR migra*)		cardio* OR cardia* OR 'heart failure' OR heart* OR coronary* OR angina* OR myocard* OR isch?em* OR stroke OR strokes OR poststroke OR post-stroke OR cerebrovasc* OR 'cerebral vascular' OR brain* OR infarct*		experienc* OR prevent* OR manag* OR self-management OR behav* OR adjust* OR rehab* OR care*OR self-care OR diet* OR exercis* OR 'physical activit*' OR medication OR health-seeking OR care-seeking OR seek*OR respon* OR lifestyle* OR life-style*

of self-care were listed as diet, exercise, medication adherence and health seeking behaviours.

Exclusion criteria:

Studies were excluded if they investigated second-generation or mixed-ethnicity Chinese immigrants. 'Second-generation immigrants' are people born and living in the host (immigrant) countries (such as the UK, Australia) with at least one of their parents born overseas (in, for example, China) (Afable-Munsuz et al., 2010); 'Mixed Chinese' were people reported with both Chinese and other ancestries (Jin, Neubeck, et al., 2017).

This review focused on secondary prevention and management of CVD, and excluded the papers solely focused on CVD primary prevention (addressing, for example, hypertension and diabetes) (WHO, 2021). Papers targeting smoking and drinking practices were excluded as these characteristics are not commonly included within the definition of cardiovascular disease self-care (Osokpo & Riegel, 2019). Papers only reporting medical management (such as medications prescribed) rather than patient self-care behaviours (e.g. medication adherence) were also excluded.

In summary, from the initial search output of 2037 papers in seven databases, 6 papers were included for the analysis. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses PRISMA 2020 flowchart (Page et al., 2021) (Figure 1) indicates papers at each stage of review.

2.3 | Data evaluation

The Joanna Briggs Institute (JBI) critical appraisal tools (Lockwood et al., 2020; Moola et al., 2020) were employed to critique included studies, targeting the methodological quality of each study by assessing the possible biases of each research design, conduct and analysis.

Following discussion and selection of the most appropriate JBI appraisal tool in line with the study design or methodology, one researcher assessed the study quality and a second researcher independently scored the study. If there were discrepancies, this was discussed and agreed. No cut-off point was applied for rating the study quality, and the quality score was not an inclusion criterion in this review (Table 2). Three qualitative studies scored highly, indicating high methodological quality, while three quantitative survey studies achieved over half of the maximum score.

2.4 | Data analysis

Following Whittemore and Knafl (2005) guideline, essential data were extracted from included studies. One researcher extracted the data, which were checked independently by one of the two other authors for accuracy and rigour. The extracted data were tabulated to assemble the primary study data in line with two review questions. A combination of deductive and inductive approaches was utilised to analyse and synthesise the findings (Younas et al., 2021).

To address the first review question, an initial subgroup classification (Whittemore & Knafl, 2005; Younas et al., 2021) was set up, based on the preconceived main elements of CVD self-care behaviours as reported by Osokpo and Riegel (2019). Additional characteristics were sought emerging from the findings of included studies. During the re-reading process, relevant data were grouped and entered into the concept matrix under the subgroup classifications (see Supplementary file 3: Table S1). For the concept matrix, the quantitative numerical data were interpreted and transformed into textual data. For example, the reported p-values of the extracted data from quantitative studies, were rendered into textual data as 'significant' or 'not significant' in relation to key finding statements. Data were categorised and synthesised, using constant comparison across studies to seek patterns of similarity and difference (Whittemore & Knafl, 2005). Findings were then synthesised narratively to draw conclusions to answer the first review question.

For the second review question, a comprehensive definition of cultural factors developed for use in health practice settings was used, including the country of origin, languages spoken, family roles, gender roles and culture-related lifestyles (Purnell, 2018, pp. 61–71). Relevant data were extracted into second data extraction table. Additional culturally based factors were grouped under the theme of other cultural factors. The grouped data were charted in the second concept matrix (see Supplementary file 4: Table S2) related to the impact of cultural factors on self-care behaviours. Using the same approach as for the first review question, the data were grouped under subthemes, compared and synthesised to draw conclusions to address the second review question.

During the data analysis, the researcher re-read the included papers and took notes to create an audit trail for potential interpretational and synthesis bias. Potential biases were discussed among the three authors. The researcher repeatedly checked the final synthesised results to ensure that no key findings were missed.

3 | RESULTS

3.1 | Study and participant characteristics

Six studies were included in this review (Table 3). Three papers utilised quantitative methods, while three employed qualitative methods including grounded theory and descriptive qualitative approaches. Five studies were conducted in Canada (Fredericks, 2012; King et al., 2007; King-Shier et al., 2017, 2018, 2019), and one in Australia (Jin et al., 2020). Four studies focused on multi-ethnicity comparisons. Study objectives varied from a single focus, such as cardiac medication adherence and time to emergency department response to chest pain, to broader general self-care behaviours.

The sample size of the six included papers ranged from 9 to 216 participants per study. The average age of the sampled Chinese informants was over 63 years, and the proportion of males ranged from 54.4% to 71.3%, except that one study (Fredericks, 2012) did not provide age or sex data. These participants were predominantly

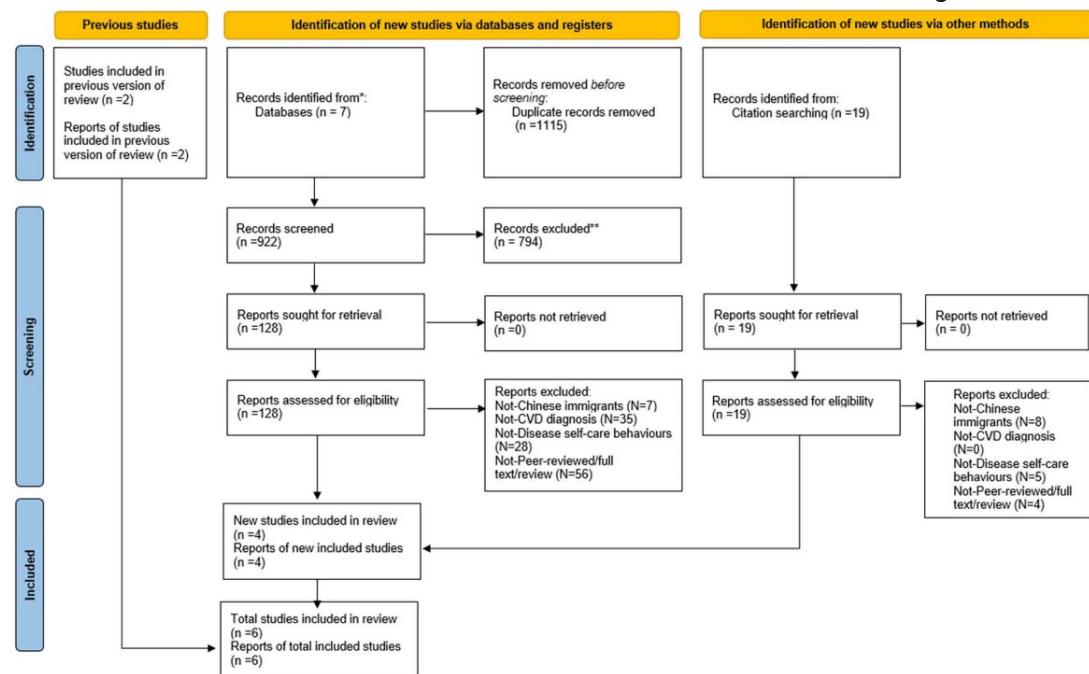


FIGURE 1 PRISMA 2020 flow chart for updated systematic reviews which included searches of databases, registers and other sources

recruited and data were collected in a hospital setting, with two undertaken in the community.

3.2 | Review question 1: Self-care behaviours

Five papers included data that addressed the first review question regarding self-care behaviours among Chinese immigrants living with CVD (Jin et al., 2020; King et al., 2007; King-Shier et al., 2017, 2018, 2019). All data were related to the four subgroups of dietary adjustment, physical activity, medication adherence and health seeking behaviours; no other self-care behaviours were reported.

3.2.1 | Dietary adjustment

Changing daily dietary habits in line with recommendations that have been established for CVD health is an essential element of self-care behaviours after a CVD diagnosis. Two studies investigated the Chinese participants' dietary adjustments. These Chinese immigrants actively modified their diets following their CVD diagnosis. One qualitative study (Jin et al., 2020) reported all participants in the study changed to a healthier diet by reducing salt, fat, higher glycaemic index carbohydrates and sugar after their CVD diagnosis. In another study (King et al., 2007), one participant was reported

as making a decision to adjust his diet pattern straight away when he was told of the CVD diagnosis. Many participants chose to eat home-made traditional Chinese meals more frequently, explained as comprised of 'little meat with a lot of vegetables' (King et al., 2007, p. 816). To avoid overeating and maintain weight, a few Chinese participants (King et al., 2007) controlled what they ate, eating until they felt 70 to 80 per cent full.

3.2.2 | Physical activities

One study explored the exercise behaviours among Chinese immigrants with CVD in the community. These Chinese participants were reported as actively performing exercise (King et al., 2007), described as walking, Tai Chi and swimming on a regular basis. No more specific information regarding these physical activities was reported.

3.2.3 | Medication adherence

Four papers detailed the self-reported medication adherence among Chinese immigrants living with CVD. These studies showed that Chinese participants prioritised western medication rather than traditional Chinese medicine (TCM) for treating their CVD. One survey

TABLE 2 Critical appraisal of included studies

JBI critical appraisal tool for qualitative studies			
Question	Jin 2020	King 2007	King Shier 2017
1. Is there congruity between the stated philosophical perspective and the research methodology?	NA	+	NA
2. Is there congruity between the research methodology and the research or objectives?	+	+	+
3. Is there congruity between the research methodology and the methods used to collect data?	+	+	+
4. Is there congruity between the research methodology and the representation and analysis of data?	+	+	+
5. Is there congruity between the research methodology and the interpretation of results?	+	+	+
6. Is there a statement locating the researcher culturally or theoretically?	+	+	+
7. Is the influence of the researcher on the research, and vice-versa, addressed	+	+	+
8. Are participants, and their voices, adequately represented?	+	+	+
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	+	+	+
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	+	+	+
Total score	9	10	9
JBI critical appraisal tool for analytical cross-sectional studies			
Question	Fredericks 2012	King-Shier 2018	King-Shier 2019
1. Were the criteria for inclusion in the sample clearly defined?	+	+	+
2. Were the study subjects and the setting described in detail?	+	+	+
3. Was the exposure measured in a valid and reliable way?	-	-	-
4. Were objective, standard criteria used for measurement of the condition?	+	+	+
5. Were confounding factors identified?	+	+	+
6. Were strategies to deal with confounding factors stated?	-	-	-
7. Were the outcomes measured in a valid and reliable way?	+	+	+
8. Was appropriate statistical analysis used?	+	+	+
Total score	6	6	7

Note: NA=not applicable; + = Yes; - = No.

study found that 77.2% of Chinese immigrants self-reported that they took their cardiac medication consistently (King-Shier et al., 2018). This high cardiac medication adherence was positively associated with being able to afford medication, remembering to take medication (King-Shier et al., 2017) and believing they needed to take the medication (King-Shier et al., 2018). Moreover, from another interview study (King-Shier et al., 2017), participants reported that communicating effectively with physicians and accepting they needed to take the medication as a fact of life helped them take their cardiac medications consistently. In addition, they explained that they took the cardiac medications for symptom relief and disease control.

Western medications were described as the first-line treatment for their heart disease because this was perceived as an acute condition. By comparison, most Chinese participants adopted some TCM (such as Chinese herbs or acupuncture) for other chronic diseases or to promote their general health (Jin et al., 2020; King et al., 2007). For example, one participant (King et al., 2007) drank herbal tea on a regular basis to remove the lipid of greasy meals from their blood.

Some participants combined western medications with TCM when their cardiac symptoms were poorly controlled (King et al., 2007; King-Shier et al., 2017). In an interview study (Jin et al., 2020), participants said they did not disclose details of using TCM to their physicians because the physicians may be concerned at drug interactions, although it was not clear whether this applied to medication use as a primary or secondary prevention behaviour. Conversely, some participants gave up TCM due to the side effects and high price of these medicines in western countries (King et al., 2007).

3.2.4 | Health seeking behaviours

Three studies examined the Chinese immigrants' health seeking experiences, reflecting their self-care behaviours in response to their CVD diagnosis. Regarding seeking health information and resources, the majority of Chinese participants diligently and actively searched out the best health information for their CVD (King et al., 2007). For example, at an early stage of their CVD diagnosis, they immediately

sought information related to their treatment, rather than spending time coming to terms with their CVD diagnosis. In another study (Jin et al., 2020), most Chinese participants reported that they sought heart disease-related information from their friends or family who were in China, or from Chinese websites or media. Once again, the study failed to indicate if this was a primary or secondary prevention self-care behaviour.

In terms of seeking healthcare services, in two studies, all Chinese participants chose western-trained physicians for their heart disease (Jin et al., 2020; King et al., 2007). Some participants only trusted western health services for their heart disease (King-Shier et al., 2018) but preferred Chinese-speaking physicians. Moreover, they actively participated in the medical care, following up doctors' appointments and consulting with multidisciplinary health practitioners. Similarly, in a multi-ethnic study, 93% of Chinese participants consulted consistently with their doctors on cardiac medications, although the proportion was slightly lower than reported for other ethnic groups (White 100% and South Asian 94.9%). High cardiac rehabilitation attendance was reported in a Canadian study (King et al., 2007) but low attendance in an Australian study (Jin et al., 2020), with many reporting they did not know about cardiac rehabilitation programs or had no referral. In addition, one participant described in a qualitative study (Jin et al., 2020) how, being aware of their CVD diagnosis, they accessed the Emergency Department (ED) immediately when having chest pain. Conversely, a large multi-ethnic study stressed that the time taken to present to ED for symptoms of the acute coronary syndrome was too long (at 5.53 to 7.41 h) to allow effective treatments to be used, but there was no significant difference in time to ED presentation between people of White, Chinese and South Asian ethnicities.

3.3 | Review question 2: The related cultural factors

In response to the second review question, five papers examined the impact of cultural factors on the CVD self-care behaviours of Chinese immigrants (Jin et al., 2020; King et al., 2007; King-Shier et al., 2017, 2018, 2019). From general to specific self-care behaviours, studies reported the impact of language barriers, family roles, cultural beliefs, health belief systems, and other culturally based factors across the spectrum of self-care behaviours.

3.3.1 | Language barriers

Firstly, for Chinese immigrants from non-English speaking countries or with limited English proficiency, language barriers hampered their experience of seeking healthcare in their host country (Jin et al., 2020). In one study (Jin et al., 2020), one participant changed cardiac specialists multiple times until he found a Chinese-speaking cardiologist. Moreover, most participants in the study searched heart-related health information from Chinese websites, friends or family

in China. These information seeking behaviours were in part at least due to the unavailability to them of culturally and linguistically tailored health education resources and programs in their western countries of residence, and difficulties in engaging with English language information services provided in their host country (Jin et al., 2020). Conversely, in another study, the language barriers were perceived as managed well by participants' family members who played a role as interpreters in healthcare encounters (King et al., 2007).

3.3.2 | Family role

As well as interpreting health information, family played an important role in influencing participants' CVD self-care behaviours following their CVD diagnosis. This was reported as involving moving to healthy lifestyle choices and attending medical appointments (Jin et al., 2020; King et al., 2007). For example, all participants reported shifting to a healthier diet with less salt, fat and sugar following the family's suggestions (Jin et al., 2020). In terms of the gender roles in Chinese family relationships, male participants were reported to receive more support from their wives who prepared their daily meals and supervised their self-care behaviours, whereas female participants were supported more by their children (King et al., 2007). Moreover, the view of filial duty endorsed in Chinese culture helped participants manage their CVD, particularly in an extended family. Children or grandchildren often took participants for medical appointments (Jin et al., 2020).

3.3.3 | Cultural beliefs

Cultural beliefs could also influence self-care behaviours. In one study (King et al., 2007), Chinese participants reported that their traditional beliefs of keeping the peace in life or acceptance and the Confucian philosophy of staying present played a significant role in their self-care of CVD. For instance, Chinese participants in this study quickly and actively sought out the best health care rather than dwelling on their receipt of a CVD diagnosis (King et al., 2007). Similarly, this was supported by King-Shier et al. (2017) where accepting the need for cardiac medication as a part of their daily life motivated participants to take medication consistently. On the other hand, holding the cultural belief that they should take control of their own fate could negatively influence their medication adherence, where it resulted in participants making their own decisions about adjusting their cardiac medications and whether to take their medications (King et al., 2007). Furthermore, taking the decisions themselves on which medication to take could prevent patients from taking their cardiac medications consistently (King-Shier et al., 2018).

Cultural beliefs were also integrated into dietary customs, which could positively impact dietary-related self-care behaviours. Chinese participants in one study (King et al., 2007) preferred to eat homemade traditional Chinese meals with more vegetables and less meat, as this was believed to be better for their heart disease. This was in line

TABLE 3 Data extraction table

Author/ Year/Country	Study design	Research Aim	Participants	Data collection/analysis
Quantitative study data from interviews/questionnaires/medical records				
Fredericks, S 2012 Canada	A descriptive non-experimental study	To determine whether an individual's country of origin influenced performance of self-care behaviours after heart surgery	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> Underwent coronary artery bypass graft and/or valvular replacement. Spoke English. Oriented to time, place, and person. Had access to a working phone at home. <p>Participant number:</p> <p>A convenience sample of 90 patients (Chinese 11.1%)</p> <p>Chinese Characteristics:</p> <p>No indication of demographic profile</p>	<p>Demographic information was collected at 24–48 h of admission to the cardiovascular surgery units via asking patients face-to-face.</p> <p>Data related to self-care behaviours performance were collected at 1-week post-hospital discharge by telephone interview.</p> <p>Point-biserial correlation used for data analysis.</p>
King-shier, K et al, 2018 Canada	A quantitative survey study	To generate an in-depth understanding about the decision-making process and potential ethno-cultural differences, of White, Chinese, and South Asian cardiac patients when making the decision to adhere a medication regimen.	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> Selected from a cohort study of ACS patients. Additional Chinese participants were sought from a Chinese senior's cultural centre, with physician diagnosed heart disease and prescribed more than two medications for heart disease. Self-reported ethnicity as one of South Asian, Chinese, or European (White) and ability to speak English. Spoke Cantonese or Mandarin; or Punjabi or Hindi. <p>Participant number:</p> <p>286 participants including 79 Chinese</p> <p>Chinese Characteristics:</p> <p>Male 54.4%</p> <p>Mean age (SD):73.99 (10.46)</p>	<p>The surveys were undertaken by telephone by trained research assistants, or in person via interview.</p> <p>Collecting a demographic survey, ANOVA or Chi-square for data analysis.</p> <p>For medication adherence survey, Chi-squared tests or Fisher's exact tests were used.</p>
King-Shier, K et al, 2019 Canada	a cross-sectional survey	To examine potential ethnic variations in ACS symptoms and clinical care outcomes in white, South Asian, and Chinese patients.	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> Age >19 years. Admission to hospital with a confirmed diagnosis of ACS. Self-reported ethnicity for either white (European), South Asian or Chinese. Speaking English, Punjabi, Tamil, Urdu, Hindi or Gujarati, Cantonese or Mandarin. <p>Participant number:</p> <p>1334 patients including 216 Chinese.</p> <p>Chinese Characteristics:</p> <p>Mean age (SD):65.1 (12.6); Male 154 (71.3%).</p>	<p>A health record audit was undertaken to collect additional demographic and clinical data like time to ED presentation, once the participant had been discharged from hospital.</p>

Measurement tool	Main findings
Revised Self-Care Behaviour Scale with higher scores indicating more frequent performance of self-care behaviours.	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • No statistically significant relationships were noted between China and performance of self-care behaviours: $rpb(89)=-0.068, p=0.27$. <p>Cultural factors:</p> <ul style="list-style-type: none"> • None
Gladwin's ethnographic decision-tree modelling approach (stage 1 via interview, stage 2,3 via survey). This study focused on stage 3. Stage 3 survey was based on the results of stage 1 qualitative review and stage 2 pilot testing. Participants were asked to self-report adherence behaviour in the survey: 'consistently', 'sometimes' or 'not at all' adherent to their cardiac medications.	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • Self-reported medication behaviours: consistently (n=61, 77.2%), sometimes (n=18, 22.8%), not at all (n=0). • The medication adherence was significantly associated with medication affordability ($p=0.011$), challenges in remembering to take medication, ($p<0.001$), doubt about the need to take medication ($p<0.001$), making own decision on which medications to take ($p=0.027$). • Compared to white (100%) or South Asian (94.9%), Chinese were least likely to continue to consult with doctor about medications (93%, $p=0.047$). <p>Cultural factors:</p> <ul style="list-style-type: none"> • The belief that the need to take the prescribed medication was significantly associated with medication adherence ($p<0.001$). • Self-decision on which medication to take was significantly associated with medication adherence ($p=0.029$).
A health record audit	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • Regarding any mid-sternal pain/discomfort: Mean time (SD) to ED presentation among Chinese with typical and atypical symptoms were: 5.92h (5.49) and 7.41 h (6.10), $p=0.176$. While white were 6.43 h (5.77), 6.11h (5.53), $p=0.591$; South Asian were 5.69 h (5.35), 7.17 h (5.94), $p=0.037$. • Regarding any mid-sternal with left neck, shoulder, or arm pain/discomfort: Mean time (SD) to ED presentation among Chinese with typical and atypical symptoms were: 6.0 h (5.65), 6.31 h (5.62), $p=0.726$; While white were 6.41 h (5.82), 6.31 h (5.57), $p=0.836$; South Asian were 5.53 h (5.35), 6.42 h (5.60), $p=0.092$. <p>Cultural factors:</p> <ul style="list-style-type: none"> • Ethnicity is related to the time presenting to ED, although the difference is little.

(Continues)

TABLE 3 (Continued)

Author/ Year/Country	Study design	Research Aim	Participants	Data collection/analysis
Qualitative study data from interviews				
Jin, K, et al, 2020 Australia	A descriptive Qualitative study	To investigate multilevel and interactive elements of individual, family, institutional, community, and policy factors that influence engagement with CHD primary and secondary prevention among Chinese immigrants and their family carers using a social-ecological model lens.	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Chinese immigrants born in China, including Hong Kong. • Experienced a CHD diagnosis or event in the previous 6 months. • Eligible to attend CR. • Carer participants were a close family member of a patient. <p>Participant number:</p> <p>Sample (9 patients, 9 carers):</p> <ul style="list-style-type: none"> • 12 CHD patient journeys (a narrative about a CHD experience provided by either a patient or their carer). • 6 dyads where the patient and carer were related. <p>Chinese Characteristics:</p> <p>Patient participants: median age 70 (55–82) Female: male (3:6).</p>	<p>Recruitment from two publicly funded, tertiary hospitals in New South Wales, participants were approached by CR coordinators.</p> <p>A single, semi-structured interview using an interview guide was conducted.</p> <p>Code analysis considered under the framing of the SEM categories to provide a socioecological explanation for health understandings and behaviours.</p>
King, K.M, et al, 2007 Canada				
King, K.M, et al, 2007 Canada	A grounded theory	To describe and explain the influence of Chinese ethno-cultural affiliation and gender on the process that Chinese cardiac patients undergo when faced with making behaviour changes associated with reducing their CVD risk.	<p>Inclusion criteria:</p> <ul style="list-style-type: none"> • Volunteers who immigrated from mainland China as adults were recruited <p>Participants identified themselves as having CVD and facing or had faced making lifestyle adjustments to manage their health risk.</p> <p>Primary informants who remained highly affiliated with their own culture.</p> <p>Secondary informants who had undergone some acculturation to the larger community.</p> <p>Participant number:</p> <p>Chinese immigrants (10 men, 5 women)</p> <p>Chinese Characteristics:</p> <p>Mean age for female (74.2), male (68.3)</p>	<p>Informants were recruited into the study via the Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease database, a Chinese seniors group, numerous Chinese churches, and word of mouth.</p> <p>Semi-structured interviews Constant comparative methods</p>

Measurement tool	Main findings
The SEM framework	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • One patient with known CHD presented immediately to ED for Chest pain. • All patients moved to healthier diet with reducing salt, fat, higher glycaemic carbohydrate and sugar after diagnosis, with family support. • Most participants sought CHD health information and emotional support from family and friends who were in China, and from the media or websites in Chinese language from China, reporting the difficulties in finding culturally appropriate health education and engaging with mainstream health care resources (No indication of primary or secondary prevention, but one listed example with known heart disease). • Of 12 patient journeys, 3 attended CR. Most participants did not know the program, nor be invited to. • Most participants intentionally sought Chinese-speaking doctors. (No indication of primary or secondary prevention). • All participants preferred for Western-trained doctors and western treatment, particularly for acute conditions. Most participants used some form (Chinese herbs or acupuncture) for their general health but continued to take prescribed medication. They did not discuss TCM consumption with physicians who may consider drug interaction. (No indication of primary or secondary prevention). <p>Cultural factor:</p> <ul style="list-style-type: none"> • Language barriers: one participant changed to different cardiologists and preferred Chinese-speaking specialist. For most participants, lack of culturally and linguistically specific health information and programs resulted in difficulty in accessing mainstream healthcare, seeking health information in Chinese web/media. (No indication of primary or secondary prevention). • Family support: family made suggestions on reducing salt, fat, higher glycaemic carbohydrate, sugar within the Asian diet context, influencing all participants moving to healthier diet. Family helped participants to access medical appointments, some related to filial duty between children and grandchildren (no indication of primary or secondary prevention). All participants used family as interpreters in health setting (no indication of primary or secondary prevention). • Social network with country of origin: most participants sought health information from it. • Ethnic concordance between doctors and patients: most sought Chinese-spoken doctors. • TCM use: as a second-line treatment, western medication was more efficient. Some with mixed belief on TCM used it for general health. They did not discuss TCM consumption with physicians who may consider drug interaction. (No indication of primary or secondary prevention)
Themes: Intrapersonal factor, Interpersonal factor, Extrapersonal factor, Sociodemographic factors	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> • At early stage following CVD diagnosis, participants were decisive and resolute, quickly moving to seek health care and manage risk. They preferred Chinese physicians who understood better. • One decided to change eating habits straightforward after diagnosis. • Many adjusted medications based on their belief and symptom experience. • TCM was used for chronic disease rather than heart disease considered as an acute condition. • Some sought only western health care as believed it the best. • Some blended western approaches with TCM. One drank herbal teas regularly. • Some gave up TCM as the side effect and unaffordable price. • Many participants more often ate traditional Chinese meals and at home as believed healthier. • A few ate until 70% to 80% full to reduce food intake and manage weight. • Physically active: many walked, Tai Chi, and swam regularly. • Majority were active and diligent seeking the best healthcare and resources. • Diligent attending physician appointments and meeting multidisciplinary health providers. Most attended CR programs. <p>Cultural factor:</p> <ul style="list-style-type: none"> • Realisation that one cannot go back: participants quickly and actively sought for health care rather than dwelling on receiving their CVD diagnosis. • Believing Chinese doctors for better understanding: they preferred Chinese doctors. • Keeping peace in lives and having faith (Confucian or Christian): participants used for their heart disease management. • Beliefs in taking control on their own destiny: many participants adjusted their own medications. • TCM used for chronic disease rather than heart disease: participants sought only western medication; some blended two approaches. One drunk herbal tea to digest greasy meals. One participant gave up TCM as drug interaction. • Beliefs in home-made Chinese meals (less meat more vegetables) healthier: many preferred to eat at home frequently. • Believing that eating is not for satiety: participants controlled their meal and manage weight. • Family support: male participants were supported by wife as supervisor, organiser or cook in terms of CVD management. Female participants were supported by children. Extended family supported some participants for health behaviour changes, such as listening to family's advice. Family helped managing health care information (attending appointments, CR) as an interpreter.

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TABLE 3 (Continued)

Author/ Year/Country	Study design	Research Aim	Participants	Data collection/analysis
King-Shier, K.M, et al., 2017 Canada	A qualitative descriptive study	To develop an in-depth understanding about factors that influence cardiac medication adherence among South Asian, Chinese, and European White cardiac patients	Inclusion criteria: • Adult (>18 years) patients admitted to hospital with confirmed ACS. • Self-reported ethnicity as one of South Asian, Chinese, or European (White). • Spoke Punjabi, Tamil, Urdu, Hindi, Gujarati, Cantonese, Mandarin, or English. Participant number: 64 patients (25 South Asian, 13 Chinese, and 26 European White ACS patients) sampled Chinese Characteristics: Mean age: 63 Male (8) and female (5)	Draw on a multi-provincial, multi-ethnic cohort of ACS patients who had agreed to be contacted in the study. The interviews conducted over the telephone. Using conventional content analysis Data were collected using semi-structured interviews.

Note: rpb=Point-biserial correlation; ACS=acute coronary syndrome; ED=emergency department; CHD=coronary heart disease; CR=cardiac rehabilitation; SEM=social-ecological model; TCM=traditional Chinese medicine.

with the dietary regime recommended by health practitioners. Some patients controlled their food consumption for weight management following the traditional belief that 'eating is not for satiety' (King et al., 2007, p. 817). Considering the importance of these factors in relation to their particular cultural beliefs, most participants sought Chinese-speaking physicians who could understand them culturally as well as linguistically (Jin et al., 2020; King et al., 2007; King-Shier et al., 2017).

3.3.4 | Health belief systems

Their health belief systems shaped many Chinese immigrants' self-care behaviours for their CVD, specifically in relation to their medication adherence. In terms of their perceptions of health and disease, in one study, Chinese participants stated that they valued a healthy life more than a long life, which motivated their medication adherence (King-Shier et al., 2017). Regarding their health beliefs on medication treatment, Chinese participants trusted and took western medications as a first-line treatment, as they believed that heart disease was an acute condition which needed their prescribed cardiac medications (King-Shier et al., 2018) rather than TCM which was more often applied for general health and disease prevention (Jin et al., 2020; King et al., 2007). Some participants gave up TCM due to their beliefs that the interaction between prescribed western medications and TCM may have adverse CVD outcomes (King et al., 2007); others believed they could combine the two approaches to achieve better disease outcomes (Jin et al., 2020; King et al., 2007; King-Shier et al., 2017). However, participants commonly did not disclose their use of TCM to their doctors, which may have resulted in vulnerability to drug interactions (Jin et al., 2020).

Other cultural factors identified included having strong social networks with their country of origin, which helped Chinese participants source emotional support and health-related information (Jin et al., 2020).

4 | DISCUSSION

To the best of our knowledge, this is the first integrative review to investigate the self-care behaviours among Chinese immigrants with CVD living in western countries. Targeting Chinese first-generation immigrants, only five studies were found reporting their self-care behaviours after their CVD diagnosis and examining the impact of cultural factors. This limited number of studies indicates that this topic is under-explored and needs further research (Riegel et al., 2019). This is very important considering the large and increasing but also ageing Chinese immigrant population in western countries, and the increasing prevalence of CVD (Gong & Zhao, 2016).

One of the most frequently mentioned self-care behaviours in the included papers concerned dietary choices. Major changes of diet are always challenging in that the dietary habits of adults have been embedded in daily life over decades (Riegel et al., 2017). It was confronting for Chinese immigrants to adjust their diet in line with CVD dietary regimen recommendations in host countries. For example, Chinese participants with CVD have been reported to find it difficult to follow salt reduction recommendations (Davidson et al., 2011). Following their immigration, Chinese immigrants will have been exposed to western food and changes in their dietary practices, adopting patterns of high energy, fat and sugar consumption (Tseng et al., 2015). The longer the duration of residence, the more likely that Chinese immigrants had embedded western dietary customs into their daily life (Eh et al., 2016). In addition, compared to western standard diets, a traditional Chinese diet is significantly healthier, particularly in maintaining body mass index and lean body mass (Frida et al., 2016). However, some who retained traditional Chinese diets encountered difficulties in accessing and affording these foods in western communities. Conversely, two qualitative studies in this review highlighted that Chinese participants changed their diet straightaway after being diagnosed with CVD (Jin et al., 2020; King et al., 2007); these two studies were separated in time

Measurement tool	Main findings
The interview guide was based on Spradley's ethnographic interviewing techniques using 'grand tour' and 'mini tour' questions.	<p>Self-care behaviours:</p> <ul style="list-style-type: none"> Having variable adherence to cardiac medications, influenced by the communication with physician and motivating factors. Medication adherence was motivated by accepting it as fact of life, relieving symptoms or control disease, preventing problems, having a routine, affordable medication, and consulting with physicians on management of side effects. One occasionally added TCM to medication regime as poor controlled angina. <p>Cultural factor:</p> <ul style="list-style-type: none"> Clear, direct communication pattern with physicians; Being able to communicate one's own language and understand own 'way'. To accept it as factor of life; it facilitated medication adherence. Healthy life was more important than long life; it motivated one participant's medication adherence. TCM used for poor symptom control.

by more than 10 years, indicating this may be a sustained response in this population.

Another important element of CVD self-care behaviours focused on regular exercise. Very little is known about how Chinese immigrants with CVD manage with physical activity as only one study mentioned this. These Chinese participants presented themselves as actively engaging in exercise (King et al., 2007). This was inconsistent with a previous study, which demonstrated that Chinese participants preferred rest and not to exercise rather than participating in formal cardiac rehabilitation, believing that rest was more beneficial following their diagnosis of CVD (Davidson et al., 2011). Some at least of this difference may be explained by the different sampling settings: one study sampled people in the community, another recruited in hospital settings. Participants recruited from the community may have had longer CVD histories with better self-care skills and more confidence to undertake exercise.

In this review, Chinese immigrants reported good medication adherence for their CVD self-care, which is consistent with previous studies on medication adherence for chronic disease or condition management. For example, a study (Eh et al., 2016) of diabetes self-management showed that 80% of the Chinese immigrants with type 2 diabetes followed their medication regimen. This may be associated with belief in the benefit of western medication in achieving better disease outcomes (Jin et al., 2020; King et al., 2007; King-Shier et al., 2017, 2018). It might also be the case that higher medication adherence was predicted by higher levels of adaptation to western societies (Eh et al., 2016). Conversely, participants used TCM for general health maintenance and uncontrolled CVD symptoms by Chinese participants in the review (Jin et al., 2020; King et al., 2007), which contradicted findings of previous studies (Wang & Matthews, 2010; Zhang et al., 2018). This discrepancy warrants further investigation but indicates the importance for clinical nurses to avoid stereotyping on the use of TCM among Chinese immigrants with CVD. To improve medication adherence, it would be beneficial

for nurses to assess Chinese patients' medication history including their medication beliefs, attitudes and decision-making and provide tailored health education pertinent to cardiac medications.

Although Chinese immigrants reported actively and diligently seeking out health-related information and healthcare resources compared to other ethnic groups with more passive health seeking behaviours (Bedi et al., 2008; King et al., 2007), they sought heart-related information from their friends or family who were in China, or from Chinese websites or media (Jin et al., 2020). This is consistent with another study (Chen et al., 2010) exploring the health information seeking behaviours among Chinese Americans, where the three main sources of health information accessed were printed materials written in Chinese, Chinese family and friends, and health practitioners. This review found that some Chinese Australian immigrants failed to attend cardiac rehabilitation as they did not know about the programs (Jin et al., 2020). This is supported by the findings of a systematic review including 33 eligible papers which assessed the quality and cultural sensitivity of CVD-related health information targeting Chinese immigrants in western countries, revealing a significant lack of key information regarding heart rehabilitation in health education sources (Li et al., 2018). Development and provision of culturally and linguistically appropriate health information and education programs for Chinese immigrants is clearly warranted. Before providing standardised health education, clinical nurses could evaluate Chinese patients' level of acculturation, identifying to what degree they have adapted their daily lifestyle practices. While recommending adoption of the lifestyle regimens prescribed by the host country, nurses could also encourage Chinese immigrant to retain their healthy Chinese cultural practices (such as traditional diets), to improve their practice of self-care behaviours (Deng et al., 2013).

Unsurprisingly, one cultural factor that may have a broad impact across multiple self-care behaviours is language. Nearly one third of Chinese immigrants in Australia have poor English language

proficiency (Australian Bureau of Statistics, 2016). This poses significant barriers in interacting with health care providers and accessing health-related information or services. In this review, participants relied on family members to interpret for health-related encounters. This contravenes Australian health policy which mandates that all health organisations provide interpretation services where patients from non-English-speaking backgrounds self-identify that they require this support (New South Wales Health and Social Policy, 2017). The poor use of interpretation services could be explained by the distrust held by some people that interpreters can fully convey information from health practitioners, resulting in miscommunication (Chen et al., 2010; Feiring et al., 2020). In addition, the concept of privacy is valued in Chinese culture that people do not disclose their family or health information to others who are outside of the family (Feiring et al., 2020). Therefore, Chinese immigrants may be reluctant to request or use formal interpretation services.

Another source of broadly based cultural influence is the role of family. In the review, family support was significantly threaded throughout patients' self-care behaviours including their access to health services, lifestyle adjustments and decision-making. This finding is consistent with other studies (Daly et al., 2002; Davidson et al., 2011; Simon et al., 2018; Zhang et al., 2018), indicating that the family is a central part of Chinese cultural norms (Zhang et al., 2018). It is therefore important for clinical nurses to acknowledge and involve family members in CVD health education programs.

4.1 | Limitations

The main limitations of this integrative review are the very small number of eligible studies retrieved, and the predominant focus on Chinese immigrants to Canada (five of six included studies). In part, this was related to the specific target of the review at first-generation Chinese immigrants, which narrowed the literature search. It may also have related to the recognised limitations of computerised database searches, which have been shown to access as little as 50% of all eligible studies due to discordant search terminologies and indexing nuances (Whittemore & Knafel, 2005). For example, for this review, 'Chinese immigrants' could be referred to as Chinese Canadian, Chinese or Chinese Australian depending on the countries of origin. Additionally, some of the included papers did not distinguish secondary from primary prevention behaviours among Chinese participants, which may have resulted in interpretation bias.

5 | CONCLUSIONS

The most prominent finding of this review was the scarcity of literature on the self-care behaviours and related cultural considerations among Chinese first-generation immigrants living with CVD in western countries. Given the large and growing size and ageing of this population internationally, this indicates the priority need for nurses to undertake further research to support service development in this

area. It is important for clinical nurses to avoid stereotyping and acknowledge that Chinese immigrants may often opt to actively manage their CVD, including via lifestyle modifications, high adherence to western medication regimes and proactive health information seeking. Moreover, it would be beneficial to involve family members into nurse-initiated health education programs, given the importance of their contribution to behavioural decisions for patients. The development of culturally and linguistically sensitive health resources and education programs targeting Chinese immigrants with known CVD is urgently needed to improve their self-care knowledge and promote their self-care skills.

6 | RELEVANCE TO CLINICAL PRACTICE

Self-care is the cornerstone for patients living with cardiovascular disease, but is challenging as it is intertwined with a range of personal, social and cultural factors. It is important that clinical nurses avoid cultural stereotyping of Chinese immigrant patients and acknowledge the importance of nursing assessment prior to providing them the heart health education. The development of culturally and linguistically sensitive health resources and education programs is urgently needed to improve Chinese immigrants' knowledge and skills of CVD self-care. Acute and community nurses who are experienced in caring for Chinese patients play an essential role to help improve nursing cultural sensitivity and practices and develop the culturally acceptable health education programs.

CONFLICTS OF INTERESTS

None.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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Appendix 2: PRISMA 2020 checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 3-4
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 4
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 4-7
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 27 and Supplementary
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 4,20 and Supplementary
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 4, 5, 27
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 6,7
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 22-26, supplementary
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Not applicable
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 5,7

Section and Topic	Item #	Checklist item	Location where item is reported
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Not applicable
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Not applicable
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Not applicable
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 6-7, 22-26
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 6-7 Supplementary
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 6-7, supplementary
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Not applicable
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Not applicable
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 5-7, 21
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 6, 27
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Not applicable
Study characteristics	17	Cite each included study and present its characteristics.	Page 7-8, 22-26
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Page 7, 15
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Page 22-26

Section and Topic	Item #	Checklist item	Location where item is reported
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Page 15, 21-26, Supplementary
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Not applicable
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Not applicable
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Not applicable
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Not applicable
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Page 6-7 Supplementary
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 12-15
	23b	Discuss any limitations of the evidence included in the review.	Page 15
	23c	Discuss any limitations of the review processes used.	Page 15
	23d	Discuss implications of the results for practice, policy, and future research.	Page 16
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 1,4
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 4
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Not applicable
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 16
Competing interests	26	Declare any competing interests of review authors.	Page 16
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Page 16, 20-27

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: <http://www.prisma-statement.org/>

Appendix 3: Literature search strategies (last access 17/10/2024)

Concept 1	Concept 2	Concept 3	Database	Filters	Result
chin* W/4 (immigrat* OR ethnici* OR cald OR migra*)	cardio* OR cardia* OR "heart failure" OR heart* OR coronary* OR angina* OR myocard* OR isch?em* OR stroke OR strokes OR poststroke OR post-stroke OR cerebrovasc* OR "cerebral vascular" OR brain* OR infarct*	experienc* OR prevent* OR manag* OR self-management OR behav* OR adjust* OR rehab* OR care* OR self-care OR diet* OR exercis* OR "physical activit*" OR medication OR health-seeking OR care- seeking OR seek* OR respon* OR lifestyle* OR life-style*	Scopus	Key words, title, abstract 2000-2024 Article and review English and Chinese	548
chin* NEAR/4 (immigrat* OR ethnici* OR cald OR migra*)	Same above	Same above	ProQuest health & medicine	Anywhere except full-text Peer-reviewed 2000-2024 English	369
chin* adj4 (immigrat* OR ethnici* OR cald OR migra*)	Same above	Same above	Medline(Ovid)	No limitation set 2000-2024	457
chin* adj4 (immigrat* OR ethnici* OR cald OR migra*)	Same above	Same above	Embase (Ovid)	No limitation set 2000-2024	812
chin* adj4 (immigrat* OR ethnici* OR cald OR migra*)	Same above	Same above	AMED(Ovid)	No limitation set 2000-2024	6
chin* N4 (immigrat* OR ethnici* OR cald OR migra*)	Same above	Same above	psycINFO	All-text 2000-2024 Peer Reviewed Journal	194
chin* N4 (immigrat* OR ethnici* OR cald OR migra*)	Same above	Same above	CINAHL	All-text 2000-2024 Peer Reviewed	287
					Exported 2673 to Endnote

Appendix 4: Concept matrix one

Reference	Self-care behaviours among Chinese immigrants with CVD in Western countries				
	Diet Adjustment	Physical Activity	Medication Adherence		Health Seeking Behaviours
			Western medication	Traditional Chinese medication	Seeking health information
Quantitative studies					
Fredericks 2012					
Fredericks 2012					
King-shier et al., 2018			<ul style="list-style-type: none"> • There was high cardiac medication adherence among Chinese immigrants. • Medication adherence was significantly related to medication affordability, challenges in remembering to take medication, doubt about the need to take medication, and making own decision on which medications to take. 		<ul style="list-style-type: none"> • 93% of Chinese participants continued to consult with doctors on their cardiac medications, although the percentage was lower than White (100%) and South Asian (94.9%).
King-shier et al., 2019					<ul style="list-style-type: none"> • The mean time to ED responding to acute coronary syndrome was unacceptable long (5.53 to 7.41 hours), and no significant difference in ethnic variation in time to ED presentation.

Reference	Self-care behaviours among Chinese immigrants with CVD in Western countries					
	Diet Adjustment	Physical Activity	Medication Adherence		Health Seeking Behaviours	
			Western medication	Traditional Chinese medication	Seeking health information	Seeking health care
Shi et al., 2024	Overall, the average coronary artery disease self-care management was inadequate, with a self-management score of 38.25	The average daily consumption of fruit and vegetables was 2.86 servings, far lower than the recommended amount.	<ul style="list-style-type: none"> The average of moderate-intensity exercise per week was 89 mins, and a small part of the patients (17.19%) achieved the recommendation. The daily step count was 4848, this was lower than the suggested 7000-10000 steps. 			
Qualitative studies						
Jin et al., 2020	<ul style="list-style-type: none"> All patients moved to a healthier diet with reduced salt, fat, higher glycaemic carbohydrate and sugar after diagnosis, with family support. 		<ul style="list-style-type: none"> All participants preferred Western treatment to TCM. (No indication of primary or secondary prevention) 	<ul style="list-style-type: none"> Most participants used some form (Chinese herbs or acupuncture) for their general health but continued to take prescribed medication. They did not discuss TCM 	<ul style="list-style-type: none"> Most participants sought CHD health information and emotional support from family and friends who were in China, and from the media or websites in the Chinese language from China, reporting the difficulties in finding culturally 	<ul style="list-style-type: none"> One patient with known CHD presented immediately to ED for Chest pain. Of 12 patient journeys, 3 attended CR. Most participants did not know the program, nor were invited to. Most participants Intentionally sought Chinese-speaking doctors.

Reference	Self-care behaviours among Chinese immigrants with CVD in Western countries					
	Diet Adjustment	Physical Activity	Medication Adherence		Health Seeking Behaviours	
			Western medication	Traditional Chinese medication	Seeking health information	Seeking health care
King et al., 2007	<ul style="list-style-type: none"> •One decided to change eating habits straightforwardly after diagnosis. •Many participants more often ate traditional Chinese meals and at home as believed healthier. •A few ate until 70% to 80% full to reduce food intake and manage weight. 	<ul style="list-style-type: none"> •Physically active: many walked, Tai Chi, and swam regularly. 	<ul style="list-style-type: none"> •Many adjusted medications based on their belief and symptom experience. 	<p>consumption with physicians who may consider drug interaction. (No indication of primary or secondary prevention)</p> <p>(No indication of primary or secondary prevention, but one listed example with known heart disease)</p>	<p>appropriate health education and engaging with mainstream health care resources. (No indication of primary or secondary prevention, but one listed example with known heart disease)</p>	<p>(No indication of primary or secondary prevention)</p> <ul style="list-style-type: none"> •All participants preferred for Western-trained doctors, particularly for acute conditions
				<ul style="list-style-type: none"> •TCM was used for chronic disease rather than heart disease • Some considered an acute condition. • Some blended Western approaches with TCM. One drank herbal teas regularly. • Some gave up TCM as a side-effect and 	<ul style="list-style-type: none"> •Majority were active and diligent seeking the best healthcare and resources. 	<ul style="list-style-type: none"> •At early stage following CVD diagnosis, participants were decisive and resolute, quickly moving to seek health care and manage risk. • They preferred Chinese physicians who understood better. • Some sought only Western health care as believed it the best. •Diligent attending physician appointments and meeting multidisciplinary

Reference	Self-care behaviours among Chinese immigrants with CVD in Western countries				
	Diet Adjustment	Physical Activity	Medication Adherence		Health Seeking Behaviours
			Western medication	Traditional Chinese medication	
King-Shier et al., 2017			<ul style="list-style-type: none"> Having variable adherence to cardiac medications, influenced by communication with physicians and motivating factors. Medication adherence was motivated by accepting it as a fact of life, relieving symptoms or controlling disease, preventing problems, having a routine, affordable medication, and consulting with physicians on the management of side effects. 	unaffordable price. <ul style="list-style-type: none"> One occasionally added TCM to the medication regime as poorly controlled angina. 	health providers. Most attended CR programs.

Note: ED: emergency department; CHD: coronary heart disease; TCM: traditional Chinese medicine; CR: cardiac rehabilitation;

Appendix 5: Concept matrix two

Reference	Cultural factors related to CVD self-care behaviours				
	language barrier	Cultural beliefs	Health belief system	Family role	Other cultural factors
Quantitative studies					
Fredericks 2012	None				
King-shier et al., 2018		<ul style="list-style-type: none"> Self-decision on which medication to take was significantly associated with medication adherence (P=0.029). 	<ul style="list-style-type: none"> Participants who believe the need to take the prescribed medication tended to take medication consistently (p<0.001). 		
King-shier et al., 2019					<ul style="list-style-type: none"> Ethnicity is related to the time presenting to ED, although the difference is little (no indication of P-value).
Qualitative studies					
Jin et al., 2020	<ul style="list-style-type: none"> One participant changed to different cardiologists and preferred Chinese-speaking specialists. For most participants, a lack of culturally and linguistically specific health information and programs resulted in difficulty in 	<ul style="list-style-type: none"> Ethnic concordance between doctors and patients: most sought Chinese-spoken doctors. 	<ul style="list-style-type: none"> TCM use: as a second-line treatment, western medication was more efficient. Some with mixed belief on TCM used it for general health. They did not discuss TCM consumption with physicians who may consider drug interaction. (No indication of primary or secondary prevention). 	<ul style="list-style-type: none"> Family made suggestions on reducing salt, fat, higher glycaemic carbohydrates, and sugar within the Asian diet context, influencing all 	<ul style="list-style-type: none"> Social network with country of origin: most participants sought health information from it.

Reference	Cultural factors related to CVD self-care behaviours				
	language barrier	Cultural beliefs	Health belief system	Family role	Other cultural factors
accessing mainstream healthcare and seeking health information in Chinese web/media. (No indication of primary or secondary prevention).				<ul style="list-style-type: none"> participants moving to a healthier diet. Family helped participants to access medical appointments, some related to filial duty between children and grandchildren. (no indication of primary or secondary prevention). All participants used family as interpreters in health settings (no indication of primary or secondary prevention). 	
King et al., 2007	<ul style="list-style-type: none"> Believing Chinese doctors for better understanding: they preferred Chinese doctors Realization that one cannot go back: participants quickly and actively sought health care rather than dwelling on 	<ul style="list-style-type: none"> TCM used for chronic disease rather than heart disease: participants sought only western medication; some blended two approaches. One drunk herbal tea to digest greasy meals. One participant gave up TCM as drug interaction. 		<ul style="list-style-type: none"> Male participants were supported by wife as supervisor, organizer or cook in terms of CVD management. Female participants were supported by children. 	

Reference	Cultural factors related to CVD self-care behaviours				
	language barrier	Cultural beliefs	Health belief system	Family role	Other cultural factors
King-Shier et al., 2017		<p>receiving their CVD diagnosis.</p> <ul style="list-style-type: none"> • Keeping peace in life and having faith (Confucian or Christian): participants used for their heart disease management. • Beliefs in taking control of their own destiny: many participants adjusted their own medications. • Beliefs in home-made Chinese meals (less meat more vegetables) healthier: many preferred to eat at home frequently. • Believing that eating is not for satiety: participants controlled their meals and managed weight. • Clear, direct communication pattern with physicians; Being able to communicate one's own 	<ul style="list-style-type: none"> • TCM used for poor symptom control. 	<ul style="list-style-type: none"> • Extended family supported some participants for health behaviour changes, such as listening to family's advice. • Family helped managing health care information (attending appointments, CR) as an interpreter. 	

Reference	Cultural factors related to CVD self-care behaviours				
	language barrier	Cultural beliefs	Health belief system	Family role	Other cultural factors
	language and understand own "way". • To accept it as a fact of life: it facilitated medication adherence.	• A healthy life was more important than a long life: it motivated one participant's medication adherence			

Note: CVD=cardiovascular disease, TCM=traditional Chinese medicine, ED=emergency department, CR=cardiac rehabilitation.

Appendix 6: Recruitment flyer

The flyer features the UTS logo and 'UNIVERSITY OF TECHNOLOGY SYDNEY' text. It includes a red wavy graphic at the bottom and a small grey box in the bottom right corner.

We need your stories:
Sharing your experience with heart disease

What is this research about?

This research seeks to understand how Chinese immigrants in Australia take care of their heart disease.

Why participate?

- Contribute valuable information to researchers and health practitioners to develop heart health service.
- Help yourself and others improve the knowledge and skills on taking care of your heart health, decreasing disease burden.

Who can participate?

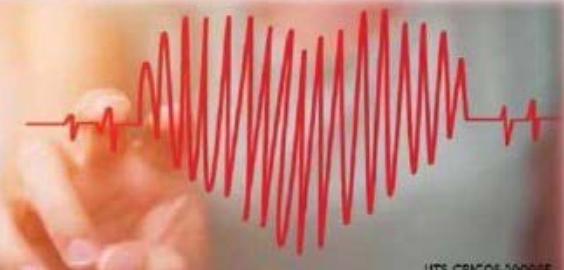
- Born in Mainland China, Hong Kong, Macao or Taiwan
- Australian permanent resident or citizen
- Diagnosed with heart disease or stroke
- Speak Mandarin or English.

How to be involved?

You are invited to take part in either an *interview* or *survey*.

Contact Cristina for more information:

Phone: [redacted] Email: @student.uts.edu.au WeChat: [redacted]



UTS CRICOS 00028F

我们想听您的故事： 分享您照护心脏健康的经验

这项研究目的是什么？

这项研究是为了了解在澳华人是如何照护自己的心脏健康。

为什么要参与这项研究？

- 为科研和医护人员提供宝贵的信息，利于发展针对澳洲华人的心脏健康服务项目。
- 帮助您和他人增长心脏健康的知识，以及提高自我照护能力，从而减轻心脏疾病负担。



谁可以参与这项研究？

您需满足以下四个条件：

- 出生于中国，包括香港，台湾，澳门地区。
- 目前是澳洲公民或持永久居住权。
- 被确诊患有心血管病，如：冠心病，心梗发作，心脏衰竭，脑中风等。
- 会说普通话或是英文。



这项研究将如何进行？

我们诚邀您通过一对一会谈，或是填写问卷方式参与这项研究。

如果您或家人朋友愿意参与这项研究，想了解更多信息
请与科研员 **Cristina** 联系：

电话：_____ 邮箱：@student.uts.edu.au 微信：_____

Appendix 7: Participant information sheet



PARTICIPANT INFORMATION SHEET

The impact of acculturation on self-care behaviours among Chinese Australians living with cardiovascular disease

WHO IS CONDUCTING THIS RESEARCH?

My name is *Ling (Cristina) ZENG*. I am a Registered Nurse and doctoral student at the School of Nursing and Midwifery, UTS. My supervisors are *Professor Lin Perry and Dr Luna XU*.

WHAT IS THE RESEARCH ABOUT?

The purpose of this research is to understand your experiences living with heart problems by answering three main questions. These are,

1. After your heart disease or stroke diagnosis, what do you do to take care of your heart or stroke related health?
2. Following your move to Australia, what changes have you made in the way you live to adapt to the culture in Australia?
3. How do these changes affect how you take care of your heart health?

WHY HAVE I BEEN INVITED?

You have been invited to take part in this study, because:

- You were born in Mainland China, Hong Kong, Macao or Taiwan, and have moved to Australia as a permanent resident or citizen
- You have been diagnosed with heart disease or stroke
- You are able to speak Mandarin or English.



FUNDING

No funding has been received for this project.

WHAT DOES MY PARTICIPATION INVOLVE?

You are invited to take part in the interview. It will be up to around 60 minutes, and be conducted on phone. The phone interview will be audio-recorded and typed up later under your agreement.

The interview will include three parts: |

Part one: I will ask you some background information;

Part two: I will ask you about your health and illnesses;

Part three: I will hear your stories about living with heart disease and your experiences of how this has been affected by living in Australia.

ARE THERE ANY RISKS/INCONVENIENCE?

Yes, there are some potential risks and inconvenience:

- You might feel embarrassed about being interviewed, and concerned about what other people might think about your responses. There are no right or wrong answers to any of these questions and there will be no judgement or judgemental attitudes about your experiences or opinions.
- You might be asked some questions that will result in you recalling details of your past heart disease experiences and/ or details of your previous life before moving to Australia, which could potentially evoke some emotions or even distress.
- If you experience any distress, you have the right to stop the interview, either as a pause or to end it completely, at any time. The researcher will offer you contact details and suggest you may access one of the reliable support services that are freely available to you, such as

Lifeline and Transcultural Mental Health, all of which can provide mental health support in the language you prefer. Free services can be contacted via these websites:

Lifeline: <https://www.lifeline.org.au/language-support/>

Transcultural Mental Health: <https://www.dhi.health.nsw.gov.au/transcultural-mental-health-centre>

Alternatively, the researcher will offer a debrief session for you, or offer to contact your general practitioner, with your consent.

DO I HAVE TO TAKE PART IN THIS RESEARCH PROJECT?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part. If you decide not to participate, or later decide to withdraw from the study, it will not affect your relationship with the researchers or the University of Technology Sydney.

WHAT IF I WITHDRAW FROM THIS RESEARCH PROJECT?

If you wish to withdraw from the study once it has started, you can do so at any time without having to give a reason, by contacting the researcher *Ling (Cristina) ZENG*. If you withdraw from the study, your interview record or questionnaire responses will be destroyed if you request this before all identifiers have been removed.

WHAT WILL HAPPEN TO INFORMATION ABOUT ME?

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. All this information will be treated confidentially. Your information will only be used for the purpose of this research project and it will only be disclosed with your permission, except as required by law.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your permission.

In accordance with relevant Australian and/or NSW Privacy laws, you have the right to request access to the information about you that is collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please inform the research team member named at the end of this document if you would like to access your information.

The results of this research may also be shared through open access (public) scientific databases, including internet databases. This will enable other researchers to use the data to investigate other important research questions. Results shared in this way will always be de-identified by removing all personal information (e.g. name, address, date of birth etc.).

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about the research that you think I or my supervisor can help you with, please feel free to contact me on email address: [REDACTED] or Phone: [REDACTED] You will be given a copy of this form to keep.

NOTE:

This study has been approved in line with the University of Technology Sydney Human Research Ethics Committee [UTS HREC] guidelines. If you have any concerns or complaints about any aspect of the conduct of this research, please contact the Ethics Secretariat on ph.: +61 2 9514 2478 or email: Research.Ethics@uts.edu.au, and quote the UTS HREC reference number ETH21-6096. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

CONSENT FORM

The impact of acculturation on self-care behaviours among Chinese Australians living with cardiovascular disease

I _____ agree to participate in the research project being conducted by *Ling (Cristina) ZENG, doctoral student at University of Technology Sydney (UTS), phone* _____

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney.

I understand that I will be given a signed copy of this document to keep.

I am aware that I can contact *Ling (Cristina) ZENG* if I have any concerns about the research.

_____/_____/_____
Name and Signature [participant] Date

_____/_____/_____
Name and Signature [researcher or delegate] Date

知情同意书

文化适应对患有心血管疾病的澳洲华人自我照护行为的影响

谁在开展这项研究？

我是曾玲（Cristina），一名澳洲注册护士，同时也是悉尼科技大学护理和助产学院的护理博士生。由我的导师佩里·林教授（Professor Lin Perry）和许晓悦博士后（Dr Luna Xu）指导我完成这项博士科研课题。

这项研究的目的是什么？

这项研究的目的是：通过回答以下三个问题从而了解您照护自己心脏健康的经历。

1. 在确诊患有心脏病或是中风后，您日常是怎样照顾自己心脏健康的？
2. 在您移居澳洲后，为了适应澳洲文化，您的生活方式发生了哪些改变？
3. 这些变化是如何影响您照顾自己心脏健康的？

为什么我被邀请参与这项研究？

邀请您参与这项研究，是因为：

- 您出生于中国大陆，包括香港，台湾，澳门地区，目前是澳洲公民或持永久居住权。
- 您之前被确诊患有心血管病，如：冠心病，心梗发作，心脏衰竭，脑中风等。
- 您会说普通话或是英文。

科研项目基金

该科研项目无基金资助。

这项研究是如何进行的？

在这项研究里，我们邀请您参与一对一的电话采访，采访将持续大约最多 60 分钟。在您的同意之下，这过程会被录音，之后录音资料会转写为书面文字。

电话采访是以聊天的形式进行，内容包含三个部分：

- 第一部分：询问您个人基本信息。
- 第二部分：询问您身体健康情况。
- 第三部分：听您分享自己照护心脏健康的经历。而生活在澳洲，又是如何影响您这些经历。

参与这项研究会有风险或是不方便吗？

是的，参与这项研究会或可能会有潜在的风险或是不方便，具体如下：

- 在接受会谈时，你可能会感觉不自在，窘迫感，担心他人（如科研人员）对您的谈话进行评价。您所回答的问题都没有正确或是错误的答案，只是为了解您的想法和个人经历。因此，科研人员不会做任何评判或是持评判态度。
- 您可能会回答一些问题，而这些问题会让您回忆：过去心脏发作（或中风）时的细节，或是移居澳洲前的生活。这个过程可能会影响您的情绪或是让您感到痛苦难受。
- 如果您因此感到任何痛苦，您有权在任何时间暂停或是终止会谈。科研人员的联系方式将提供给您，和建议您向专业可靠且免费的心理援助中心寻求帮助，比如生命热线（Lifeline）和跨文化心理健康中心（NSW Transcultural Mental Health Centre），这些心理健康中心提供免费的中文心理健康支持服务，网址如下：

生命热线（Lifeline）：<https://www.lifeline.org.au/language-support/>

跨文化心理健康中心（NSW Transcultural Mental Health Centre）：

<https://www.dhi.health.nsw.gov.au/transcultural-mental-health-centre-tmhc/resources/in-your-language/simplified-chinese>

或者，科研人员会提供倾诉机会，让您可以述说自己的痛苦，缓解自己的情绪；或是在获得您的批准后，联系您的家庭医生，让您得到进一步的心理健康支持服务。

我必须参与这项研究吗？

您可自主决定是否参与该项研究。如果您拒绝参与，或想中途退出这项研究，您的这项决定不会对您和科研人员或是悉尼科技大学的关系造成任何影响。

我可以中途停止参与这项研究吗？

如果您想要中途退出这项研究，您可以在任何时候告知科研人员您退出的决定，并且不需要提供理由。如果您中途退出这项研究，根据您的要求，这期间，您的会谈记录或是填写的问卷（包含您个人信息）将会被销毁。

关于我的个人信息将会被如何处理？

签署这份同意书代表着您同意科研团队收集并且使用与您有关的个人信息。您的个人信息将会做保密处理。这些个人资料将只会用于这项研究，并且只有经过您的允许才可以向他人公开，除法律规定以外。

这项研究结果预期将会出版并且/或是公开发表在各种学术论坛，但未经您允许，任何能识别您身份的信息都不会出现在被公开发表的研究报告里。

依据相关的澳大利亚和新南威尔士隐私法规，您有权要求获取由科研组所收集并保存到的与您有关的信息。您也有权要求任何您不认同的信息得到纠正。如果您想要获取您的信息，请告知科研人员，并在这份文件结尾时提出您的这项要求。

这项研究结果也可能被分享到可开放获取（公共）的科学数据库，包括互联网数据库。这是为了让其他的科研人员能使用这些数据去研究其他重要的科研问题。以这种方式共享的研究数据会去除所有可识别您个人身份的信息（如名字，住址，出生日等），用编码替代这些去除的信息，这样您就不会被认出。

如有疑问或是抱怨该怎么办？

如果您对这项研究存在任何疑虑，并且认为科研人员可以帮助您解答这些疑问，请您拨打
电话: [REDACTED] 或是邮件: [REDACTED] 联系科研人员（曾玲）。您将
会保存这份知情同意书的副本。

注意:

这项研究已经获得悉尼科技大学人类研究伦理委员会的批准。如果您对这项研究存在任何
疑虑或是不满，请您拨打电话: +61 2 9514 2478 或是写邮件: Research.Ethics@uts.edu.au
联系伦理委员会秘书部，并且指明所参与研究的编号 ETH21-6096。您提出的任何问题都
将保密处理，所调查的结果会通知您。

参与研究知情同意书
文化适应对患有心血管疾病的澳洲华人自我照护行为的影响

我， _____，同意参与这项由悉尼科技大学博士生曾玲（Cristina），联系电话：
_____，进行的研究。

我已经阅读了这份参与者知情书，或已有人用我可以听懂的语言为我朗读。

我理解知情书里所解释的该项研究目的，程序以及可能涉及到的风险。

我有机会提出问题，并且我的问题得到了满意的答复。

我自愿参与该项研究，并且明白我可以在任何时候退出该项研究，而这将不会对我和科研人员或是悉尼科技大学的关系造成任何影响。

我明白，我将获得这份已签名的文件副本，用以保存。

我明白，如果有任何关于该研究的问题，我都可以联系科研人员曾玲（Cristina）。

_____ / _____
参与者姓名以及签名 日期

_____ / _____
科研员或代理人姓名以及签名 日期

Appendix 8: Interview guide

-----Section 1-----

“Now, I would like to ask you a couple of basic questions about you”

1. How would you like me to call you: Miss, Mr, Mrs...other?

2. How old are you?

3. Where were you born?

Mainland China Hong Kong Taiwan Macao elsewhere

4. Which region/city you lived most before moving to Australia:

5. Your age at migration (years)?

6. How long have you lived in Australia (years): _____ (since got PR) or time lived here

7. What language do you speak at home:

English Mandarin Both Other

8. How well do you speak the English language:

Not at all Not well Well Very well

9. What is your highest level of education?

10. How about your marital status:

11. Who lives with you at home? (Including grandchildren)

12. What is your current employment status?

13. Do you have a private health insurance:

Yes No

-----Section 2-----

Now, I would like to know more about your health condition.

13. Apart from heart problems, do you have any other health issues?

14. What is your heart problem? Can you briefly tell me what happened?

- Time of the initial heart diagnosis
- Place of the initial heart diagnosis
- The reason brought to heart diagnosis (health screening or cardiac symptoms)The diagnostic tests
- The risk factors of heart disease, mention one by one

- Treatment plan (medications)
- Feeling about the initial heart diagnosis
- Any heart or stroke events or hospital admissions since your cardiac diagnosis

-----Section 3-----

15. Apart from medication, what advice did you get to manage your disease from health professionals?

16. (Yes) regarding the health advice, what did you do at home? (What changes did you make in daily life?)

(No) In the early days following the diagnosis, what did you do to take care of your heart health?

- How did you take your medication?
 - Take it regularly? Missing doses? Stop it?
 - Western medicine / TCM? Traditional Chinese patent medicine /supplement
 - Monitor/response to side effects?
- Seeking healthcare services?
 - Doctor (GP, cardio specialist, allied health?/ ethical background)
 - Reasons for health services (follow-up, medication, symptoms...flu vaccination)
 - Communication (barriers?)
 - How did you find and learn the heart health materials?
- Any changes in lifestyles?
 - Diet (food choices, cooking, three meals/day, who cooks), smoking/alcohol, social meals
 - Exercise (type, frequency, with anyone? Noticed any symptoms)
 - Weight?
 - Cope stress?
 - Sleep? Social activities?
- Symptom monitor and response? (since the initial diagnosis, have you had any cardiac symptoms)
 - How did you monitor? (BP, blood sugar, cholesterol, INR)
 - What symptoms make you relate them to your heart problem?
 - What did you do with the heart symptoms?
 - (optional) How did you prevent the heart event? Triggers?

17. How did the diagnosis impact your family? What did they do with your heart health?

Supervision: Medication? Lifestyles? Seeking healthcare? Health information?

- Monitor: symptoms?
- Assistant: meals/ seek healthcare?

18. Nowadays, what do you do for your heart health? Can you tell me about any changes compared to your past experiences taking care of CVD? Why do you make these changes?

- Medication? Lifestyles? Seeking healthcare? Health information? Symptom monitor? Your feeling?/family? Attitudes to the diagnosis
- The impact of COVID-19 pandemic

19. After moving to Australia, have you noticed any cultural differences? What changes have you made in your daily life? (Or thinking of a typical day when living in China, and compare to the day in Australia? Any difference? Any changes?)

- Daily life
 - Language and media use,
 - Social network,
 - Food preference,
 - Exercise
 - Healthcare
- Cultural values
 - Family relationship (marriage, with children)
 - Life values/ attitudes
 - Health attitudes/TCM/Western medicine
- Cultural identifications...
- Healthcare systems/ experience of seeking medical care
- Any changes to your family?

20. How do these changes affect your way of managing your heart health? Does it make any difference on your way to managing your heart health? If so how?

21. Is there anything else about how you look after your heart health that you would like to tell me?

Appendix 9: Survey questionnaire English and Chinese version

Doctors and Nurses want to better understand your heart health

Doctors and Nurses in Australia really want to know how you take care of your heart health after moving to Australia and what challenges you may meet regarding language and cultural differences. Thus, they could provide better heart health service for Chinese community. By helping them, you can improve the knowledge and skills on managing your own heart health. Would you like to share your heart experience with us?

If you: 1. born in Mainland China, Hong Kong, Macao or Taiwan; 2. live in Australia at least 6 months; 3. have heart disease or stroke; 4. speak or read in Chinese or English, we invite you to fill a survey to help us know your heart health experience.

(If you previously took part in this study by a phone interview, you do not need to complete this questionnaire again.)

This is a brief survey, and it ask questions about: 1. You and your heart condition; 2. What changes you made to adapt the life and culture in Australia; 3. How you take care of your heart or stroke problem.

For more details, you can click the attachment link.

By completing this survey, you are consenting to participate in this study. We are excited to listen to your heart experience!

Part 1: General questions about you and your heart health

Please select the choice or multiple choices that best describe your current situation.

1. Your age: _____ years

2. Are you: Female Male Other

3. How long have you lived in Australia? (Years): _____

4. How well are you able to speak or read English?

Not at all A little Good Very well

5. What is your highest level of education? Completed primary school

Completed middle school

Completed high school

Completed a vocational certificate /diploma

Completed a bachelor degree

Completed a higher degree (Masters or Doctoral degree)

6. Who lives with you at home?

No one, I live alone

Partner or spouse

Child/children

Adult child/children (include daughter/son-in-law)

Parent(s)

Other, please describe relationship _____

7. What is your current employment status?

Retired

Unemployed

Full-time employed (at least 30hrs/week)

Part-time employed

In voluntary employment without pay

8. Do you have a Medicare card?

Yes No

9. Do you have a private health insurance?

Yes No

10. Have you been told you have any of these heart (or stroke) problems? (Mark all that apply)

- Coronary artery disease or blood blockage
- Heart attack or myocardial infarction for stent, bypass or thrombosis treatment
- Heart failure or chronic heart failure
- Angina or heart pain Stroke, including 'TIA' or mini-stroke
- Other heart problem, please state _____

11. In what month and year were you first told you have this heart (or stroke) problem?

(Approximately, if you are not sure)

12. Where were you when you were first told you have this heart (or stroke) problem?

- China
- Australia
- elsewhere, please state _____

13. Do you take any Traditional Chinese Medication (herbal or patent medication) for managing your heart (or stroke) problem, for example, quick-acting rescue pills?

No Yes, please list from memory: _____

Part 2: Cultural lifestyle changes you may have experienced

Section A: The questions in this section ask about your past history as well as more recent experiences, and how you see yourself. Please choose the one answer to each question which best describes you.

1. What language can you speak?

- Chinese only (for example, Cantonese, Mandarin, Hakka, Hokkien, etc.)
- Mostly Chinese, some English
- Chinese and English about equally well (bilingual)
- Mostly English, some Chinese
- Only English

2. What language do you prefer?

- Chinese only (for example, Cantonese, Mandarin, Hakka, Hokkien, etc.)
- Mostly Chinese, some English
- Chinese and English about equally well (bilingual)
- Mostly English, some Chinese
- Only English

3. There are many different ways in which people think of themselves. Which ONE of the following most closely describes how you view yourself?

- I consider myself basically a Chinese person. Even though I live and work in Australia, I still view myself basically as a Chinese person.
- I consider myself as a Chinese-Australian, although deep down I always know I am a Chinese.
- I consider myself as a Chinese-Australian, I have both Chinese and Australian characteristics and I view myself as a blend of both.
- I consider myself as a Chinese-Australian, although deep down I view myself as an Australian first.
- I consider myself basically an Australian. Even though I have a Chinese background and

characteristics, I still view myself basically as an Australian.

4. Which identification does (did) your mother use? (Or which ONE of the following most closely describes how you think your mother viewed herself?)

- Oriental
- Asian
- Chinese
- Chinese-Australian
- Australian

5. Which identification does (did) your father use? (Or which ONE of the following most closely describes how you think your father viewed himself?)

- Oriental
- Asian
- Chinese
- Chinese-Australian
- Australian

6. What was the ethnic origin of the friends and peers you had, as a child up to age 6?

- Almost exclusively Chinese, Chinese-Australians, Asians
- Mostly Chinese, Chinese-Australians, Asians
- About equally Chinese groups and Australian groups
- Mostly Australians or other non-Chinese ethnic groups
- Almost exclusively Australians or other non-Chinese ethnic groups

7. What was the ethnic origin of the friends and peers you had, as a child from 6 to 18?

- Almost exclusively Chinese, Chinese-Australians, Asians

- Mostly Chinese, Chinese-Australians, Asians
- About equally Chinese groups and Australian groups
- Mostly Australians or other non-Chinese ethnic groups
- Almost exclusively Australians or other non-Chinese ethnic groups

8. Whom do you now associate with in the community?

- Almost exclusively Chinese, Chinese-Australians, Asians
- Mostly Chinese, Chinese-Australians, Asians
- About equally Chinese groups and Australian groups
- Mostly Australians or other non-Chinese ethnic groups
- Almost exclusively Australians or other non-Chinese ethnic groups

9. If you could pick, whom would you prefer to associate with in the community?

- Almost exclusively Chinese, Chinese-Australians, Asians
- Mostly Chinese, Chinese-Australians, Asians
- About equally Chinese groups and Australian groups
- Mostly Australians or other non-Chinese ethnic groups
- Almost exclusively Australians or other non-Chinese ethnic groups

10. What is your music preference?

- Chinese-language songs.
- Chinese-language songs mostly.
- Equally Chinese /English-language songs.
- Mostly English-language songs
- English only

11. What is your movie preference?

- Chinese-language movies only.
- Chinese-language movies mostly.
- Equally Chinese/English-language movie.

- Mostly English-language movies only
- English-language movies only

12. Where were you raised? (Or where did you live as a child and adolescent?)

- In Asia only
- Mostly in Asia, some time in Australia
- Equally in Asia and Australia
- Mostly in Australia, some time in Asia
- In Australia only

13. What contact have you had with Asia?

- Raised one year or more in Asia
- Lived for less than one year in Asia
- Never resided in Asia, occasional visits only
- Never resided in Asia, occasional communications (letters, phone calls, emails, etc.) with people in Asia
- No exposure or communications with people in Asia

14. What is your food preference at home?

- Exclusively Chinese food
- Mostly Chinese food and some Western food
- About equally Chinese and Western (non-Chinese) food
- Mostly Western (non-Chinese) food
- Exclusively Western (non-Chinese) food

15. What is your food preference in restaurants?

- Exclusively Chinese food
- Mostly Chinese food and some Western food
- About equally Chinese and Western (non-Chinese) food

- Mostly Western (non-Chinese) food
- Exclusively Western (non-Chinese) food

16. Do you

- Read only Chinese language?
- Read Chinese language better than English?
- Read both Chinese and English equally well?
- Read English better than Chinese language?
- Read only English?

17. Do you

- Write only Chinese language?
- Write Chinese language better than English?
- Write both Chinese and English equally well?
- Write English better than Chinese language?
- Write only English?

18. If you consider yourself a member of the Chinese group (Asian, Chinese, Chinese-Australian, etc., whatever term you prefer), how much pride do you have in this group?

- Extremely proud
- Moderately proud
- Little pride
- No pride but do not feel negative toward group
- No pride but do feel negative toward group

19. How would you rate yourself?

- Very Chinese
- Mostly Chinese
- Bicultural

- Mostly Westernized
- Very Westernized

20. Do you participate in Chinese occasions, holidays, traditions, etc.?

- Nearly all
- Most of them
- Some of them
- A few of them
- None at all

For question 21-24, please select the number which best describes you

21. Rate yourself on how much you believe in Chinese or Asian values (e.g. about marriage, families, education, work.):

1	2	3	4	5
(Do not believe)				(Strongly believe)

22. Rate yourself on how much you believe in Western values:

1	2	3	4	5
(Do not believe)				(Strongly believe in Western values)

23. Rate yourself on how well you fit when with other Chinese of the same ethnicity:

1	2	3	4	5
(Do not fit)				(Fit very well)

24. Rate yourself on how well you fit when with other Australians who are non-Chinese (Westerners):

1	2	3	4	5
(Do not fit)				(Fit very well)

25. How do you identify yourself?

- Oriental
- Asian
- Chinese
- Chinese-Australian
- Australian

Section B: The questions in this section ask how sure you are that you can do various things. Choose the one answer which best describes you.

How sure are you that you can:

	Not at all sure		Very sure	
	1	2	3	4
1. Have family closeness and interpersonal warmth in your daily life				
2. Maintain close ties and relationships in your family	1	2	3	4
3. Deal with family expectations and obligations	1	2	3	4
4. Schedule an appointment with a doctor	1	2	3	4
5. Receive the health care that you need	1	2	3	4
6. Communicate your health concerns with your doctor	1	2	3	4
7. Understand your doctor's medical advice and health recommendations	1	2	3	4
8. Deal with unfamiliar Australian foods	1	2	3	4
9. Deal with a new lifestyle in Australia	1	2	3	4
10. Cope with situations in which everyone only speaks English	1	2	3	4

Section C: Choose the one answer which best describes your situation.

	Strongly disagree		Neither disagree nor agree		Strongly agree
1. Compared with Western medicine, Traditional Chinese Medicine is more effective for long-standing diseases	1	2	3	4	5
2. Traditional Chinese Medicine treats the cause of illness	1	2	3	4	5
3. Compared with Western medicine, Traditional Chinese Medicine has fewer side effects	1	2	3	4	5
4. Compared with Western medicine, Traditional Chinese Medicine causes less digestive side effects	1	2	3	4	5
5. Traditional Chinese Medicine can cure diseases	1	2	3	4	5
6. Traditional Chinese Medicine can promote health	1	2	3	4	5
7. Traditional Chinese Medicine has a restorative effect which can promote health over time	1	2	3	4	5
8. Traditional Chinese Medicine can improve one's constitution	1	2	3	4	5

Part 3: how you take care of your heart health

Think about how you have been feeling in the last month as you complete these items. Choose the one answer which best describes your situation.

Section A: Listed below are common instructions given to persons with heart disease.

How routinely do you do the following?

	Never or rarely	Some- times	Always or daily	
1. Keep appointments with your healthcare provider?	1	2	3	4
2. Take aspirin or other blood thinner?	1	2	3	4
3. Do something to relieve stress (e.g. medication, yoga, music)?	1	2	3	4
4. Do physical activity (e.g. take a brisk walk, use the stairs)?	1	2	3	4
5. Take prescribed medicines without missing a dose?	1	2	3	4
6. Ask for low fat items when eating out or visiting others?	1	2	3	4
7. Try to avoid getting sick (e.g. get a flu shot, wash your hands)?	1	2	3	4
8. Eat fruits and vegetables?	1	2	3	4
9. Avoid cigarettes and/or smokers?	1	2	3	4
10. Make sure to get good rest (e.g. sleep well at night, nap during the day)?	1	2	3	4
11. Avoid triggers that may worsen your heart problem (e.g. physical exertion, cold weather, tiredness)?	1	2	3	4

Section B: Listed below are some common things that people with coronary heart disease monitor. Choose the one answer which best describes your situation.

How often do you do the following?

	Never or rarely	Some- times	Always or daily

1. Monitor or check your condition?	1	2	3	4	5
2. Pay attention to changes in how you feel?	1	2	3	4	5
3. Check your blood pressure?	1	2	3	4	5
4. Monitor whether you tire more than usual doing normal activities?	1	2	3	4	5
5. Monitor for medication side-effects?	1	2	3	4	5
6. Monitor for symptoms?	1	2	3	4	5
7. Monitor your weight?	1	2	3	4	5

SYMPTOM RECOGNITION:

Many people with heart disease have symptoms of their heart problem, such as chest pain, chest pressure, burning, heaviness, shortness of breath, and fatigue. Choose the one answer which best describes your situation.

The last time you had a symptom ...

	Have not had symptoms	I did not recognize the symptom	Not Quickly	Somewhat Quickly	Very Quickly
8. How quickly did you <u>recognize</u> it as a heart symptom?	N/A	0	1	2	3

Section C: Listed below are actions that people with heart disease use when they have a symptom of their disease. Choose the one answer which best describes your situation.

If you have a symptom, how likely are you to try one of these actions?

	Not Likely	Somewhat Likely	Very Likely

1. Change your activity level (slow down, rest)	1	2	3	4	5
2. Take an aspirin	1	2	3	4	5
3. Take a medicine to make the symptom decrease or go away	1	2	3	4	5
4. Call your healthcare provider for guidance	1	2	3	4	5
5. Tell your healthcare provider about the symptom at the next office visit	1	2	3	4	5

Think of an action or a treatment you used the last time you had a symptom of heart disease. Choose the one answer which best describes your situation.

	I did not do anything	Not Sure	Somewhat Sure	Very Sure
6. Did the treatment you used make you feel better?	0	1	2	3

Section D: Choose the one answer which best describes your situation.

1. How confident are you that you have the knowledge you need to take care of your heart (or stroke) problem?

1

2

3

4

5

(Not confident at all)

(Very confident)

2. Where do you search for heart health information to get the knowledge you need for managing your heart (or stroke) problem? Choose as many as answers that apply to your situation.

I never search for heart health information

I search Chinese websites (e.g. Baidu, WeChat)

- I search Western websites (e.g. Google, YouTube)
- I ask my Chinese friend or family in Australia
- I ask my friends or family in China
- I read books, magazines or newspapers brought from China
- I attend Chinese community centres (e.g. health talk session)
- I read resources distributed from Australian healthcare
- Others, please specify it _____

3. Is there anything else about how you look after your heart health (or stroke) that you would like to tell me?

Thank you for completing the questionnaire. This information will be used to inform and help health services be more closely linked to what the Chinese population in Australia wants or prefers.

医生和护士想更好地了解您心脏健康

澳大利亚的医生和护士非常想知道，您移居澳洲后是如何照护自己的心脏健康，而语言文化差异是否给您在照护心脏问题上带来不便或困难。这些宝贵的信息可以帮助他们为澳洲华人提供更好的心脏健康服务。帮助他们会利于您增长心脏健康方面的知识和提高自我照护的能力。您愿意与我们分享您心脏健康的经历吗？

如果您：**1.**出生于中国大陆,香港,台湾或澳门地区; **2.**在澳洲生活了至少6个月; **3.**被确诊患有心血管疾病,如:冠心病(支架或者搭桥手术),心绞痛,心梗发作,心脏衰竭,脑中风; **4.**会说或阅读中文或者英文;

我们邀请您填写一份问卷来帮助我们了解您的心脏健康经历。

(如果您之前有通过电话采访方式参与这项研究,您无需再做这份问卷)

这份简单的问卷,主要是想了解:**1**您和您心脏健康的基本情况;**2**您在适应中澳文化差异过程中,生活中经历了的变化;**3**您是如何照护自己的心脏或中风问题。

想要了解更多相关信息,您可联系科研员曾玲 **0468736843**。

填写这份问卷表示您是同意参与这项科研的. 我们非常期待聆听您的心脏健康经历!

第1部分: 了解您的基本情况和心脏健康情况。

请选择最能反映您真实情况的选项。

1. 您的年龄: _____ 岁

2. 您是:

女性 男性 其他

3. 您在澳洲居住了多长时间? (年) _____

4. 您认为自己的英语说得或阅读能力如何?

不会

一点点

还可以

很好

5. 您的最高学历是什么?

小学毕业

初中毕业

高中毕业

职业技术/大专毕业

本科毕业

本科以上学历 (硕士或博士毕业)

没接受过文化教育

6. 目前, 您和谁住在一起?

没有, 我一个人生活

伴侣或是配偶

未成年子女

成年子女 (包括儿媳或女婿)

父母 (们)

其他, 请详述说明你们的关系_____

7. 您目前就业情况如何?

退休

失业

全职工作 (一周至少 30 小时)

兼职工作

无薪志愿者

8. 您是否有澳洲医保卡?

有 无

9. 您是否有私人医疗保险?

有 无

10. 医生有告诉过您患有以下哪种心脏 (或者中风) 问题? (可多选)

- 心血管疾病 或是 冠心病 或者 血管堵塞 或者 心脏供血不足
- 突发心脏病 或是 心肌梗 或者 心脏支架手术, 搭桥手术或者溶栓治疗
- 心脏衰竭 或是 慢性心脏衰竭
- 心绞痛 或是 心口痛
- 中风, 包括短暂性脑缺血发作, 脑梗塞或是轻微中风
- 其他心脏问题, 请详述_____

11. 在何年何月您得知自己患有以上心脏 (或中风) 问题的?

(如果您不确定, 写下大概时间)

12. 您在哪被确诊患有以上心脏 (或中风) 问题的?

中国 澳洲 其他地方, 请详述_____

13. 您有服用治疗心脏 (或中风) 问题的中药 (中草药或者中成药) 吗? 比如, 服用速效救心丸缓解心绞痛。

没有 有, 请详述: _____

第 2 部分: 了解您为适应澳洲文化, 生活中所经历的变化

第 2-1 部分：下面的问题是了解一些您之前和最近期的日常生活情况。从生活方式，思想观念和归属感/身份认同方面，了解您是如何适应澳洲文化。医生和护士想知道这些变化是否会影响您照顾自己心脏健康。请选择最能反映您真实情况的一个答案。

1. 您能说哪种语言？

- 只能说华语（如广东话，普通话，客家话，福建话等）。
- 主要说华语，会说一些英语。
- 华语和英语都同样流利（双语）。
- 主要说英语，会说一些华语。
- 只能说英语。

2. 您情愿说哪种语言？（觉得比较自然）

- 只能说华语（如广东话，普通话，客家话，福建话等）。
- 主要说华语，会说一些英语。
- 华语和英语都同样流利（双语）。
- 主要说英语，会说一些华语。
- 只能说英语。

3. 每个人对自己的身份都有不同的想法。以下哪一项最能描述您对自己的看法？

- 我认为我基本上是个中国人，虽然我在澳洲生活和工作，我仍然视自己为中国人。
- 我认为我是华裔澳洲人，虽然在我心深处我总认为我是个中国人。
- 我认为我是华裔澳洲人，我拥有中国人和澳洲人两方面的特性，我认为我是个中澳混合体。
- 我认为我是华裔澳洲人，虽然在我心深处我已视自己为澳洲人。
- 我认为我基本上是个澳洲人，虽然我有华裔背景和特征，我仍然视自己为澳洲人。

4. 您的母亲认为她的身份是（或者以下哪个选项最能描述，您认为您母亲看待她自己的身份）：

- 东方人
- 亚洲人
- 中国人
- 华裔澳洲人
- 澳洲人

5. 您的父亲认为他的身份是（或者以下哪个选项最能描述，您认为您父亲看待他自己的身份）：

- 东方人
- 亚洲人
- 中国人
- 华裔澳洲人
- 澳洲人

6. 在六岁以前，您的朋友和玩伴是属于哪一种族的？

- 几乎全部都是华人，华裔澳洲人或亚裔人士。
- 大部分是华人，华裔澳洲人或亚裔人士。
- 大约一半是华人，一半是澳洲人。
- 大部分是澳洲人或其他非华裔人士。
- 几乎全部都是澳洲人或其他非华裔人士。

7. 在六至十八岁期间，您的朋友和同伴是属于哪一种族的？

- 几乎全部都是华人，华裔澳洲人或亚裔人士。
- 大部分是华人，华裔澳洲人或亚裔人士。

- 大约一半是华人，一半是澳洲人。
- 大部分是澳洲人或其他非华裔人士。
- 几乎全部都是澳洲人或其他非华裔人士。

8. 现在，您跟社区内哪些人交往呢？

- 几乎全部都是华人，华裔澳洲人或亚裔人士。
- 大部分是华人，华裔澳洲人或亚裔人士。
- 大约一半是华人，一半是澳洲人。
- 大部分是澳洲人或其他非华裔人士。
- 几乎全部都是澳洲人或其他非华裔人士。

9. 如果可以选择的话，您情愿（或是觉得比较自然）跟社区内哪些人交往呢？

- 几乎全部都是华人，华裔澳洲人或亚裔人士。
- 大部分是华人，华裔澳洲人或亚裔人士。
- 大约一半是华人，一半是澳洲人。
- 大部分是澳洲人或其他非华裔人士。
- 几乎全部都是澳洲人或其他非华裔人士。

10. 您喜欢的音乐是：

- 只喜欢华语歌曲。
- 以华语歌曲为主。
- 华语及英语歌曲同样喜欢。
- 以英语歌曲为主。
- 只喜欢英语歌曲。

11. 您喜欢的电影是：

- 只喜欢华语电影。
- 以华语电影为主。

- 华语及英语电影同样喜欢。
- 以英语电影为主。
- 只喜欢英语电影。

12. 您在哪里长大？（或者您童年和青少年时期在哪居住？）

- 只在亚洲。
- 大部分在亚洲，小部分在澳洲。
- 亚洲和澳洲各占一半。
- 大部分在澳洲，小部分在亚洲。
- 全部在澳洲。

13. 您接触亚洲及其文化是通过：

- 在亚洲长大/生活一年以上。
- 在亚洲生活少于一年。
- 从没有在亚洲居住，间中前往亚洲探访。
- 从没有在亚洲居住，间中跟生活在亚洲的朋友通讯（如书信，电话，电邮等）
- 从来没有跟住在亚洲的人接触或通讯。

14. 您在家里喜欢吃：

- 全部是中国食品。
- 大部分是中国食品，少部分是西方食品。
- 中国食品和西方食品各半。
- 大部分是西方（非中国）食品。
- 全部是西方（非中国）食品。

15. 您上酒楼或是餐厅喜欢吃：

- 全部是中国食品。
- 大部分是中国食品，少部分是西方食品。

- 中国食品和西方食品各半。
- 大部分是西方（非中国）食品。
- 全部是西方（非中国）食品。

16. 关于阅读，您：

- 只会阅读中文。
- 阅读中文较阅读英文为佳。
- 中英文阅读能力同样好。
- 阅读英文较阅读中文为佳。
- 只会阅读英文。

17. 关于书写，您：

- 只会书写中文。
- 书写中文较书写英文为佳。
- 中英文书写能力同样好。
- 书写英文较书写中文为佳。
- 只会书写英文。

18. 如果您视自己为华裔人士（无论您称自己为亚洲人，中国人，华裔澳洲人等），您对这身份：

- 感觉非常自豪。
- 感觉中等程度的自豪。
- 感觉少许自豪。
- 不觉自豪但也没有负面感觉。
- 不觉自豪却存有负面感觉。

19. 您怎么评估自己？

- 非常中国化。
 - 比较中国化。
 - 中西文化并重(双文化)。
 - 比较西化。
 - 非常西化。

20. 您有参与任何中国传统活动，节日庆祝吗？

- 差不多所有活动。
 - 大部分活动。
 - 有些活动。
 - 少数活动。
 - 完全没有。

对于问题21-24，请根据您的答案圈定一个数字。

21. 试评估您对中国或亚洲价值观（例如婚姻，家庭，教育，工作等）的接受程度？

1 2 3 4 5

(完全不接受) (强烈认同)

22. 试评估您对西方价值观的接受程度？

1 2 3 4 5

(完全不接受) (强烈认同)

23. 试评估您跟其他华裔人士融洽共处的程度。

1 2 3 4 5

(不能共处) (非常融洽)

24. 试评估您跟其他非华裔澳洲人（西方人）融洽共处的程度。

1 2 3 4 5

(不能共处) (非常融洽)

25. 您认为您自己的身份是：

- 东方人
- 亚洲人
- 中国人
- 华裔澳洲人
- 澳洲人

第 2-2 部分：下面列出的问题是想知道，你有多确定可以做到以下这些你想做的事情。请选择最能反映您真实情况的一个答案（请圈定一个数字）。

您有多确定您可以：

	一点也 不确定	非常 确定
1. 在日常生活中，拥有亲密和温暖的家庭关系	1	2
2. 与家人保持亲密的关系	1	2
3. 处理好家庭的期望和家庭职责	1	2
4. 预约医生	1	2
5. 得到你所需要的医疗服务	1	2
6. 与医生沟通你的健康问题	1	2
7. 听懂医生的医嘱和健康指导	1	2
8. 适应不熟悉的澳大利亚食物	1	2
9. 应对在澳大利亚新的生活方式	1	2
10. 应付语言障碍（需要说英文）这种情况	1	2

第2-3部分：请选择最能反映您真实想法的一个答案（请圈定一个数字）。

	强烈 反对	不反对也 不同意		非常 同意	
1. 在治疗慢性疾病方面，传统中医比西医更有效。	1	2	3	4	5
2. 传统中医在于治疗病根。	1	2	3	4	5
3. 与西医相比，传统中医的副作用比较小。	1	2	3	4	5
4. 与西医相比，传统中医对消化道造成的副作用比较小。	1	2	3	4	5
5. 传统中医可以治好疾病。	1	2	3	4	5
6. 传统中医可用于保健，促进健康。	1	2	3	4	5
7. 传统中医具有恢复身体健康的功效，可以长时间的促进身体健康。	1	2	3	4	5
8. 传统中医可以改善人的体质。	1	2	3	4	5

第3部分：您对自己心脏健康的日常照护

在完成这些条目时，想想过去一个月您的感受。

第3-1部分：下面列出了对冠心病患者/中风的常规指导。请选择最能反映您真实想法的一个答案（请圈定一个数字）。您日常是如何做以下事情的？

	从不或 很少	有时	总是或 每天	
1.按照与医务人员的预约就诊？	1	2	3	4
2.服用阿司匹林或其他血液稀释剂？	1	2	3	4
3.做一些缓解压力的事情（如药物、瑜伽、音乐）？	1	2	3	4

4. 做体育活动（如健步走，爬楼梯）？	1	2	3	4	5
5. 遵医嘱服药，无漏服情况？	1	2	3	4	5
6. 在外就餐或拜访他人时要求低脂肪含量的食物？	1	2	3	4	5
7. 尽量避免生病（例如打流感疫苗，洗手）？	1	2	3	4	5
8. 吃水果和蔬菜？	1	2	3	4	5
9. 不吸烟和/或避开吸烟者？	1	2	3	4	5
10. 保证充足的休息？（如，好的睡眠，午休习惯）	1	2	3	4	5
11. 避免引发心脏不适的诱因（如体力劳动，寒冷天气，过度疲劳）	1	2	3	4	5

第3-2部分:下面列出了对冠心病/中风患者的一些常规监测。请选择最能反映您真实想法的一个答案（请圈定一个数字）。

您做如下事情的频率如何？

	从不或 很少	有时			总是或 每天
1. 监测您的身体状况？	1	2	3	4	5
2. 关注您感觉的变化？	1	2	3	4	5
3. 监测您的血压？	1	2	3	4	5
4. 监测您在做正常活动时是否比平时更疲劳？	1	2	3	4	5
5. 监测药物的副作用？	1	2	3	4	5
6. 监测症状？	1	2	3	4	5
7. 监测您的体重？	1	2	3	4	5

症状识别:

很多冠心病患者有胸痛，胸闷不适，灼烧感，沉重感，气短和疲乏等症状，或者中风症状，您上次出现症状时…（请圈定一个数字）。

	没有症状	我没有意识到症状	不是很快	较快	非常快
8. 您多快意识到它是冠心病/中风的症状?	不适用	0	1	2	3

第3-3部分:下面列出了冠心病/中风发作时所采用的做法.请选择最能反映您真实想法的一个答案 (请圈定一个数字) 。

如果您出现症状时, 尝试这些做法的可能性有多大?

	不太可能	有可能	非常可能
1.改变活动水平 (放慢下来, 休息)	1	2	3
2.服用阿司匹林	1	2	3
3.服用缓解或消除症状的药物	1	2	3
4.给您的医务人员打电话寻求指导	1	2	3
5.下次就诊时将症状告知您的医务人员	1	2	3

想想您上次出现冠心病/中风症状时您采用的治疗。请选择最能反映您真实想法的一个答案 (请圈定一个数字) 。

	我什么都没做	不确定	有些确定	非常确定
6.您采用的治疗让您感觉好些了吗?	0	1	2	3

第3-4部分:请选择最能反映您真实想法的一个答案 (请圈定一个数字) 。

1. 对于您所具备的照护心脏（或中风）健康的所需知识，您有多自信？

1

2

3

4

5

(一点也不自信)

(非常自信)

2. 您是通过哪些渠道来了解心脏（或中风）健康方面的知识？(可多选)

- 我从不主动查询心脏相关资料
- 我查询中国网站（如百度，微信）
- 我查询国外网站（如谷歌，YouTube）
- 我询问在澳洲的华人朋友或者家人
- 我询问在中国的朋友或者家人
- 我阅读从中国带来的相关书籍，期刊
- 我参加澳洲华人社区中心活动（如健康讲座）
- 我阅读澳洲医疗系统发出的健康指导资料
- 其他，请详述_____

关于在照护心脏健康（或中风）问题上，您还有没有什么要补充的？

谢谢您完成这份调查问卷。这些信息将会用于帮助医务人员制定适合澳洲华人的
心脏健康服务项目。

Appendix 10: Acculturation scale copyrights

Copyright of SL-ASIA scale

Psychosocial Measures for Asian Americans: Tools for Practice and Research
www.columbia.edu/cu/ssw/projects/pmap

Name of Measure: The Suinn-Lew Asian Self Identity Acculturation (Suinn, Ahuna, & Khoo, 1992)

Purpose of Measure: To level of acculturation of Asian populations

Author(s) of Abstract:

Richard M. Suinn, Ph.D., ABPP
Emeritus Professor
Dept. of Psychology, Colorado State University

Dear Colleague:

You have my permission to use the SL-ASIA scale. It is duplicated below and on my web site: <http://home.earthlink.net/~colosuinn/index.html>. Please note that if you feel your sample is one that requires reading a translated version, this could mean that your sample is very restricted to a first generation. If so, then by definition you would not have enough subjects who represent the various levels of acculturation (low to middle to high). If so, then this restricted range will prevent you from testing any hypothesis regarding how "level of acculturation" or acculturation differences has effects.

Also note the usual principles regarding use of standardized tests: if you revise any part of the test - order of questions, wording of answers, etc. - then it may be questionable whether the test still is valid. Certainly, the question can be raised about whether the same norms can be used to interpret the results. If you choose to do such a revision, you should discuss the matter with a colleague who is a methodologist, or your advisor if you are a student.

After some thoughts about acculturation and its measurement, I have added questions 22-26 to the original 21 item scale. These questions can serve to further classify your research participants in ways that use current theorizing that acculturation is not linear, uni-dimensional but multi-dimensional and orthogonal. These new items were developed based on writings of those who felt that a linear, uni-dimensional scale was insufficient. Hence, we wrote some added items as a potential separate way of classifying the subjects...if the original scale did not turn out predictive. We have not obtained any validity/reliability info on these added items, but hope that users of the added items will share their results with me.

The following are suggestions for use of either the original 21 item scale or the newer items:

USING THE ORIGINAL 21 ITEMS:

In scoring these 21 items, add up each answer for each question on the scale, then obtain a total value by summing across the answers for all 21 items. A final acculturation score is calculated by then dividing the total value by 21; hence a score can range from 1.00 (low acculturation) to 5.00 (high acculturation). Because of the nature of the multiple choice content, it is possible to view low scores as reflective of high Asian identification, with high scores reflecting high Western identification. In other words, a low score reflects low acculturation, while a high score reflects high acculturation.

Another way of interpreting the total score relies upon recent discussions pointing out that there are actual three dimensions in acculturation. Thus, a person may be

entirely assimilated into the new culture in all ways, for example, the Asian becomes completely identified as a part of the dominant Western society. This would be called "Western identified" or "assimilated" and would be represented in a SL-ASIA score of "5". Another person may retain identify with their ethnic heritage and refuse attempts to become integrated within the Western society. This would be called "Asian-identified" and would be represented in a SL-ASIA score of "1". Finally, there is now recognition that a person may be capable of assuming the best of two worlds, with denial to neither. The term used here is "bicultural" and would be reflected in a SL-ASIA score of "3". In addition to such an analysis of the total score, it is also possible to examine question number 20, which presents subjects with the opportunity to identify themselves as "very Asian," "bicultural," or "very Anglicized."

USING THE NEW ITEMS (Questions: 22/23, 24/25, OR 26)

1) Classifying by examining the answers to #22 and #23 together:

- a) if #22 has "4" or "5" (high Asian values) and #23 has either "1", "2", or "3" (low Western values), then classify this person as Asian-identified; b) if #23 has "4" or "5" (high Western) and #22 has either "1", "2", or "3" (low Asian), then classify this person as Western-identified; c) if #22 has "4" or "5" (high Asian) and #23 has "4" or "5" (high Western), then classify this person as "bicultural"; d) if the subject has checked "1", or "2" for BOTH 22 and 23 (low Asian and low Western values), this person is denying any identification and may be alienated from both cultures.

Using these questions, you can re-examine your data with these items being used to re-classify or re-categorize your sample. For convenience call the scoring of the questions #22 and 23 the "SL-ASIA values score". Because the categorizing method uses a different set of variables than classification using the original 21 item SL-ASIA scores, you might obtain different results.

2) Classifying by examining the answers to #24 and #25 together:

- a) if #24 has "4" or "5" (high Asian fit) and #25 has either "1", "2", or "3", (low Western fit) then classify this person as Asian-identified;
- b) if #25 has "4" or "5" (high Western fit) and #24 has either "1", "2", or "3" (low Asian fit), then classify this person as Western-identified
- c) if #24 has "4" or "5" (high Asian fit) and #25 has "4" or "5" (high Western fit), then classify this person as "bicultural";
- d) if the subject has checked "1", or "2" for BOTH 24 and 25 (low Asian and low Western fit) this person is denying any identification and may be alienated from both cultures.

As with use of items #22 and #23, this procedure involves categorizing and is not on a continuum. For convenience, call the scoring of items #24 and 25 the "SL-ASIA behavioral competencies score". The assumption is that "fitting" reflects the presence of behaviors that enables such a fit.

TABLE 1
 SCORING OF QUES. 22/23 OR 24/25

		Answers to Questions 22 or 24				
		1	2	3	4	5
Q. 23 or 25	1	N	N	(A)	A	A
	2	N	N	(A)	A	A
	3	(W)	(W)	(B)	A	A
	4	W	W	W	B	B
	5	W	W	W	B	B

A=asian identified

B=bicultural

W=western

N=neither (Alienated)

The scoring in parentheses are open to question. Either they can be used to score, or the alternative is to eliminate these persons from the analyses

3) Classifying by using item #26 is straightforward, since each possible answer is a category in itself:

- a) answer 1 defines the person as Asian self-identified,
- b) answer 2 is Western self-identified,
- c) answers 3, 4, 5 are all bicultural-identified, but with sub-categories:
 - (1) answer 3 is "Bicultural, Asian self-identity"
 - (2) answer 4 is "Bicultural, Western self-identity"
 - (3) answer 5 is "Bicultural, bicultural self-identity"

Item #26 could therefore be scored on a continuum: Asian identified, Bicultural Asian, Bicultural/bicultural identity, Bicultural Western, and Western identified. In using item #26, for convenience call the scoring the "SL-ASIA self-identity score".

4) Item #26 might also be scored by another procedure, based on a very small pilot study we just completed:

- a) answers using either 1 OR 3 would classify the person as "Asian identified"
- b) answers using either 2 OR 4 would classify the person as "Western identified"
- c) answer using 5 classifies the person as "bicultural"

THEORETICAL COMMENT:

Let me suggest the following definitions (which is a simplified approach, but consistent with definitions used by some other writers):

Acculturation is a process that can occur when two or more cultures interact together. There are several possible outcomes of this process, including assimilation, whereby a host culture absorbs the immigrant culture, or multiculturalism, whereby both cultures exist side-by-side. On an individual level, exposure to another culture can lead a person to resisting change in his/her values and behavioral competencies, adopting the host culture's values and behavioral skills and styles as a replacement for his/her parent

culture's values/behaviors, acquiring host culture values/behaviors while retaining parent culture values/behaviors with situational reliance determining which values/behaviors are in effect at different times.

Identity involves the individual's self-perception or subjective statement of his/her cultural character. By this definition, it is the individual who declares his/her "identity". It is therefore possible that a person's self-definition might be in contrast to the actual behavioral competencies or values possessed or expressed by the individual. For instance, an individual might fully possess the behavioral competencies necessary to "fit" and be accepted into a Western environment (job, school, residence, etc.), yet privately retain the identity of being "Asian".

Although the original SL-ASIA scale offers one method for measuring acculturation, these additional items (questions #22-26) might measure the topic in other ways. First, the items are not stated as uni-dimensional, linear but orthogonal. Secondly, research results might lead to different results using the different ways of classifying the participants:

- using the SL-ASIA 21 item scale, or
- using the SL-ASIA values scores to classify acculturation based upon values, or
- using the SL-ASIA behavioral competency scores to classify acculturation based upon behavioral skills that permit "fitting in", or
- using item #26 as a self-statement of identity, including three possible levels of bicultural, or
- using various scores in combination, e.g., high Asian values/high Asian behavioral competencies versus high Asian values/low Asian behavioral competencies; or high Asian values/high Asian self-identity versus high Asian values/Bicultural, bicultural self-identity, etc.

It is conceivable that new information might surface when the data are analyzed using one classification, but not another classification or scoring method. For example, it may turn out that identification based on self-identity is associated with different outcomes, than identification based on behavioral competencies or values. Further, each scoring method might lead to sub-categories. Consider the differences between a person who strongly believes in Western values and is able to strongly fit into a non-Asian group but who views him/herself as "Bicultural, Asian self-identity" versus a person who also strongly believes in Western values, is a strong fit into non-Asian environments but who views him/herself as "Bicultural, Western self-identity".

It is also possible that values scores and self-identity might represent a more stable prediction across diverse outcomes or settings, while predictions based on the behavioral competency scores might be situationally based. For instance, possibly behavioral competency scores can predict performance ratings at work, but not predict choice of spouse or sex role behaviors at home or on dates.

Not only am I encouraging research to study the differences when acculturation or identity is determined with the different methods of measurement or scoring, but I would also encourage the distinction between measuring performance versus satisfaction. Consider the following:

- An Asian-American client with strong Asian values and fits well into either Asian or Western environments (possesses Western behavioral competencies) and who self-

identifies as an Asian-American ("Bicultural, bicultural self-identity") is assigned to a non-Asian counselor who encourages self-disclosure. Our analysis would predict that although initial progress might be slow, this client will be able to work with the non-Asian counselor. This is based upon the client's possessing the Western behavioral competencies. Satisfaction ratings of counseling by the client, however, will probably be low.

- An Asian-American client with strong Asian values who fits poorly into Western environments and who self-identifies as Asian is assigned to a non-Asian counselor who encourages self-disclosure. Our prediction would be for an early termination. This is due to the conflict of values plus the inability of the client to engage in the Western behaviors required by the counselor.

Clearly, other factors can be expected to affect the ability to use acculturation or identity as a predictive variable. Free-choice versus restricted-choice is one dimension. With increased levels of restriction (e.g., savings too low to permit purchasing a home near a city with an Asian population), acculturation is less influential as a predictive variable. With increased free-choice (e.g., numbers of eligible Asian and non-Asian dating partners), acculturation and self-identity might be more useful in prediction of behaviors. Consider:

- An Asian-American student needs electives for graduation. This student has high Asian values, possesses Western and Asian behavioral competencies, and self-identifies as "Bicultural, bicultural self-identity". This student could enroll in either an Asian-American Studies or Western Civilization elective and be satisfied with either set of courses.
- An Asian-American student needs electives. This student has high Asian values, possesses Western and Asian behavioral competencies, and self-identifies as Asian. This student would be more likely to select an Asian History course than a History of the Western World, if both were available as electives.
- An Asian-American student needs electives. This student has high Western values, possesses Western and Asian behavioral competencies, and identifies as "Bicultural, bicultural self-identity". This student would be more likely to select an Asian-American Studies elective than an Asian History or History of the Western World elective.

These views are theoretical predictions or hypotheses, based upon current beliefs about multi-dimensionality and orthogonality of acculturation. I am hopeful that those of you who are using the SL-ASIA will adopt the 26 item approach (especially if your research predictions are not upheld when using only the 21 item scores), and the various ways of analyzing your data. Please inform me of your results!

Sincerely,

Richard M. Suinn, Ph.D.
Professor of Psychology

References: Suinn, R. M., Ahuna, C., Khoo, G. (1992). The Suinn-Lew Asian Self-Identity Acculturation Scale: Concurrent and factorial validation. *Educational & Psychological Measurement*, 52(4), 1041-1046.

**SUINN-LEW ASIAN SELF-IDENTITY ACCULTURATION SCALE
(SL-ASIA)**

INSTRUCTIONS: The questions which follow are for the purpose of collecting information about your historical background as well as more recent behaviors which may be related to your cultural identity. Choose the one answer which best describes you.

1. What language can you speak?
 1. Asian only (for example, Chinese, Japanese, Korean, Vietnamese, etc.)
 2. Mostly Asian, some English
 3. Asian and English about equally well (bilingual)
 4. Mostly English, some Asian
 5. Only English
2. What language do you prefer?
 1. Asian only (for example, Chinese, Japanese, Korean, Vietnamese, etc.)
 2. Mostly Asian, some English
 3. Asian and English about equally well (bilingual)
 4. Mostly English, some Asian
 5. Only English
3. How do you identify yourself?
 1. Oriental
 2. Asian
 3. Asian-American
 4. Chinese-American, Japanese-American, Korean-American, etc.
 5. American
4. Which identification does (did) your mother use?
 1. Oriental
 2. Asian
 3. Asian-American
 4. Chinese-American, Japanese-American, Korean-American, etc.
 5. American
5. Which identification does (did) your father use?
 1. Oriental
 2. Asian
 3. Asian-American
 4. Chinese-American, Japanese-American, Korean-American, etc.
 5. American
6. What was the ethnic origin of the friends and peers you had, as a child up to age 6?
 1. Almost exclusively Asians, Asian-Americans, Orientals
 2. Mostly Asians, Asian-Americans, Orientals
 3. About equally Asian groups and Anglo groups
 4. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups

7. What was the ethnic origin of the friends and peers you had, as a child from 6 to 18?
 1. Almost exclusively Asians, Asian-Americans, Orientals
 2. Mostly Asians, Asian-Americans, Orientals
 3. About equally Asian groups and Anglo groups
 4. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
8. Whom do you now associate with in the community?
 1. Almost exclusively Asians, Asian-Americans, Orientals
 2. Mostly Asians, Asian-Americans, Orientals
 3. About equally Asian groups and Anglo groups
 4. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
9. If you could pick, whom would you prefer to associate with in the community?
 1. Almost exclusively Asians, Asian-Americans, Orientals
 2. Mostly Asians, Asian-Americans, Orientals
 3. About equally Asian groups and Anglo groups
 4. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 5. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
10. What is your music preference?
 1. Only Asian music (for example, Chinese, Japanese, Korean, Vietnamese, etc.)
 2. Mostly Asian
 3. Equally Asian and English
 4. Mostly English
 5. English only
11. What is your movie preference?
 1. Asian-language movies only
 2. Asian-language movies mostly
 3. Equally Asian/English English-language movies
 4. Mostly English-language movies only
 5. English-language movies only
12. What generation are you? (circle the generation that best applies to you:)
 - 1 1st Generation = I was born in Asia or country other than U.S.
 - 2 2nd Generation = I was born in U.S., either parent was born in Asia or country other than U.S.
 - 3 3rd Generation = I was born in U.S., both parents were born in U.S., and all grandparents born in Asia or country other than U.S.
 - 4 4th Generation = I was born in U.S., both parents were born in U.S., and at least one grandparent born in Asia or country other than U.S. and one grandparent born in U.S.
 - 5 5th Generation = I was born in U.S., both parents were born in U.S., and all grandparents also born in U.S.

- 6 Don't know what generation best fits since I lack some information.
13. Where were you raised?
1. In Asia only
2. Mostly in Asia, some in U.S.
3. Equally in Asia and U.S.
4. Mostly in U.S., some in Asia
5. In U.S. only
14. What contact have you had with Asia?
1. Raised one year or more in Asia
2. Lived for less than one year in Asia
3. Occasional visits to Asia
4. Occasional communications (letters, phone calls, etc.) with people in Asia
5. No exposure or communications with people in Asia
15. What is your food preference at home?
1. Exclusively Asian food
2. Mostly Asian food, some American
3. About equally Asian and American
4. Mostly American food
5. Exclusively American food
16. What is your food preference in restaurants?
1. Exclusively Asian food
2. Mostly Asian food, some American
3. About equally Asian and American
4. Mostly American food
5. Exclusively American food
17. Do you
1. Read only an Asian language?
2. Read an Asian language better than English?
3. Read both Asian and English equally well?
4. Read English better than an Asian language?
5. Read only English?
18. Do you
1. Write only an Asian language?
2. Write an Asian language better than English?
3. Write both Asian and English equally well?
4. Write English better than an Asian language?
5. Write only English?
19. If you consider yourself a member of the Asian group (Oriental, Asian, Asian-American, Chinese-American, etc., whatever term you prefer), how much pride do you have in this group?
1. Extremely proud
2. Moderately proud
3. Little pride
4. No pride but do not feel negative toward group
5. No pride but do feel negative toward group

20. How would you rate yourself?

1. Very Asian
2. Mostly Asian
3. Bicultural
4. Mostly Westernized
5. Very Westernized

21. Do you participate in Asian occasions, holidays, traditions, etc.?

1. Nearly all
2. Most of them
3. Some of them
4. A few of them
5. None at all

22. Rate yourself on how much you believe in Asian values (e.g., about marriage, families, education, work):

1 (do not believe)	2	3	4	5 (strongly believe in Asian values)
--------------------------	---	---	---	--

23. Rate your self on how much you believe in American (Western) values:

1 (do not believe)	2	3	4	5 (strongly believe in Asian values)
--------------------------	---	---	---	--

24. Rate yourself on how well you fit when with other Asians of the same ethnicity:

1 (do not fit)	2	3	4	5 (fit very well)
----------------------	---	---	---	----------------------

25. Rate yourself on how well you fit when with other Americans who are non-Asian (Westerners):

1 (do not fit)	2	3	4	5 (fit very well)
----------------------	---	---	---	----------------------

26. There are many different ways in which people think of themselves. Which ONE of the following most closely describes how you view yourself?

1. I consider myself basically an Asian person (e.g., Chinese, Japanese, Korean, Vietnamese, etc.). Even though I live and work in America, I still view myself basically as an Asian person.
2. I consider myself basically as an American. Even though I have an Asian background and characteristics, I still view myself basically as an American.
3. I consider myself as an Asian-American, although deep down I always know I am an Asian.
4. I consider myself as an Asian-American, although deep down, I view myself as an American first.
5. I consider myself as an Asian-American. I have both Asian and American characteristics, and I view myself as a blend of both.

Appendix 11: Copyright of SL-ASIA Chinese Australian version

From: Bibiana Chan <bibiana.wing.chan@gmail.com>

Sent: Wednesday, March 24, 2021 9:12:01 AM

To: Cristina ZENG <Ling.ZENG-1@student.uts.edu.au>

Subject: Request permission to use modified and translated version of SL-ASIA acculturation scale

Hi Ling,

Sorry for the delay in responding. I rarely use the email address you reached me. Yes, you are welcome to use the modified and translated version of the SL-ASIA Acculturation Scale. Please cite the paper "Parker, G., Chan, B., Tully, L., and Eisenbruch, M. (2005). Depression in the Chinese: the impact of acculturation. *Psychological Medicine*, 35(10), 1475-1483".

I hope you can find the 2 versions of the scale from my PhD thesis. All the best with your study.

Kind regards,

Bibiana

P.S. I left UNSW in 2013. I'm now running a Not-for-Profit Social Enterprise 'Community Flower Studio' which is a mental health promotion program in disguise. Check out our website below if you are interested to find out more.

Dr Bibiana Chan, CF

PhD (UNSW)

Founder and President

Community Flower Studio

Ph: [REDACTED]

www.communityflowerstudio.org

email: communityflowerstudio@yahoo.com

Instagram: communityflowerstudio

Like us on Facebook: Community Flower Studio Inc.

Appendix 12: Copyright of BEFF-HM scale

Re: Request the permission to use the Bicultural Efficacy in Health Management (BEFF-HM) scale



Kevin M Chun <chunk@usfca.edu>

7/19/2022 5:54 AM



To: Cristina ZENG



Chun.Kwan.2016.Acculturation...

573.21 KB

Hi Cristina,

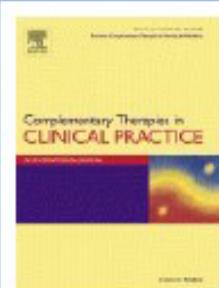
Attached is the journal article that describes the items and psychometric properties of our BEFF-HM scale. Feel free to use the scale in its original form and to reference it in your research. Best wishes on your research endeavors,

Kevin Chun

Kevin M Chun, Ph.D.
Professor of Psychology,
Asian Pacific American Studies & Critical Diversity Studies
Department of Psychology
University of San Francisco
2130 Fulton Street
San Francisco, CA 94117-1080

Appendix 13: Copyright of TCM belief scale

From: no-reply@copyright.com
Sent: Tuesday, September 13, 2022 7:33 PM
To: Cristina ZENG
Subject: Thank you for your order with RightsLink / Elsevier



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Appendix 14: Self-care scale copyright

Instrument Use Agreement

I, Ling ZENG, am requesting to use the Self-care of Coronary Heart Disease Inventory version 2.2 or 3 instrument in English and Chinese

I agree to these Terms and Conditions:

- Not to change the self-care instrument in anyway without explicit permission of the instrument author.
- To calculate scores in the manner prescribed (see website and publications).
- To properly cite the instrument in all publications using it, referring to the original publication.
- To not include the instrument itself in any publication because that transfers the copyright to the journal publisher.

The instrument authors agree to these Terms and Conditions:

- You have permission to use this instrument in your research now and in perpetuity, if the terms and conditions of this agreement continue to be met.

Production Note:
Signature of User: _____ Signature removed prior to publication. Date: 24/02/2021

Production Note:
Signature of Instrument Author: _____ Signature removed prior to publication. Date: 03/09/2021

Appendix 15: The coding process of text responses to the open-ended question

Open question: Is there anything else about how you look after your heart health (or stroke) that you would like to tell me?

Response (quotes)	Subthemes	Themes
P2: It was free to see a cardiologist. Now I don't attend the follow-up as it charges money.	Medical follow-up	Self-care maintenance
P50: In Australia, the next cardiac follow-up is over a half year, which is too long.		
P82: one year ago, there was no charge to see a cardiologist.		
P8: I take medication regularly, and follow doctor's instruction	Medication adherence	
P10: We need to take medication regularly and do more exercises		
P20: Apart from adopting a healthy lifestyle, the effect of taking Traditional Chinese Medicine or Chinese patent medicine on chronic heart disease is pretty good, such as Huangqi, danshen, sanqi, renshen et al.		
P53: The cardiac symptoms are gone, can I stop taking medications (aspirin and statin)?		
P72: What should I do if taking statins affects my liver function?? should I stop taking these medications?		
P74: I pay attention to exercises and control the fat intake. I take K2		
P25: Mood disorders can significantly impact heart health. Maintaining harmonious family and social relations is beneficial to heart health.	Stress management	
P51: Fill the world with love		
P55: I believe that Jesus is the best doctor.		
P81: Paying attention to changes in mood and temperature is an important indicator to prevent stroke and heart attack.		

Open question: Is there anything else about how you look after your heart health (or stroke) that you would like to tell me?

Response (quotes)	Subthemes	Themes
P54: How to eat healthy? What should I do if the blood vessel is blocked again?	Dietary modification	
P74: I pay attention to exercises and control the fat intake. I take K2		
P10: We need to take medication regularly and do more exercises	Physical activity	
P74: I pay attention to exercises and control the fat intake. I take K2.		
P21: The use of a continuous positive airway pressure machine every night can improve blood circulation and sleep quality.	Sleep quality	
P81: Paying attention to changes in mood and temperature is an important indicator to prevent stroke and heart attack.	Avoiding triggers	
P75: it is important to have social support and recognize the cardiac symptoms immediately	Monitoring body symptoms	Self-care monitoring
P54: How to eat healthy? What should I do if the blood vessel is blocked again?	Managing heart symptoms	Self-care management
P75: it is important to have social support and recognize the cardiac symptoms immediately		
P9: I do not know much about heart health knowledge/information	Lack of health literacy	Confidence in heart health knowledge
P45: I don't know how to take care of my heart condition.		
P53: The cardiac symptoms are gone, can I stop taking medications (aspirin and statin)?		
P54: How to eat healthy? What should I do if the blood vessel is blocked again?		

Open question: Is there anything else about how you look after your heart health (or stroke) that you would like to tell me?

Response (quotes)	Subthemes	Themes
P72: What should I do if taking statins affects my liver function?? should I stop taking these medications?		
P13: I lack support and guidance for managing my heart condition.	Requiring for health information	
P40: I want to know more about heart health knowledge information.		
P76: I have family story of hyperlipidaemia, and I hope you can give me some guidance on adjusting a healthy diet and promoting heart health.		
P165: I need heart health information.		
P222: learn more about the verified Australian heart health information		
P257: Please educate us the first aid knowledge to heart attack		

Appendix 16: Ethics Committee approval

The initial ethics application

From: Research.Ethics@uts.edu.au
Sent: Tuesday, August 31, 2021 2:40 PM
To: Research Ethics; Lin Perry; Cristina ZENG
Subject: HREC Approval Granted - ETH21-6096

Dear Applicant

Re: ETH21-6096 - "The impact of acculturation on self-care behaviors among Chinese Australians living with cardiovascular disease"

Thank you for your response to the Committee's comments for your project. The Committee agreed that this application now meets the requirements of the National Statement on Ethical Conduct in Human Research (2007) and has been approved on that basis. You are therefore authorised to commence activities as outlined in your application.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all [UTS policies and guidelines](#) including the Research Management Policy.

Your approval number is UTS HREC REF NO. ETH21-6096.

Approval will be for a period of five (5) years from the date of this correspondence subject to the submission of annual progress reports.

The following standard conditions apply to your approval:

- Your approval number must be included in all participant material and advertisements. Any advertisements on Staff Connect without an approval number will be removed.
- The Principal Investigator will immediately report anything that might warrant review of ethical approval of the project to the [Ethics Secretariat](#).
- The Principal Investigator will notify the Committee of any event that requires a modification to the protocol or other project documents, and submit any required amendments prior to implementation. Instructions on how to submit an amendment application can be found [here](#).
- The Principal Investigator will promptly report adverse events to the Ethics Secretariat. An adverse event is any event (anticipated or otherwise) that has

From: Research.Ethics@uts.edu.au
Sent: Wednesday, April 13, 2022 1:11 PM
To: Research Ethics; Lin Perry; Cristina ZENG; Luna Xu
Subject: UTS HREC Approval - ETH22-7000

Dear Applicant

Re: ETH22-7000 - "The impact of acculturation on self-care behaviors among Chinese Australians living with cardiovascular disease"

The Human Research Ethics Executive Review Committee reviewed your amendment application for your project and agreed that the amendments meet the requirements of the NHMRC National Statement on Ethical Conduct In Human Research (2007). I am pleased to inform you that the Committee has approved your request to amend the protocol as follows:

"In terms of the recruitment strategy, we propose to expand our recruitment to include recruiting participants via medical centers in the community. We have targeted general practice clinics in areas of Sydney with large Chinese Australian populations in the local community. The managers or health practitioners at these general practice clinics will help to distribute project flyers at the clinic and encourage eligible participants to contact the researcher (LZ). Paper-based information flyers written in Chinese will be distributed at these general practice clinics. Potential participants will be asked to contact the researcher (LZ) via mobile phone using a phone number used only for this study use, to maintain privacy and security issues for the researcher. Researcher will approach the following general practice clinics and get support to host and make flyers available for distribution: MyHealth Chatswood Westfield MyHealth Chatswood Chase MyHealth Eastwood MyHealth Parramatta MyHealth North Rocks Multicare Family Medical Centre FamilyWise Medical Practice So far, we get support from the manager at MyHealth Parramatta in the form of email. For the other practice centers, we will follow-up the managers and update the support evidence to the Committee if we need more participants to get involved in the project."

This amendment is subject to the standard conditions outlined in your original letter of approval. You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all [UTS policies and guidelines](#) including the Research Management Policy.

You should consider this your official letter of approval. If you require a hardcopy please contact the Research Ethics Secretariat.

To access this application, please [click here](#), a copy of your application has also been attached to this application

If you wish to make any further changes to your research, please contact the Research Ethics Secretariat in the Research Office.

In the meantime I take this opportunity to wish you well with the remainder of your research.

Yours sincerely,
The Research Ethics Secretariat

on behalf of the Human Research Ethics Executive Review Committee
C/- Research Office
University of Technology Sydney
T: (02) 9514 2478

The first amendment application

From: Research.Ethics@uts.edu.au
Sent: Wednesday, April 13, 2022 1:11 PM
To: Research Ethics; Lin Perry; Cristina ZENG; Luna Xu
Subject: UTS HREC Approval - ETH22-7000

Dear Applicant
Re: ETH22-7000 - "The impact of acculturation on self-care behaviors among Chinese Australians living with cardiovascular disease"

The Human Research Ethics Executive Review Committee reviewed your amendment application for your project and agreed that the amendments meet the requirements of the NHMRC National Statement on Ethical Conduct In Human Research (2007). I am pleased to inform you that the Committee has approved your request to amend the protocol as follows:

"In terms of the recruitment strategy, we propose to expand our recruitment to include recruiting participants via medical centers in the community. We have targeted general practice clinics in areas of Sydney with large Chinese Australian populations in the local community. The managers or health practitioners at these general practice clinics will help to distribute project flyers at the clinic and encourage eligible participants to contact the researcher (LZ). Paper-based information flyers written in Chinese will be distributed at these general practice clinics. Potential participants will be asked to contact the researcher (LZ) via mobile phone using a phone number used only for this study use, to maintain privacy and security issues for the researcher. Researcher will approach the following general practice clinics and get support to host and make flyers available for distribution: MyHealth Chatswood Westfield MyHealth Chatswood Chase MyHealth Eastwood MyHealth Parramatta MyHealth North Rocks Multicare Family Medical Centre FamilyWise Medical Practice So far, we get support from the manager at MyHealth Parramatta in the form of email. For the other practice centers, we will follow-up the managers and update the support evidence to the Committee if we need more participants to get involved in the project."

This amendment is subject to the standard conditions outlined in your original letter of approval. You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all [UTS policies and guidelines](#) including the Research Management Policy.

You should consider this your official letter of approval. If you require a hardcopy please contact the Research Ethics Secretariat.

To access this application, please [click here](#), a copy of your application has also been attached to this application

If you wish to make any further changes to your research, please contact the Research Ethics Secretariat in the Research Office.

In the meantime I take this opportunity to wish you well with the remainder of your research.

Yours sincerely,
The Research Ethics Secretariat

on behalf of the Human Research Ethics Executive Review Committee
C/- Research Office
University of Technology Sydney
T: (02) 9514 2478

The second amendment application

From: Research.Ethics@uts.edu.au
Sent: Tuesday, August 23, 2022 4:44 PM
To: Research Ethics; Lin Perry; Cristina ZENG; Luna Xu
Subject: UTS HREC Approval - ETH22-7434

Dear Applicant

Re: ETH22-7434 - "The impact of acculturation on self-care behaviors among Chinese Australians living with cardiovascular disease"

The Human Research Ethics Executive Review Committee reviewed your amendment application for your project and agreed that the amendments meet the requirements of the NHMRC National Statement on Ethical Conduct In Human Research (2007). I am pleased to inform you that the Committee has approved your request to amend the protocol as follows, with conditions:

Amendment to study:

"We propose to add a new recruitment site to the original 8 Chinese Community Associations in local areas in Sydney. The new recruitment will be from the Multicultural Chinese Community at Newcastle. The organizer is Mr Jay , contact number [REDACTED]"

Conditions:

Evidence of support from the new site (Multicultural Chinese Community, Newcastle) is to be provided to the Ethics Secretariat once obtained.

This amendment is subject to the standard conditions outlined in your original letter of approval. You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all [UTS policies and guidelines](#) including the Research Management Policy.

You should consider this your official letter of approval. If you require a hardcopy please contact the Research Ethics Secretariat.

To access this application, please [click here](#), a copy of your application has also been attached to this application

If you wish to make any further changes to your research, please contact the Research Ethics Secretariat in the Research Office.

In the meantime I take this opportunity to wish you well with the remainder of your research.

Yours sincerely,
The Research Ethics Secretariat

on behalf of the Human Research Ethics Executive Review Committee
C/- Research Office
University of Technology Sydney
T: (02) 9514 2478
Research.Ethics@uts.edu.au | [Website](#)
PO Box 123 Broadway NSW 2007
Ref: E13-3

The third amendment application

HREC Approval Granted - ETH23-8385

RE: Research.Ethics@uts.edu.au
To: Research Ethics; Cristina ZENG; Lin Perry

 Ethics Application.pdf 267 KB

 Translate message to: English | Translation preferences

Dear Applicant

Re: ETH23-8385 - "The impact of acculturation on self-care behaviors among Chinese Australians living with cardiovascular disease"

The UTS Human Research Ethics Executive Review Committee reviewed your amendment application for your project and agreed that the amendments meet the requirements of the NHMRC National Statement on Ethical Conduct In Human Research (2007). I am pleased to inform you that the Committee has approved your request to amend the protocol as follows:

"We propose to widen the inclusion criteria to include people have lived anywhere in Australia for at least six months at recruitment, without requiring for Australian citizenship or permanent residency. We also propose to add new recruitment sites : 1. We will explore new Chinese associations/centers, including but not limited to Chinese Australian Service Society and Christian Chinese Association. Other potential self-organized Chinese senior groups , community libraries and churches will be approached. It is a progressive and ongoing recruitment strategy as we will find more senior groups from managers and potential participants, until the required sample size is achieved. 2. We will expand to recruit participants at private cardiac clinics. Printed flyers will be available at the clinic reception desk, in the waiting area or consultant room (as preferred by each site) for participants to access. Researcher LZ will notify staff of times, when she will be available onsite at each centre for limited periods to hand out flyers in a public area to anyone who expresses interest and to answer any questions. Participants can complete the survey via scanning the QR code in the flyer at their convenience, or they can contact researcher LZ to complete it (contact details provided on the flyer). Personnel at the medical centres have not been asked to distribute flyers. Researcher will approach clinics, including but not limiting to: • United Cardiology • Sydney North Cardiology • Hurstville sacred heart clinic • CT Heart Clinics • Sydney Specialists Centre • Eastern Heart Clinic • Hurstville Private Heart Centre • Sydney Heart To date support has been achieved from Dr Austin Ng at Sydney North Cardiology by email, and Professor Andy Yong at United cardiology by email and zoom meeting. We will follow-up with the doctors of other cardiac centres and update the Committee as support is available if we need to recruit from other cardiac centres."

This amendment is subject to the standard conditions outlined in your original letter of approval.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all [UTS policies and guidelines](#) including the Research Management Policy.

You should consider this your official letter of approval. If you require a hardcopy please contact the Ethics Secretariat.

To access this application, please [click here](#), a copy of your application has also been attached to this email.

If you wish to make any further changes to your research, please contact the Research Ethics Secretariat on 02 9514 2478.

In the meantime I take this opportunity to wish you well with the remainder of your research.

Yours sincerely,

The Research Ethics Secretariat

on behalf of the Human Research Ethics Executive Review Committee

C/- Research Office
University of Technology Sydney
Research.Ethics@uts.edu.au | [Website](#)
PO Box 123 Broadway NSW 2007

Ref: E41

Appendix 17: Data management plan



The impact of acculturation on self-care behaviors among Chinese Australians with cardiovascular disease

Description

It has been widely reported that Chinese immigrants in Western countries experience disadvantageous cardiovascular disease (CVD) profiles, with increased CVD risk factors, higher CVD incidence and poorer disease management. Evidence-based self-care is essential to mitigate CVD symptoms and maintain health status. The complexity of self-care practices is grounded in individuals' cultural beliefs, personal habits and environmental situations. However, the current literature on self-care behaviours and related cultural factors among Chinese immigrants is scarce, with even less studies addressing the impact of acculturation. Accordingly, the aim of this study is to explore the acculturation experience and identify the self-care practices among Chinese immigrants living with CVD in Australia, and to describe the impact of acculturation experiences on their self-care behaviours. Exploratory sequential design will be used to provide insight into the impact of acculturation on self-care behaviors among Chinese Australians with CVD. The study will encompass two phases: phase 1 will collect qualitative data via interview to explore the acculturation experiences and self-care behaviors reported by participants. Following the qualitative results, instruments with culturally and contextually sensitive characteristics will be used in phase 2 quantitative survey study to assess the relationship of acculturation and self-care behaviors.

[Expand/Collapse all](#)

- Project

Project overview

Project name

The impact of acculturation on self-care behaviors among Chinese Australians with cardiovascular disease

Project ID



HDR student project

Project description

It has been widely reported that Chinese immigrants in Western countries experience disadvantageous cardiovascular disease (CVD) profiles, with increased CVD risk factors, higher CVD incidence and poorer disease management. Evidence-based self-care is essential to mitigate CVD symptoms and maintain health status. The complexity of self-care practices is grounded in individuals' cultural beliefs, personal habits and environmental situations. However, the current literature on self-care behaviours and related cultural factors among Chinese immigrants is scarce, with even less studies addressing the impact of acculturation. Accordingly, the aim of this study is to explore the acculturation experience and identify the self-care practices among Chinese immigrants living with CVD in Australia, and to describe the impact of acculturation experiences on their self-care behaviours. Exploratory sequential design will be used to provide insight into the impact of acculturation on self-care behaviours among Chinese Australians with CVD. The study will encompass two phases: phase 1 will collect qualitative data via interview to explore the acculturation experiences and self-care behaviours reported by participants. Following the qualitative results, instruments with culturally and contextually sensitive characteristics will be used in phase 2 quantitative survey study to assess the relationship of acculturation and self-care behaviours.

Keywords

Start date

01/01/2020

End date

01/01/2020

Funders

Grant ID

- People

People

First-named chief investigator / UTS supervisor

Name	Email	Project Role	ORCID
Linda Perry	Lin.Perry@uts.edu.au	Chief Investigator	

Data manager

Name	Email	Project Role	ORCID
Ling ZENG	Ling.ZENG-1@student.uts.edu.au	Data manager	

Contributors

Name	Email	Project Role	ORCID
Contributors			

Additional supervisors

Name	Email	Project Role	ORCID
Luna Xu	luna.xu@unsw.edu.au	Supervisor	

Ethics and Security

Initially your research data is classified as UTS Internal. To improve the accuracy of this classification, please answer the following

Information Security Classification

UTS: Confidential

Does the research involve:

Human participant data

Will the data you collect from individuals include personal information?

Yes

Will the data you collect from individuals include sensitive personal information other than health information?

Yes

Will the data you collect from individuals include health information?

Yes

Will any data or information be individually identifiable or potentially re-identifiable (i.e. include codes) at any stage of the research?

Yes

Outline any potential risk to participants from accidental disclosure of the data and any strategies for minimising those risks

The participant's privacy and confidentiality may be undermined. At the initial stage of data analysis, participants' personal identification in each interview transcript will be de-identified with a code. A file will be set up to record the linkage between the actual individual identifications and codes. This digital file will be saved in UTS OneDrive restricted with passwords, and hardcopy will be stored in Health Faculty.

If you are collecting data from residents of countries other than Australia, which countries?

Is Ethics approval required for your project?

Yes

Data collection and storage

Please provide a brief description of your data collection methodology

As mentioned before, this research project will encompass two phases.

Phase 1 will collect qualitative data via interview to explore the acculturation experiences and self-care behaviors reported by participants. Semi-structured interviews will be used to collect the data. Within the restriction of social distancing in place at the time due to the COVID-19 pandemic, participants are free to choose one of these interview methods: face-to-face, phone call, electronic media (such as WeChat), or whatever other platform they prefer. The interviews will be audio-recorded.

Following the qualitative results, instruments with culturally and contextually sensitive characteristics will be used in phase 2 quantitative survey study to assess the relationship of acculturation and self-care behaviors. Participants who consent to participate in the self-administered survey will be free to choose one of the methods for completing the survey: filling a written survey at community association centres, or online survey via WeChat or email link.

Predominant file type(s), e.g. textual, tabular, image or recording. Give file format if known

Audio-recordings, surveys (online and papers).

Data storage location

UTS provided survey platform (e.g Qualtrics, REDCap, etc)

UTS provided collaboration space (e.g. CloudStor, OneDrive etc)

If other, provide further details: (Including access arrangements for the minimum retention period)

For hard copy data (consent forms and surveys), the original version will be firstly scanned and saved in UTS-OneDrive, and then stored in suitable places allocated by UTS Health.

Describe the form(s) of the identifiable or re-identifiable data

Audio-recordings from interview and related transcripts

What platforms or tools will you use to collect or import identifiable or re-identifiable data?

OneDrive

Where will the identifiable or re-identifiable data be stored?

OneDrive

Will you be seeking prior informed consent to publish identifiable participant data?

Yes

What additional security will be applied to identifiable or re-identifiable data:
Additional Password (other than authentication)

Will identifiable or re-identifiable data be transferred in or out of secure UTS storage (e.g. in from linkage agency, out for transcription)?

No

Will you de-identify the data?

Yes

Outline how and when (e.g. after transcription, before analysis) you will de-identify the data:

Where will any link files (files that match pseudonyms/codes to identifiable information) be stored?

- Data retention and disposal

Data retention and disposal

Minimum retention period

5 years (general research)

The data steward is:

Linda Perry

Have you made commitments to destroy part of the data prior to end of retention period (e.g original recordings, linking/code files)?

No

If participant data will be retained for secondary use by yourself or shared with other researchers, will you obtain:

- Access and rights

Access and rights

Copyright and intellectual property owners of data created in project

University of Technology Sydney jointly with... (enter other owners below)

Please list any other owners:

With higher degree research student

Access after the project will be

Mediated, by permission from the data manager

Are you using any secondary or third-party data?

No

Is the data:

Have the data custodian/s, if any, agreed to provide access to the data for use in the proposed research?

What ownership agreement governs your use of the data?

Licences or Agreements:

- Research Workspace

Research Workspace

Associated workspaces

Name	Description	Location	Type

Appendix 18: The published papers

Received: 16 February 2024 | Revised: 7 May 2024 | Accepted: 7 June 2024
DOI: 10.1111/jan.16302

EMPIRICAL RESEARCH QUALITATIVE

JAN
Journal of Advanced Nursing Research

WILEY

Self-care behaviours of first-generation Chinese immigrants living with cardiovascular disease: A qualitative study

Ling Zeng¹   | Xiaoyue Xu^{1,2}  | Lin Perry¹ 

¹School of Nursing and Midwifery, Faculty of Health, University of Technology Sydney, Ultimo, New South Wales, Australia

²School of Population Health, Faculty of Medicine, University of New South Wales, Kensington, New South Wales, Australia

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Funding information

Australian Government Research Training Program Scholarship

Abstract

Aim: To identify and describe self-care behaviours performed by Chinese immigrants living with cardiovascular disease in Australia, and factors perceived as barriers and facilitators to evidence-based cardiac self-care.

Design: A qualitative descriptive design.

Methods: Individual semi-structured phone interviews were conducted among participants meeting the following criteria: (1) first-generation Chinese immigrants to Australia, born in Mainland China, Hong Kong, Macao or Taiwan; (2) Australian permanent residents or citizens; (3) self-reported or medically diagnosed with coronary heart disease, stroke or heart failure; (4) able to speak English or Mandarin; (5) able to provide informed consent, excluding those with history or evidence of impaired cognition such as dementia. Participants were recruited via social media, Chinese community associations and medical centres from September 2021 to June 2022. Data were analysed using inductive and deductive thematic analysis, guided by the Middle-Range Theory of Self-Care of Chronic Illness. The study was reported in line with the COREQ checklist.

Results: Twenty participants were interviewed, 60% female, mean age 69.9 years. Most migrated to Australia at older age following their retirement in China; most had limited English proficiency. Many practiced adequate self-care for their CVD in self-care maintenance and monitoring. Various, they adopted heart-healthy diets, developed exercise routines, attended medical services and closely monitored their body signs and symptoms. However, self-adjusting medications, taking Traditional Chinese Medicine and self-administering health supplements were prevalent practices and first-response management of acute cardiac symptoms was suboptimal. Linguistic and cultural barriers to obtaining mainstream heart health information meant most participants resorted to informal, anecdotal and mainland Chinese sources.

Conclusion: Diverse factors were held responsible for sub-optimal self-care behaviours but lack of access to linguistically and culturally appropriate heart health information was widely blamed. Linguistically and culturally appropriate community-based heart health education programmes are urgently needed, targeting healthy lifestyle modification, medication literacy and cardiac symptom management.

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Impact: Study findings can be used to improve cardiac nurses' cultural sensitivity and practices targeting Chinese immigrants. Partnering with Chinese community associations offers health service providers and policymakers an innovative route to co-design and deliver targeted heart health education interventions and support for this population.

Public Contribution: Chinese community centre managers contributed to data collection by supporting participant recruitment.

KEY WORDS

cardiovascular disease, Chinese immigrants, chronic disease management, health behaviour, self-care

1 | INTRODUCTION

Cardiovascular disease (CVD) refers to a variety of heart and vascular problems and is the leading cause of mortality globally (WHO, 2021). In Australia, CVD accounted for 25% of all deaths and 600,000 hospitalizations in 2021 (AIHW, 2023). However, it poses a disproportionate burden on immigrant compared to host populations, resulting in CVD health disparities in immigrant populations (Agyemang & van den Born, 2022). Self-care is crucial in reducing cardiovascular morbidity and mortality (Riegel et al., 2017). As the concept of self-care developed, the Middle-Range Theory of Self-Care of Chronic Illness was elucidated (Riegel et al., 2012), encompassing three core domains: self-care maintenance, self-care monitoring and self-care management. Self-care maintenance comprises behaviours performed to stabilize the illness process or maintain health status, such as healthy lifestyle adaptation and medication adherence. Self-care monitoring refers to activities for recognizing and observing body changes, such as measuring blood pressure. Self-care management entails patients' evaluation of the treatment and their response to changed body signs and symptoms (Riegel et al., 2012). However, it can pose challenges for immigrants as they navigate a newly adopted healthcare system with attendant language and cultural barriers.

Chinese immigrants, as a subgroup of the migratory population, present one of the largest and fastest-growing global immigrant groups (Gong & Zhao, 2016). The western countries where the largest numbers of Chinese people have migrated include the United States of America (USA), Canada, Australia, New Zealand and the United Kingdom (Li et al., 2018). In Australia, the Chinese immigrant population has grown rapidly since 2006, and by 2021 was the third-largest overseas-born migrant group (ABS, 2022). In the same year in the USA, this population was the largest Asian immigrant group, with 5.2 million people (USCB, 2023). Notably, in recent years many Chinese people have relocated to western countries at relatively older ages through the sponsorship of adult children who migrated first. These first-generation Chinese immigrants (those born in China who migrate to a host country) have different experiences from second- and subsequent-generation Chinese immigrants (the children of first or subsequent-generation

migrants, who were born in the host country) as life-long exposure to the host culture will have significantly impacted their level of acculturation within this country, for example in terms of language proficiency, cultural health beliefs and lifestyle. Similarly, Chinese acculturation to the host country for immigrants of mixed rather than unitary ethnic background may be a more complex matter in terms of health behaviours (Bainey et al., 2018; Zeng et al., 2023; Zhang et al., 2023).

Robust evidence has indicated that Chinese immigrants experience suboptimal CVD profiles. A large national cohort study found that the increasing prevalence of CVD risk factors such as obesity and diabetes in Chinese immigrants was associated with longer residence in the host country (Jin et al., 2017). According to a systematic review involving 258,474 participants, compared to their counterparts in China, Chinese immigrants had a higher prevalence and mortality from coronary heart disease (Gong & Zhao, 2016). Further, results from a meta-analysis with eight cohort studies showed higher short-term mortality after CVD diagnosis in Chinese immigrants than in the host population (Jin et al., 2015).

Self-care plays an important role in the prevention and management of CVD (Riegel et al., 2017) found that cardiac patients only spent about 10 h per year with their healthcare providers, so most of the care cardiac patients experience for their CVD occurs outside of healthcare settings. Self-care comprises evidence-based practices for reducing cardiac mortality and hospital readmissions, and increasing quality of life (Riegel et al., 2017; Virani et al., 2023).

Multiple factors are known to influence patients' adherence to self-care behaviours, such as social determinants of health (such as education and income), health literacy, personal habits, culture and health beliefs, among others (Riegel et al., 2017; Virani et al., 2023). All these factors can complicate self-care and challenge patients with CVD in performing self-care practices. The complexities of self-care practice put extra strain on immigrant populations who work between their native and host cultures (Osokpo et al., 2021; Osokpo & Riegel, 2021). Chinese immigrants in western countries have to adapt to new lifestyles, cope with the stresses of acculturation and negotiate the different health beliefs, treatment mechanisms

and healthcare systems of their origin and host countries. All these considerations can differentiate Chinese immigrants' self-care behaviours from those of the host population.

A better understanding of self-care behaviours among first-generation Chinese immigrants living with CVD could facilitate the development of targeted interventions to improve their self-care behaviours and optimize their CVD health outcomes in Chinese immigrant populations. However, studies describing self-care behaviours in first-generation Chinese immigrants with CVD are scarce with only three quantitative and two qualitative studies identified. They can also be methodologically limited. For example, quantitative surveys, a popular approach, presuppose knowledge of the questions to ask (Zeng et al., 2023). Self-care behaviours in these studies were limited to lifestyle modification, medication adherence and seeking healthcare resources. Further, studies do not always distinguish first from second or mixed generations of migrants, whose self-care practices may vary significantly depending on their level of acculturation (Bainey et al., 2018).

2 | METHODS

2.1 | Study aims

To address this gap, this study aimed to identify and describe self-care behaviours performed by first-generation Chinese immigrants living with CVD in Australia, and factors perceived as barriers and facilitators to evidence-based self-care.

2.2 | Design

Grounded in philosophical assumptions of naturalism/constructivism, a qualitative descriptive approach was employed in this study: an appropriate choice for early exploratory work in an understudied population, providing rich description despite limited time and resource availability (Bradshaw et al., 2017; Neergaard et al., 2009). The study was reported in line with the Consolidated Criteria for Reporting Qualitative Research (Tong et al., 2007).

2.3 | Study setting and recruitment

Participants were included if they were as follows: (1) adults who were first-generation Chinese immigrants to Australia, born in Mainland China, Hong Kong, Macao or Taiwan; (2) Australian permanent residents or citizens; (3) self-reported or medically diagnosed with CVD, including coronary heart disease, stroke or heart failure; (4) able to speak English or Mandarin; (5) able to provide informed consent, excluding those with history or evidence of impaired cognition such as dementia.

Purposive and snowball sampling were used in the study. Participants were recruited from three sources: social media,

Chinese community associations and medical centres in Sydney, Australia. Electronic recruitment flyers were distributed via commonly used social media among Chinese immigrants in Australia, such as WeChat, the Sydney Today mobile app and 2ac Australian Chinese Radio. To be compliant with the public health orders in place to manage the COVID-19 pandemic at the time, the first author contacted gatekeepers of Chinese community associations to support recruitment by circulating electronic flyers in their community WeChat, Facebook and other online channels. After COVID restrictions were lifted, in May 2022 she attended Chinese community associations' social activities and circulated paper flyers in person and printed flyers were placed in reception areas at a medical centre. Potential participants were asked to circulate the information to any family and friends who met the criteria. Participants who were interested in this research were invited to contact the first author via a phone number or email address. Recruitment continued until data saturation was reached, that is, until no new information emerged during interviews (Bradshaw et al., 2017). The recruitment period was from September 2021 to June 2022.

2.4 | Data collection

The first author is a registered nurse and bilingual researcher with translation certification accredited by the National Translation Authority. Sharing the same cultural background with the potential participants, she understood some local dialects and cultural health beliefs and practices, which facilitated the conduct of the interviews. The author had no contact with any participants before the research project and maintained a neutral and non-judgemental attitude toward participants.

Having screened potential participants for eligibility, the first author explained the research verbally and supplied an information sheet and consent form to eligible participants. Simultaneously, participants' cognitive status was assessed through their understanding and appropriateness of responses during the conversation. The dates and times for the phone interviews were agreed with participants. Participants were interviewed in Mandarin, their preferred language. Each interview was audio-recorded with consent, and the researcher took field notes.

A semi-structured interview was used, with an interview guide informed by the Middle-Range Theory of Self-care of Chronic Illness (Riegel et al., 2012, 2017). This was drafted, discussed and revised among the author group and piloted with volunteers whose data were not included in the study analysis. The interview started with structured questions about participants' demographic and clinical data related to their CVD diagnosis, followed by the open question: 'Since you received your heart diagnosis, what do you do to take care of your heart health at home?' Probes were used to enable the participants to expand and articulate their CVD self-care behaviours in relation to self-care maintenance, self-care monitoring and self-care management, and to identify factors which they perceived as barriers and facilitators of this (Table 1).

TABLE 1 Interview guide.

1. What is your heart problem? Can you briefly tell me what happened?
<i>Probes</i>
• Time, place of the initial heart diagnosis
• Risk factors for heart disease (listed individually)
• Treatment plan (medications)
• How did you feel about the initial heart diagnosis
2. Apart from medication, what advice have you received to manage your heart disease from health professionals?
3. Regarding any health advice you received, what did you do at home?
In the early days following the heart diagnosis, what did you do to take care of your heart health?
<i>Probes</i>
• How did you take your medication?
• Take it regularly? Missing doses? Stop it?
• Western medicine / TCM? Traditional Chinese patent medicine /supplement
• Monitor/response to side effects?
• Seeking healthcare services?
• Doctor (GP, cardio specialist, allied health?/ ethical background)
• Reasons for health services (follow-up, medication, symptoms...flu vaccination)
• Communication (barriers?)
• How did you find and learn the heart health materials?
• Any changes in lifestyles?
• Diet (food choices, who cook), smoking/alcohol, social meals
• Exercise (type, frequency, with anyone? Noticed any symptoms?)
• Weight?
• Cope stress?
• Sleep? Social activities?
• Symptom monitor and response? (since the initial diagnosis, have you had any cardiac symptoms?)
• How did you monitor? (BP, blood sugar, cholesterol, INR)
• What symptoms make you relate them to your heart problem?
• What did you do with the heart symptoms?
• (optional) How did you prevent the heart event? Triggers?
4. How did the diagnosis impact your family? What did they do with your heart health?
• Supervision: Medication? Lifestyles? Seeking healthcare? Health information?
• Monitor: Symptoms
• Assistant: Meals/ seek healthcare?
5. Nowadays, what do you do for your heart health? Can you tell me about any changes compared to your past experiences taking care of your CVD? Why did you make these changes?

2.5 | Data analysis

The audio files were transcribed verbatim in Chinese by the first author (Clark et al., 2017). During the process, interview data were de-identified to ensure the participants' confidentiality. Twinn (1997) states that the consistency and reliability of data translation in cross-language interview studies can be improved by using an independent translator to translate interview transcripts (Al-Amer et al., 2015). Accordingly, in this study, a professional translator independently translated transcripts into English. These translated transcripts were

then independently validated by two bilingual researchers in the authorship team. The translated and validated transcripts were imported into NVivo 12 software for data analysis.

Deductive thematic analysis was employed (Clarke & Braun, 2017) with a predetermined list of codes informed by the Middle-Range Theory of Self-care of Chronic Illness and related self-care inventory (Riegel et al., 2019). In line with Braun and Clarke's (2017) guideline, the first author immersed herself in the data through repeatedly listening to the audio recordings for transcription, translation, validation and coding. At the same time, the author team inductively generated new codes where data addressed the research aim but content was additional to the Theory of Self-care of Chronic Illness. The initial coding results were reviewed and decisions on overarching themes made by the three members of the author team. An example of data coding process is presented in Table S1.

2.6 | Ethical considerations

This study was approved by the Human Research Ethics Committee at the University of Technology Sydney, Australia (ETH21-6096).

2.7 | Trustworthiness

In line with trustworthiness criteria developed by Lincoln and Guba (1985), all the authorship team engaged in peer-debriefing and reflection during the data collection and analysis to ensure credibility. Prolonged engagement in data collection and data analysis was executed by the first author. Transferability was established by providing a rich description of study participants, the location and the context of the research. To improve dependability, independent data translation and analysis of transcripts were conducted and then checked by the authorship team. Any discrepancies encountered during coding and analysis were discussed to achieve consensus. An audit trail was recorded for research-related decisions during the process. Moreover, potential personal bias during data collection was described and discussed among the authorship team to improve confirmability.

3 | FINDINGS

3.1 | Characteristics of participants

Telephone interviews (mean duration: 63.6 min, ranging from 35.9 to 135.2 min) were conducted with 20 participants. There was no drop-out during the interviews. The mean age of participants was 69.9 years old; 12 were female. Most had migrated to Australia at relatively older ages, following their retirement in China. On average, they had lived in Australia for 14.4 years and all had limited English proficiency. Most were married and living with a partner or an extended family. All participants were covered under Australia's

universal health insurance, and half were privately medically insured. Most participants reported a diagnosis of coronary heart disease while three had experienced a stroke. Many were diagnosed in Australia and had been living with CVD for more than 3 years. Most were prescribed conservative medications to manage their CVD initially (Table 2).

3.2 | Self-care behaviours, barriers and facilitators

Self-care behaviours were organized into three themes: self-care maintenance, self-care monitoring and self-care management. Within each theme, subthemes specified the domains of self-care behaviours (Table 3). Some themes were accompanied by identification of factors perceived as influencing these self-care behaviours.

3.2.1 | Theme one: Self-care maintenance

Dietary practices

The dietary practices adopted by these Chinese Australian participants following their CVD diagnosis were diverse and fell into three categories: adaptation to heart-healthy diets, maintenance of poor eating practices and continuance of previous healthy eating practice.

Adaptation to heart-healthy diets. Many participants attentively adapted to heart-healthy diets following their heart disease diagnosis. Those who made a conscious effort to incorporate heart-healthy dietary habits into their eating patterns changed their cooking styles and taste preferences by using less oil, salt and deep-frying. For example, they boiled food with water rather than braised with soy sauce. Changed choices of ingredients were also frequently mentioned. They restricted consumption of red or fatty meat which they replaced with fish and skinless chicken, and increased their intake of fruits, vegetables, wholegrain and beans. A few reduced their serving portion sizes or changed their main meal from dinner to lunch.

Compared to the past, I cut down on the amount of vegetable oil and animal oil...I used to put some sesame oil, we called Xiangyou. Here, I use olive oil instead

(P8, male, 71yrs, CHD 6 yrs).

For many participants, the motivation to change to a heart healthy diet stemmed from their high health literacy and how they regarded their diagnosis of heart disease. Having recognized that dietary habits are closely related to the development of heart disease and healthy diets to its management, participants changed their dietary practices. Participants also stressed that they shifted the focus of their lives to promote their general and heart health

TABLE 2 Participants' socio-demographic and clinical profile (n=20).

Characteristics	Mean (SD), N	Range (%)
Age (years)	69.6 (4.7)	61-79
		40-45 ^a
Duration of Australian residence (years)	14.4 (11.6)	2-42
Gender		
Male	8	40
Female	12	60
English proficiency		
Poor	9	45
Basic	9	45
Good	2	10
Education level		
Middle school	2	10
High school	6	30
Junior college	5	25
Bachelor	7	35
Marital status		
Married	18	90
Divorced	1	5
Widowed	1	5
Living status		
Alone	1	5
With partner	11	55
With partner and children	4	20
With extended family	4	20
Employment status		
Part-time	1	5
Full-time	1	5
Unemployed	1	5
Retired	17	85
Private insurance	10	50
CVD diagnosis		
Coronary heart disease	17	85
Stroke	3	15
Duration of CVD diagnosis (years)		
≤1	1	5
>1 and ≤3	7	35
>3 and ≤10	10	50
>10	2	10
Place of CVD diagnosis		
Mainland China	6	30
Australia	14	70
CVD risk factors		
Hypertension	6	30
Hyperlipidaemia	14	70

(Continues)

TABLE 2 (Continued)

Characteristics	Mean (SD), N	Range (%)
Hyperglycaemia	1	5
Family history	6	30
Smoking	3	15
Depression	1	5
Other	3	15
Initial treatment		
Lifestyle intervention	1	5
Conservative medication therapy	16	80
Hospital admission treatment ^b	3	15
Number of chronic conditions		
None	3	15
1	11	55
2	4	20
3+	2	10

Abbreviation: CVD, cardiovascular disease.

^aOne participant only reported her age in this range.

^bInclude coronary artery bypass graft operation, stent operation and thrombolysis.

in their retirement, and thus they put effort into adopting healthy dietary practices.

Although I knew it (high cholesterol) was bad, I did not know it would result in heart disease... Many years ago, I was too preoccupied with my work to be able to commit to my health

(P4, female, 65yrs, CHD 4yrs).

Participants also reported that dietary acculturation to the food environment of Australia also served as a facilitator for them to adapt to a healthier diet. For example, most participants shifted to western-style breakfasts (such as milk, cereals or bread), and some embraced local vegetables as they believed these foods were healthy.

Here, I also try to eat more Australian local vegetables, because they are healthier...so I also cook them sometimes

(P6, male, 68yrs, CHD 3 yrs).

Maintenance of poor eating practices. However, half the participants still maintained at least some of their previous unhealthy eating practices without restriction. They reported not paying attention to recommendations about heart-healthy diets following their CVD diagnosis and instead continued consuming fatty meat, deep-fried food, high-salt items, sugary snacks and big portions of food.

No, I am not on any restricted diet... I do like to eat fatty meat. I still eat it. I eat that every day

(P1, male, 71yrs, CHD 6 yrs).

TABLE 3 Main themes and subthemes from the thematic analysis of qualitative interviews.

Themes	Subthemes
Self-care maintenance	<ul style="list-style-type: none"> Dietary practices <ul style="list-style-type: none"> • Adaptation to heart-healthy diets^a • Maintenance of poor eating practices • Continuance of previous healthy eating practices Physical activities <ul style="list-style-type: none"> • Developing exercise routines • Limiting exercise or maintaining physical inactivity Medication adherence <ul style="list-style-type: none"> • Adherence to prescribed western medication • Use of Traditional Chinese medicine • Self-administration of health supplements Stress management Medical follow-ups Seeking health information Other self-care maintenance behaviours <ul style="list-style-type: none"> • Sleep and rest patterns • Drinking and smoking behaviours • Flu vaccination • Being vigilant to avoid triggers of angina
Self-care monitoring	<ul style="list-style-type: none"> Interpreting bodily symptoms Checking bodily signs Medication monitoring
Self-care management	<ul style="list-style-type: none"> Angina management Bodily signs management Medication management

^aHeart healthy diet: diet pattern is rich in vegetables, fruit and wholegrains, reduce in unhealthy fats, salt and added sugar.

Multiple barriers to adaptation to heart-healthy diets were reported. Coming from a collectivistic culture, Chinese participants' commitment to family could be a hurdle to adopting or maintaining heart-healthy diets. These participants prioritized their families' needs over their own when conflicts emerged between family eating preferences and their heart-healthy dietary regime.

...a big challenge for me since I came to Australia (laughing) I eat a lot for dinner, because everyone is at home at the dinner time ... I eat many meat dishes which made me gain weight... As I prepare the family dinner, I have to taste the food. As a result, I end up eating more meat than I should without even realizing it. So, that is the problem

(P16, male, 76yrs, CHD 7yrs).

Lack of diet-related health education was a determining factor reported by some participants for not adapting their diet. Some participants said they had not received any or adequate health

education on heart-healthy diets from doctors. Other participants pointed out that the diet-related health education they received from doctors was too general and broad. They also stressed that dietary behaviours are personal habits that doctors need to take into account when providing health education.

There is no specific (health education) tailored to me as guidance, even though it has been more than 4 years since I got cardiovascular disease...Also, I do not receive individualized dietary advice from professionals like dietitians. (I expected to) hear from someone about this... I am very confused. I did not get any good advice in this regard

(P2, male, 68yrs, CHD 4yrs).

Participants reported that dietary habits which had been ingrained for a lifetime were not easily shifted. Moreover, some also confessed that they wanted to preserve the joy in life that they perceived to be conveyed by their customary diets for their quality of life. Hence, they did not, or not much restrict their dietary practices.

I am not worried about it (eating fried food) ... I do not want my life quality to be decreased after I get cardiovascular disease. I still hope I can maintain the quality of my life, in order to eat what I like and to engage in the activities I enjoy

(P2, male, 68yrs, CHD 4 yrs).

Continuance of previous healthy eating practices. In some cases, (female) participants maintained dietary practices without making any deliberate changes where their dietary habits had previously been consistent with heart-healthy recommendations. Such diets were characterized by rarely eating meat, using little salt and oil, and meals being largely vegetable based.

Physical activities

In relation to physical activities, participants' behaviours fell into two categories: those who developed exercise routines and those with limited exercise or who maintained physical inactivity.

Developing exercise routines. Most of these Chinese participants had incorporated some form of exercise routine into their lifestyles following their diagnosis. The most commonly mentioned exercise was walking more than 1 h daily, followed by group activities including Tai Chi, square dancing and playing ball games in their neighbourhoods or at Chinese community centres. Having enough time following their retirement served as a facilitator for building up participants' exercise routines. Moreover, getting connected with the Chinese community and joining their activities helped participants improve their awareness, knowledge and practices on regular exercises. Alongside the adoption of exercise routines, several participants described how they considered the appropriate intensity for their physical activity, out of concern that it could have

a negative impact on their cardiovascular condition, inducing angina. Not to over-exert themselves, they tailored their exercise, avoided strenuous exercise or changed previous running habits to gentle walking or Tai Chi.

I also pay attention to the level of physical activities, neither too much nor too less. Because the beating heart pumps out the blood whenever you walk a step. So you can't walk too much or too less

(P8, male, 71yrs, CHD 6 yrs).

Limiting exercise or maintaining physical inactivity. However, some participants lacked motivation to exercise or did not prioritize exercise as an important element in self-care of heart disease, either limiting their exercise or deliberately maintaining a low level of physical inactivity. They gave various reasons for this. Four participants reported experiencing symptoms of arthritis and angina pain which dampened their motivation for regular exercise. Living at a distance from an exercise group activity was another impediment. One female participant who had lost her partner became physically inactive due to lack of motivation and related depression. Another female participant complained that between her caregiving role and her housework, she had no time to exercise.

I used to go to the park in the morning. The two of us (with husband) would walk together, do some exercise and have a chat. (after her husband had passed away) Now, I enjoy staying at home, as it is nice and quiet

(P15, female, 69yrs, CHD 2yrs)

In terms of exercise ... I rarely run nowadays, even though my doctor advised me...I told my doctor that I was afraid to run. Do you know why? I have, I had arthritis in both of my knees... So, I cannot run

(P16, male, 76yrs, CHD 7yrs).

Medication adherence

Participants' medication adherence behaviours fell into three categories: in relation to prescribed western medicine, in relation to use of Traditional Chinese Medicine (TCM) and to self-administration of health supplements.

Adherence to prescribed western medication. Three-quarters ($n=15$) of these Chinese participants reported being reasonably consistent in taking their prescribed western medications most of the time. Many participants had well-established medication routines, with specific scheduling timetables for taking medication, assembling medication in advance and taking medications with them while travelling. The social status of health professionals in China was described as very high, so even where they harboured doubts about the medication, participants still complied with physicians' prescriptions. This was partly out of respect for the prescriber's professional knowledge but also, given the social hierarchy distance between doctor and patient,

they were afraid to displease their doctors. For some participants, the need they perceived to manage their disease and control symptoms motivated their medication adherence.

I just thought, as a patient, all I could do is listen to my doctor and take my medications. That is it
(P19, female, 67yrs, CHD 1 yrs).

I just take it more seriously than I used to. I did not have cardiovascular disease in the past, so I did not take it seriously. Now that I have it, I take my medications regularly
(P2, male, 68yrs, CHD 4yrs).

By comparison, four participants confessed to poor adherence to prescribed western medications. Some considerations could dampen participants' motivation for medication adherence. These included where deliberate choices were made in respect of self-appraisal of symptoms or concerns about side-effects; where there was genuine uncertainty about what they should be doing due to inconsistent opinions between physicians; and where they were affected by the psychological burden and overload of multiple medications to take in a day, leading to forgetfulness.

Oh dear, I always forget (laughing). I take my medications when I feel unwell. I stop when I am well again
(P7, female, 67yrs, CHD 33yrs).

Use of Traditional Chinese Medicine. Over one-third reported incorporating TCM to manage their heart disease, including traditional herbal medicine, Chinese patent medicine and food therapy. In particular, they identified the use of a fast-acting heart rescue pill, a Chinese patent medicine, as a first-line medication for relieving angina.

Nitroglycerin does not work for me. I carry a different medication which I brought from China, called fast acting heart rescue pills. It is traditional Chinese medicine. But because it works so well, I really trust it
(P16, male, 76yrs, CHD 7yrs).

Influenced by the belief that, as TCM was natural it would therefore have less side-effects, some participants preferred TCM to treat their heart disease. Compared to western prescribed medication, the effectiveness of TCM for relieving angina as proven by their own experiences was another reason to take it. For other participants, as their heart disease was diagnosed in China before migrating to Australia, they had been taking the TCM prescribed by physicians in China for a long time, and continued even now they were in Australia.

One was called (XXXX). I am still on it, since it can keep (my heart rate) above 50. But it is traditional

Chinese patent medicine, which is not available here. So (maintaining consistent supply)... is what I am most worried about (laughing)

(P3, female, 63yrs, CHD 14yrs).

Self-administration of dietary supplements. In addition to their prescribed Western medications and TCM, over half the participants reported taking dietary supplements. The most commonly used supplements for heart health were coenzyme Q10 and fish oil. Only one participant received a prescribed supplement: all other participants self-administered supplements recommended by their friends or family. Some believed these dietary supplements were especially beneficial for promoting their heart health and managing heart symptoms.

I have been taking it (Q10) for more than 10years, without stopping it... No matter whether they are helpful, I think, at least they take a bit effect, rather than no effect at all...it protects the heart health. It helps in regard to the cardiac troponin
(P8, male, 71 yrs, CHD 6yrs).

Stress management

Many of these participants stated they were more likely to manage their stress on their own, rather than seek professional support. Their well-developed personal values and cultural philosophies, such as living in the present, thinking positively and letting thoughts go, supported their capacity to cope with stressors. For some participants, practices such as self-distraction or keeping busy with reading, travelling, gardening, watching TV or enjoying foods were helpful for managing their stress levels. Other participants sought emotional support from family, Chinese community centres and psychological consultations. Some participants emphasized the importance of joining group activities held at Chinese community centres to alleviate their loneliness. However, three participants claimed that they just endured stress as they did not know how to address their emotions appropriately.

It feels lonely being here. We, old people, do not speak any English, and we know nothing here. So, I feel there is a need for me to adapt to the environment here (in Australia), if you live here. I have no choice. So, I only can go out every day and participate in all sorts of activities (at the community centre), even though I had never tried them before
(P3, female, 63yrs, CHD 14yrs).

Medical follow-ups

Most participants consistently visited their general practitioners or cardiologist for regular follow-up visits. However, participants reported factors which could potentially dampen their motivation for regular follow-up care. These included problems with previous care, such as where they had received differing opinions about

their treatment from different providers; where their treatment was changed when they transferred from care under one system to another; where they experienced poor therapeutic rapport with their physician. They could also defer follow-up when they self-appraised their symptoms did not require attention; for example, one female participant perceived no need to attend the cardiologist follow-up if she had no symptoms.

Seeking health information

Seeking heart health information or resources is a common and essential behaviour in relation to self-care maintenance but was experienced variously among these Chinese Australians. Most participants sought heart health information written in Chinese. They searched for health information on Chinese websites, news feeds and WeChat (popular social media in China), and by (less commonly) connecting to social networks both in Australia and China. Participants also read printed health information in Chinese versions, either sourced locally in Australia or brought from China. Attending health talks held at Chinese community centres was reported by one participant as a way to access heart-related health information. However, a small number of participants demonstrated passivity by not reporting any effort to seek out heart-related health information. Their only channel for health information was their general practitioners who normally had little time to provide detailed health education, resulting in poor heart health literacy among these patients.

Participants frequently expressed a desire for more heart health information to support their self-care decision-making and skills. Two main barriers were encountered by these Chinese Australian participants when seeking heart health information. First and most commonly, over half the participants described a lack of access to culturally and linguistically appropriate heart health information from mainstream health services, and they had not received targeted health education from either their general practitioner or cardiologist.

First of all, I do not know what I should pay attention to in my daily life. For example, do I need to take care of my mental wellbeing, such as controlling my anger? Secondly, about my diet, I know I should avoid food high in cholesterol, but I do not know what particular food I am supposed eat in moderation, and what I should eat more. Then, there is exercise. So, at this stage, I need some very clear and specific recommendations on how I should look after myself as a cardiac patient, in terms of emotional wellbeing, diet, or lifestyle

(P2, male, 68yrs, CHD 4 yrs).

Secondly, where these participants had received health education and guidance, what was provided by health practitioners

was described as generic, too broad, not taking account of their individual circumstances. Accordingly, they wanted individualized heart health information to assist them in maintaining their self-care practices.

The doctor suggested I go for a brisk walk for 30 minutes every day. I was not able to follow that advice, because of my knee problems. They hurt when I walked for too long. And I also did not want any further damage done to my knees, so I avoided exercising too much

(P17, female, 68yrs, CHD 6yrs).

Other self-care maintenance behaviours

A small number of participants also described other behaviours, with four emergent sub-categories of sleep and rest patterns, drinking and smoking behaviours, flu vaccination and avoiding triggers for disease symptoms.

Sleep and rest patterns. Some participants reported sleeping well at night, and half the participants had developed the habit of taking a nap after lunch. However, many found it a challenge to maintain good sleep quality as they complained of broken sleep, only sleeping lightly and having disturbed sleep because of comorbidities such as joint pain and sleep apnoea. Two participants attributed their insomnia to addictively playing on their smartphones at night.

Drinking and smoking behaviours. Following their heart disease diagnosis, some participants who reported previous drinking habits had adjusted to drink only very occasionally, and in small or moderate amounts. One male participant who had smoked for 30 years complained that it was impossible to quit smoking over-night so he cut down to six or seven cigarettes from one pack a day. Another female participant was affected by second-hand smoke from her husband, a heavy smoker who refused to follow her suggestion of smoking cessation.

Flu vaccination. More than three-quarters of participants complied with their general practitioners' recommendation of annual flu vaccination. A few were reluctant to be vaccinated on the basis of personal beliefs indicative of poor health literacy on flu vaccination.

Being vigilant to avoid triggers of angina. Seven participants reported being vigilant to avoid triggers for angina or cardiac events, such as physical exertion, dehydration and heavy workload. Another participant emphasized the weather or temperature change, which he believed was related to blood circulation. The cold temperature could negatively impact the blood supply to his heart, so he put on more clothes in winter to keep warm to improve circulation to his heart.

3.2.2 | Theme two: Self-care monitoring

As recounted by these Chinese participants, four major monitoring activities were identified, encompassing interpreting bodily symptoms, monitoring signs, medications and weight.

Interpreting bodily symptoms

Chinese participants were vigilant to somatic changes, interpreted the symptoms and understood the seriousness with regard to episodes of angina or stroke. When asked what symptoms they believed may relate to their heart problem, many participants (80%) mentioned chest tightness, palpitations, shortness of breath, dizziness and fatigue in the context of physical exertion and negative emotions. Two participants with previous stroke voiced their anxiety that feelings of numbness indicated another episode of stroke.

For example, numbness in my hands and feet, or my fingertips. That usually makes me worried if I had another stroke

(P18, female, in 40s, Stroke 1 yrs).

Atypical angina symptoms were also pinpointed by some participants, including tingling on the skin surface around the chest area, shoulder or armpit pain, feeling very hungry and generally feeling unwell.

The feeling that I had to eat something immediately was quite urgent, as if I was starving. Then, I was sweating as well. I felt so tired that I had to sit down... sometimes experienced dull pain in my arm at about 5 or 6am...However, the pain spot varied each time

(P19, female, 67yrs, CHD 1 yrs).

Checking bodily signs

Most participants reported being compliant to attend for medical testing, predominantly blood tests and exercise stress tests. Many participants were vigilant to detect their weight changing and tracked their weight fluctuation over time. Approximately half of these participants actively checked their own blood pressure, blood sugar and clotting results at home on a daily or weekly basis in addition to attending medical check-ups. Four participants checked these body signs only when they felt unwell. Three participants did not monitor their body signs at all as they relied on medical examinations or perceived there was no need to check their 'normal' body signs. Not having a blood pressure monitoring device available at home was reported by one participant as deterring her self-monitoring behaviour.

...I do not monitor my blood sugar at home, because it has always been normal... But my GP did ask me to buy a blood pressure monitor...So, I have to wait for my daughter to buy one for me, as I cannot speak English

(P17, female, 68yrs, CHD 6yrs).

Medication monitoring

Over half the participants reported being vigilant to monitor medication effectiveness and detect side-effects using their somatic awareness, medication knowledge and personal experience. For example, when they took prescribed cardiac medications, they watched their bodies' reactions by self-measuring their heart rate and blood pressure. They used their knowledge of the common side effects of specific drugs; for example, muscle weakness or aches associated with statins. Participants on antiplatelet and anticoagulant medications closely checked for bruising and bleeding, and monitored their International Normalized Ratio (INR) blood test results, as instructed by their prescribers.

I was on aspirin...I took one tablet every day and some bruises appeared in different areas... So, I was worried. I asked the doctor if I should stop taking it because some people told me about (the side effects). And I showed him (the bruises)

(P3, female, 63yrs, CHD 14yrs).

3.2.3 | Theme three: Self-care management

Three self-care management behaviours were identified, involving angina, bodily signs and medication management.

Angina management

During an angina episode, the common management strategies reported by over half the participants included resting immediately and taking nitro-glycerine or quick acting heart rescue pills (TCM) if the angina symptoms persisted. For some participants newly diagnosed with CVD or presenting with mild or atypical symptoms, their response was to tolerate and observe the symptoms, anticipating that the episode would resolve without intervention. Relaxing, talking with their family or eating something to relieve hunger symptoms were also performed to relieve the angina-related symptoms and stress. However, two participants with insight into the acuity of their heart condition called their family to send them to hospital immediately.

In the bedroom, I felt difficult to catch a breath... However, when I laid in the bed, it made me feel short of breath. I started feeling choked. Then I sat up right away and took one nitro-glycerine. I still felt bad after I took the nitro-glycerine. My son was at home back then, I said to him: "let's go to the hospital as I am feeling unwell." So my son drove me to (hospital name)

(P8, male, 71 yrs, CHD 6yrs).

After an angina episode, some participants recognized the need for a review and made an appointment to consult their doctors. Others waited until the next follow-up. Notably, one participant sought reassurance from her family for her angina-related symptoms.

Bodily signs management

When changes were detected in bodily signs such as measurements of blood pressure, blood sugar or INR results, participants reported actively visiting their general practitioners for professional consultations. However, sometimes some participants adjusted their medications without consulting their doctors. Interestingly, one participant used his blood pressure records to indicate what he thought was the best time to take medication to achieve the best treatment outcomes.

I find my blood pressure is highest at probably 5am, with 80/140 mmHg sometimes. So I take the medication to control my blood pressure at that time... So my blood pressure is well controlled

(P9, male, 73yrs, CHD10 yrs).

Medication management

In response to concerns about medication effectiveness and side-effects, some participants initiated consultations with their general practitioners. In contrast, over half the participants adjusted their medications themselves when suffering from medication side-effects, rather than communicating with their physicians in the first instance. However, one participant self-adjusted warfarin with their physician's permission as she knew how to adjust the dose in line with her INR results. Other participants with high levels of health literacy could rationalize medication side effects, interpret their seriousness and self-manage side effects under instruction.

With dizziness, when I do some gardening in my backyard and suddenly stand up, for example, (I) may feel dizzy and need to find something to hold on to immediately. This may not be related to my heart, but blood pressure instead

(P1, male, 71yrs, CHD 6 yrs).

4 | DISCUSSION

The paper adds new knowledge by comprehensively describing self-care behaviours among first-generation Chinese immigrants with CVD in Australia, a group with a unique experience of two cultures, compared to other Chinese immigrant generations. Overall, many participants were willing to take a role in self-care for their CVD, particularly in self-care maintenance (e.g. adjusting to a heart-healthy diet, exercising regularly and actively seeking out health services) and self-care monitoring. However, adherence to such self-care behaviours was by no means universal, and some of the practices described were not evidence-based. Although most were broadly adherent to their prescribed medication regimens, self-adjustment of medications, use of TCM and self-administration of health supplements were common practices among these populations. Of concern, how patients and families responded to acute cardiac events was suboptimal and delays could be compounded by using TCM. In

addition to personal preference and health literacy, language barriers and cultural adaptation were also important influences on self-care behaviours in these Chinese immigrants.

Participants described an accumulation of multiple sources of difficulty in adopting lifestyle changes within a context of widespread change due to migration. The challenges were acknowledged of changing lifestyle habits engrained over decades. Participants emphasized their lack of access to culturally and linguistically heart health information, and predominantly blamed this for their limited abilities to perform evidence-based CVD self-care. This could, partially at least, explain their poor self-care management response to heart attacks or angina episodes. Where they recognized the seriousness of a diagnosis of CVD, this could motivate and facilitate adoption of self-care behaviours but lack of culturally appropriate heart-health information posed a common and substantial barrier. Family could both help and hinder adherence to cardiac best practices but they suffered a similar lack of culturally and linguistically appropriate heart-health information. Further, participants wanted heart-health information that was not just culturally appropriate but tailored to take account of individual factors such as co-morbidities.

Our findings showed that many Chinese immigrants were willing to adopt a healthy diet following their CVD diagnosis. This was consistent with another study on Chinese immigrants with CVD (Jin et al., 2020). However, some participants still maintained previous poor dietary practices attributed to dietary habits, food acculturation and family obligations. Thus, it would be sensible for clinicians to assess Chinese immigrants' dietary habits and acculturation before giving dietary guidance. To improve dietary adherence, clinicians could reinforce the heart-healthy components of cultural dietary practices and encourage them to integrate dietary recommendations within the local cuisine. Moreover, it is essential to get family members involved with dietary education.

Many Chinese immigrants in this study developed physical activity routines, similar to findings of a review (Zeng et al., 2023), that this population commonly performed exercises such as walking, Tai Chi and swimming. Further, study findings showed Chinese community associations playing significant roles in promoting older Chinese immigrants with exercise routines such as Tai Chi, ball sports and dancing. Thus, community-based exercise interventions in collaboration with Chinese community managers could be developed to support Chinese immigrants with appropriate and sustained regular exercise intensity.

Whilst these immigrants reported broadly adhering to western-prescribed medications, they included TCM to manage their CVD and self-administration of heart health supplements was prevalent. Similar results were also reported in other studies from Australia and the United States (Jin et al., 2020; King-Shier et al., 2017). This may in part be due to these participants' CVD having been diagnosed and initially treated in their country of origin, which was a new finding in our study. Further, these participants were prone to self-adjust their prescribed medications when side-effects presented. Clinicians should bear these practices in mind when assessing Chinese immigrants' medication histories.

Participants' stressed their lack of access to linguistically and culturally appropriate heart health information from mainstream sources; also found in other studies exploring health information-seeking behaviours among Chinese immigrants in the United States and Australia (Qian & Mao, 2021; Zhang et al., 2023). Many participants in this study had no admission history for an acute CVD event, and thus had not received heart health education from hospitals or cardiac rehabilitation. Therefore they sought online health information from Chinese websites which were not based on or verified in line with Australian treatment guidelines. This misalignment of information was a possible source of misunderstanding and mistrust between patients and doctors, further undermining Chinese immigrants' self-care behaviours. Interventions are required to improve access to heart health education in outpatient and community settings. Consistent with a previous study (Xiao et al., 2023), Chinese immigrants heavily relied on Chinese social networks and Chinese community associations to access health information. It would be feasible to collaborate with Chinese community managers to develop and deliver heart health education programmes to engage peer and community support to improve self-care literacy and skills in this population.

Another important finding of this study was the inadequate response to heart attack or angina management in this population. This was also confirmed in a previous study, where Chinese immigrants delayed seeking treatment for acute angina symptoms due to their poor health literacy (Jin et al., 2020). Our study detailed the mechanism in response to an angina episode. They tended to use TCM (quick-acting heart reliever pills) to relieve the symptoms and were reluctant to call an ambulance due to the language barrier and financial burden. Culturally and linguistically appropriate intervention is urgently needed to improve the first response to acute cardiac events by Chinese immigrants.

This study has some limitations. First, participants were recruited solely from the Sydney area and whilst this area houses one of the biggest Chinese communities in Australia, study findings may not be transferrable beyond this location. Another limitation is in regard to the inclusion criterion that required participants to speak English or Mandarin as this excluded immigrants who only spoke Cantonese. Moreover, during the interview, participants' sense of socially desirable responses may have generated data bias. The findings in this study need to be interpreted and transferred with caution considering the differences between the health systems in the various host countries; Australian Chinese immigrants' experiences with the Australian health system may not be reproducible for other Chinese immigrant populations. Finally, the transcripts were not provided to participants for feedback due to COVID-19 movement restrictions, which might have compromised study confirmability.

5 | CONCLUSION

Most Chinese immigrants were motivated to engage in self-care behaviours for their cardiac disease, particularly in self-care

maintenance and monitoring. However, their limited health literacy and skills in CVD self-care were not adequate to enable them to fully participate in evidence-based self-care behaviours and optimize their health outcomes. This was largely attributed to the lack of access to linguistically and culturally appropriate heart health information involving not just the patients but also their families. This was echoed in their poor first response to acute cardiac events. Linguistically and culturally appropriate heart health education programmes are urgently needed among this population in the community, targeting healthy lifestyle modification, medication literacy and cardiac symptom management. Partnering with Chinese community organizations offers an innovative route to co-design and deliver targeted heart health education interventions and support for this population.

AUTHOR CONTRIBUTIONS

All authors agreed the final version of the manuscript. Ling Zeng carried out study conception, study design, data collection, data analysis, data interpretation and drafting the manuscript. Xiaoyue Xu and Lin Perry contributed to study conception, study design, data analysis, data interpretation, manuscript revision and editing.

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No conflict of interest has been declared by the authors.

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DATA AVAILABILITY STATEMENT

The data utilized in this study have been lawfully acquired. The raw data will be only accessed with participants' permission, in line with appropriate Human Research Ethics Committee approvals.

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Research Article

The Role of Acculturation in Self-Care Behaviours among Chinese Immigrants Living with Cardiovascular Disease: A Qualitative Study

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Aims. To understand what domains of acculturation are experienced by Chinese immigrants with cardiovascular disease (CVD) in Australia and how these domains of acculturation influence their CVD self-care behaviours. **Design.** A qualitative descriptive design. **Methods.** Individual phone interviews were conducted among Chinese immigrants with CVD in Sydney, recruited from Chinese Community associations and social media. Inductive and deductive thematic analysis was employed, guided by the Middle-Range Theory of Self-Care of Chronic Illness and the conceptual model of acculturation. **Results.** Twenty participants, mean age 69.9 years, were interviewed. The domains of acculturation in relation to CVD self-care behaviours encompassed cultural practices, cultural values, healthcare system navigation, and new living environment. Retaining their Chinese culture and integrating into Australian culture regarding dietary practices, social networks, traditional values and family relationships served as both enablers and barriers of self-care maintenance through factors such as heart-healthy diets, physical activity, stress management and medication adherence. Many participants denied encountering difficulties to utilize primary care services, but language barriers deterred them from accessing acute services and heart-health information from mainstream sources. Some preserved beliefs and practices in Traditional Chinese Medicine may complicate their self-care maintenance (medication adherence) and self-care management (responding to acute angina episodes). **Conclusion.** The influence of acculturation on CVD self-care behaviours among Chinese immigrants is multifaceted and individualized. Clinicians and community health workers should assess patients' acculturation experiences to enable culturally sensitive practices. The lack of culturally and linguistically appropriate heart health information in the community should be addressed urgently to mitigate the cardiac health disparity. Collaboration with Chinese community associations offers an opportunity for co-design and dissemination of information about Australian healthcare systems and heart health education to upskill CVD self-care practices and mitigate the health inequities experienced by Chinese immigrants.

1. Introduction

Cardiovascular disease (CVD) has been the leading cause of death globally for many years, and approximately 19.8 million deaths globally were attributed to CVD in 2022 alone [1, 2]. It creates enormous and growing burdens which disproportionately affect immigrant groups compared to host populations [3].

People from China comprise one of the largest and fastest-growing immigrant populations globally, and the most popular countries where Western cultures are dominant to which they have migrated are the United States, Canada, Australia, New Zealand, and the United Kingdom [4]. In recent years, many Chinese have relocated to these countries at relatively older ages through sponsorship of their adult children who migrated first. It has been widely

reported that Chinese immigrants experience disadvantageous CVD profiles, with the risks of obesity and diabetes increasing in parallel with increasing residence duration [5]. A systematic review involving 258,474 participants found greater prevalence and mortality from coronary heart disease in Chinese immigrants compared to their counterparts in China [6]. At the same time, another review and meta-analysis of data from eight cohort studies found greater short-term cardiac mortality in Chinese immigrants than in the host populations [7].

Self-care is an evidence-based practice for reducing cardiac mortality and hospital readmission and increasing quality of life [8, 9]. Based on the Middle-Range Theory of Self-Care of Chronic Illness [10], the concept of self-care compromises three key processes. Self-care maintenance refers to behaviours performed to stabilize an illness process or preserve health status, such as healthy lifestyle adaptation and medication adherence. Self-care monitoring is defined as activities taken in order to be vigilant, observing body changes such as measuring blood pressure. Self-care management entails patients' evaluation of their treatment or their response to changed body signs and symptoms. Multiple factors are known to influence self-care, including characteristics recognised as social and cultural determinants of health (for example, education level, economic status, and ethnicity), challenging patients' ability to practice CVD self-care [8, 9]. Further, the complexities of self-care practice are compounded for immigrant populations who work between two cultures, negotiating across the health beliefs and healthcare systems of both their country and culture of origin and that of their host countries.

Acculturation, a complex and multidimensional change process, occurs when two different cultures interact, resulting in various adaption forms in tandem with cultural and psychological changes [11]. To conceptualize acculturation Schwartz and colleagues [12] proposed an expanded model that could generate a comprehensive understanding of the journey of the acculturation experience. The resultant changes are explored in three domains: cultural practices (language use, media preferences, social interaction, and cultural foods), cultural values (cultural beliefs), and cultural identification (attachment to cultural group) in relation to the original culture and the host culture, respectively. Acculturation plays a significant role in immigrants' health, including the progress of CVD [13]. Robust evidence has indicated that levels of acculturation are closely related to CVD profile and disease management among immigrants [14, 15].

A clear understanding of the influence of acculturation is required to accurately describe self-care behaviours among first-generation Chinese immigrants living with CVD and to develop targeted interventions to minimize the CVD health inequities experienced by Chinese immigrants. However, a recent systematic review [16] has shown that studies of acculturation experiences in relation to CVD self-care behaviours in Chinese immigrants are scarce. Few studies distinguish Chinese first-generation immigrants from second or mixed generations, whose self-care practices may vary significantly depending on the level of acculturation

[17]. Moreover, in many papers, acculturation was examined using proxy acculturation measures such as length of residence or age at migration. This has restricted understanding of the comprehensive mechanisms of the cultural adaptation process and its influence on Chinese immigrants' CVD self-care behaviours. To address this gap, this study aimed to address two questions: (1) What domains of acculturation are experienced by first-generation Chinese immigrants with CVD in Australia? (2) How do these domains of acculturation influence their CVD self-care behaviours?

2. Methods

2.1. Design. Underpinned by philosophical assumptions of naturalism/constructivism, which generates an understanding of a phenomenon by analysing the meanings that participants ascribe to it and describe to investigators [18], a qualitative descriptive approach was an appropriate choice for this early exploratory work, capable of generating rich description of an understudied phenomenon [18, 19]. The study was reported in line with the Consolidated Criteria for Reporting Qualitative Research [20].

2.2. Study Setting and Recruitment. Participants were recruited if they met all the following inclusion criteria:

- (i) First-generation adult Chinese immigrants to Australia, born in Mainland China, Hong Kong, Macao, or Taiwan
- (ii) Australian permanent residents or citizens
- (iii) Self-reported or medically-diagnosed with CVD, including coronary heart disease, stroke, or heart failure
- (iv) Speaking English or Mandarin
- (v) Providing informed consent, excluding those with history or evidence of impaired cognition.

A combination of purposive and snowball sampling was employed to recruit participants via three primary sources: social media, Chinese Community associations, and medical centres in Sydney, Australia, between September 2021 and June 2022. Electronic recruitment flyers were distributed through social media platforms such as WeChat, the Sydney Today mobile app, and 2ac Australian Chinese Radio. The first author initially approached gatekeepers of Chinese community associations for support to disseminate electronic flyers via their social medias. After COVID restrictions were lifted in May 2022, this author circulated paper flyers in person while attending Chinese community associations' outdoor activities. Paper-based flyers were made available in reception areas at a medical centre. Initial participants were asked to pass details of the research and recommend participation to their family or friends living with CVD.

Potential participants who expressed interest in this research were invited to contact the first author via the phone number or e-mail address provided. She screened potential participants, provided a verbal explanation of the

research, and sent electronic participants information sheets to eligible participants. The dates and times for the phone interviews were agreed with participants.

2.3. Data Collection. The first author interviewed participants in their preferred language (Mandarin) and aimed to create a warm and nonjudgemental environment for the interview. Participants consented to audio-recording the interviews and the author took field notes during the process.

A semistructured interview guide was drafted, informed by the Middle-Range Theory of Self-care of Chronic Illness [8, 10] and the conceptual model of acculturation [12]. This was discussed and revised among the author group and piloted with volunteers whose data were not included in the study analysis. The interview started with collecting participants' demographic and clinical data, followed by open-ended questions with probes concerning their CVD self-care behaviours, acculturation experiences and how these unique experiences influenced their self-care behaviours (Supplementary Table 1). Recruitment and interviews continued until data saturation was achieved; that is, until no new information emerged during interviews [18]. No repeat interviews were carried out.

2.4. Data Analysis. The audio files were transcribed verbatim in Mandarin by the first author [21]. Following Twinn's [22] method to improve the consistency and reliability of data translation in cross-language interview studies [23], transcripts were independently translated into English by professional translators, and then validated by bilingual researchers in this author group. English-translated transcripts were imported into NVivo 12 software for data analysis.

The first author immersed herself in the data set through repeatedly listening to the audio recordings for transcription, translation, validation, and coding analysis. Deductive and inductive thematic analysis was employed [24], with a predetermined list of codes developed based on the Middle-Range Theory of Self-Care of Chronic Illness with the related self-care inventory proposed by Riegel et al. [25], and Schwartz et al.'s [12] conceptual model of acculturation. Additional codes were generated by reading the transcript line-by-line and coding for topic content. Coding and findings were progressively checked and discussed within the author team.

2.5. Ethical Considerations. This study was approved by the Human Research Ethics Committee at University of Technology Sydney with registration number ETH21-6096. Informed consent was obtained from all individual participants included in the study.

2.6. Rigor and Flexibility. Grounded in trustworthiness criteria proposed by Lincoln and Guba [26], credibility was ensured by author team's ongoing engagement in data collection and analysis. Peer-debriefing meetings were held regularly to check on the research process. Thick description of study participants and the context of the research were provided to establish transferability. In terms of

dependability and confirmability, data transcription, translation, and analysis were conducted independently and checked by team members. Any discrepancies during these processes were addressed among the research team. An audit trail was recorded during the whole process. The researchers explored their attitudes toward the topic and findings to avoid personal bias and further create confirmability. The first author, who collected and coded the data, is a registered nurse and a bilingual researcher certified by the National Translation Accreditation Authority. She identifies as from the same cultural background as these participants. She understood some local dialects and cultural health beliefs and practices, which facilitated the conduct of the interviews. The author had no contact with any participants before the research project and holds no-judgemental attitudes toward the interview and data analysis process.

3. Results

3.1. Participant Characteristics. Telephone interviews (mean duration: 63.6 minutes, ranging 35.9 to 135.2 minutes) were conducted with 20 Chinese Australian participants. There was no drop-out from recruitment. The mean age of 19 participants was 69.9 years. The majority of participants were female (60%); most had migrated to Australia at a relatively older age (mean 55 years), following their retirement in China, and had lived in Australia for mean 14.4 years. All had limited English proficiency and half were privately medically insured. The majority (90%) were married and lived with a partner or extended family (Table 1). Most participants reported a diagnosis of coronary heart disease while three had experienced stroke. Some (30%) were diagnosed in China before moving to Australia. Many (60%) had been living with CVD for more than three years and for most (80%) their CVD was predominantly managed conservatively with prescribed medical treatments (Table 2).

3.2. Acculturation Experiences in Relation to Self-Care Behaviours. Acculturation experiences influencing CVD self-care behaviours were organised into four major themes: cultural practice and self-care, cultural values and self-care, healthcare system utilization and self-care, and new living environment and self-care. Within each theme, subthemes specified each domain of acculturation (Table 3). Theme 4 is a relatively small domain of acculturation experiences in relation to CVD self-care. Due to limited interview data in this dominant, the theme is not expanded with subthemes.

3.2.1. Theme One: Cultural Practices and Self-Care. Participants' self-care behaviours, especially self-care maintenance, were intertwined with cultural practices, predominantly dietary practices, social networks, language, and media preferences.

(1) Dietary Practices. Dietary patterns comprised a significant component of acculturation experience. How these immigrants adapted to a new culture was influential for their dietary behaviours. Participants' dietary acculturation

TABLE 1: Participants' demographic characteristics (n = 20).

Characteristics	Mean (SD) (N)	Range (%)
Age (years)	69.6 (4.7)	61–79 40–45
Age at migration (years)	55.0 (12.4)	32–73 30–35
Length of Australia residence (years)	14.4 (11.8)	2–42
Sex		
Male	8	40
Female	12	60
Language spoken at home		
Mandarin	17	85
Cantonese or dialect	2	10
English	1	5
English proficiency		
Poor	9	45
Basic	9	45
Good	2	10
Education level		
<High school	2	10
High school	6	30
Some college/technical school	5	25
Bachelor	7	35
Marital status		
Married	18	90
Divorced	1	5
Widowed	1	5
Living status		
Alone	1	5
With partner	11	55
With partner and young children	4	20
With extended family	4	20
Employment status		
Part-time	1	5
Full-time	1	5
Unemployed	1	5
Retired	17	85
Private insurance cover	10	50

One participant only reported her age in this range.

experiences were categorized as retaining cultural dietary habits and/or integrating into Australian dietary culture. Both dietary acculturation experiences served to facilitate or deter adherence to a heart-healthy diet: an essential component of CVD self-care maintenance.

(1) **Retaining Cultural Dietary Habits.** There was consensus that participants preferred Chinese cuisine, irrespective of their duration of residency. They reported that they were accustomed to Chinese foods and that it was hard to change their taste preferences and cooking style. For example, heavily salted and spiced dishes were prominent in some parts of China, and participants from these locations found difficulty adapting to low-salt dietary recommendations. Cantonese participants held cultural dietary beliefs about the nutritious value of meat stew and its benefits for health and disease recovery, despite that one participant reported that it increased her cholesterol level. In Chinese culture, food functions not only to preserve life and health but also for the joy of

TABLE 2: Participants' CVD related clinical characteristics (n = 20).

Characteristic	N	%
CVD diagnosis		
Coronary heart disease	17	85
Stroke	3	15
Diagnosed following:		
Health check	9	45
Presenting symptoms	11	55
Duration of CVD diagnosis (years)		
≤1	1	5
>1 and ≤3	7	35
>3 and ≤10	10	50
>10	2	10
Place of CVD diagnosis		
Mainland China	6	30
Australia	14	70
CVD risk factors		
Hypertension	6	30
Hyperlipidaemia	14	70
Hyperglycaemia	1	5
Family history	6	30
Smoking	3	15
Depression	1	5
Other	3	15
Initial treatment		
Lifestyle intervention	1	5
Conservative medication therapy	16	80
Thrombolysis	2	10
Coronary artery bypass graft operation	1	5
Recurrent hospital admission		
No	16	80
Yes	4	20
Number of chronic conditions		
None	3	15
1	11	55
2	4	20
3+	2	10

CVD: cardiovascular disease.

living, perceived as conveyed by their customary diets. Consequently, some participants were unconcerned about heart-healthy diets, which deterred adherence to dietary recommendations.

"But sometimes I can't change my dietary habit. First, people who come from Wuhan prefer salty and spicy food. I lose my appetite if the food is not salty and spicy" (P9, male, 73yrs, residence 10yrs, CHD10 yrs).

Nevertheless, cultural dietary habits did not always deter adherence to recommended diets. Participants from some parts of China preserved culturally determined light eating patterns, such as using less salt and oil for cooking, simplifying adherence to heart-healthy diets.

(2) **Integrating into Australian Dietary Culture.** Despite maintaining Chinese cuisine, most participants had, to some extent at least, integrated into Australian food culture. Breakfast was the first meal to change

TABLE 3: Participants' acculturation experiences in relation to CVD self-care behaviours.

Themes	Subthemes	Acculturation experiences	Self-care influenced
Cultural practice and self-care	Dietary practice	(i) Retaining cultural dietary habits (ii) Integrating into Australian dietary culture	Self-care maintenance enablers and barriers
	Social networks	(i) Coping with the separation from overseas social networks (ii) Establishing new community ties	Self-care maintenance enablers and barriers
	Language use and media preference	(i) Accessing healthcare systems (ii) Seeking heart health information	Self-care maintenance enablers and barriers
	Traditional values	(i) Retaining traditional values (ii) Adjusting to Australian values	Overall self-care barriers
	Family relationships	(i) Retaining traditional family ties (ii) Adjusting individualism	Self-care maintenance, monitoring and management enablers and barriers
	Medical service navigation		Overall self-care enablers
	Patient and doctor interactions		Overall self-care enablers
	Traditional Chinese medicine		Self-care maintenance and management barriers
	Financial issues including health insurance		Overall self-care enablers and self-care management barriers
	New living environment and self-care	Good air quality, weather temperature, food safety	Overall self-care enablers

postmigration, with most partially or entirely adopting a Western-style breakfast (such as milk, cereals, and bread). Collectively, participants increased their consumption of vegetables, fruits, seafood, dairy products, eggs, and wholegrains following migration, attributing this to their local availability, affordable prices, and food safety in Australia. Some reported being accustomed to eating salads and tasting local vegetables as they believed these foods were healthy. This dietary acculturation facilitated their adaptation to heart-healthy dietary recommendations.

"There must be some changes (in my diet). For example, I did not eat carrots that much when I was in China. After coming here, I started to eat more carrots. Broccoli is another example... Avocado is available here, not in China" (P3, female, 63yrs, residence 8yrs, CHD 14yrs).

Conversely, a few participants adopted some local dietary behaviours that did not align to recommendations, such as "fast food" (e.g., pizza and burgers), bakery goods (cakes and pastries), and lollies (sweets). One participant who previously loved eating fish changed to eat more red meat as it was much cheaper in Australia.

(2) Social Networks. Social networks, a second domain of acculturation experience, can reflect the extent to which immigrant participants have adapted to a new cultural community, including coping with the separation from overseas social networks and establishing new community ties. Networks mainly influenced participants' self-care maintenance of their CVD in relation to dietary practices, physical activity, stress management, and medication adherence.

(1) Coping with Separation from Overseas Social Networks. Separation from previous social networks in China was both a driver and constraint to engaging in self-care. Some participants talked of how, in China, complicated social relationships and collectivist social norms could put a lot of strain on people to prioritise others over their own needs. Some felt greater peace of mind after moving to Australia and living a simpler social life, which was seen as beneficial for stress management. Engaging with fewer social activities and meal gatherings in Australia made it easier to take medication on time and follow a heart-healthy diet.

"Whether it is my (heart) condition or any other disease, patients need good rest to help with their recovery or disease management... I had many friends and relatives there (in

China). They needed my help with all sorts of things, which kept me busy... So, I had more stress. Too much stress and socialising are not good for my health" (P17, female, 68yrs, residence 5yrs, CHD 6yrs).

Following their migration, some participants still actively maintained overseas social networks which they used to seek heart health information and emotional support. However, such recommendations could include encouragement to take TCM or health supplements to manage their heart condition, which could negatively affect their prescribed medication regimes.

(2) Establishing New Community Ties. Many participants moved to neighbourhoods that were ethnic enclaves, actively sought Chinese community centres, and joined Chinese group activities. These new social networks provided a means to share their experiences of acculturative stress and mitigated their feelings of social isolation, which assisted them to better manage their stress. Membership of Chinese community centres supported participants in CVD self-care, for example, by taking part in regular group exercises such as dancing, Tai Chi, and table tennis, and peer support for adherence to exercise recommendations. Some reported that attending health talks in the community centre and exchanging health information with friends there motivated them to adopt a healthy diet and improved their self-efficacy to manage their heart disease.

"I have found a... art group... They are all Chinese so that we can have a chat and do activities together, such as singing, dancing and playing instruments. I am happy with that" (P16, male, 76yrs, residence 3yrs, CHD 7yrs).

(3) Language and Media Preferences. The first settlement challenge reported by almost all participants was a language barrier. It shaped their ways of accessing healthcare and seeking heart health information in Australia, which are essential aspects of CVD self-care maintenance.

(1) Accessing Healthcare Systems. Almost all participants denied that language was a barrier in seeking primary and cardiologist services because they proactively sought Chinese-speaking physicians. When they encountered an English-speaking physician, their adult children interpreted for them, or they used a health service interpreter. By contrast, inability to converse in English was a significant deterrent to accessing ambulance and hospital services, which reduced participants' self-efficacy for managing acute cardiac events.

"We do not speak English... What if I need an ambulance due to my heart condition or when something else goes wrong? That kind of situation worry me. If I were in China, because I speak the language, I could call an ambulance right away, or go to the hospital" (P3, female, 63yrs, residence 8yrs, CHD 14yrs).

- (2) Seeking Heart Health Information. Language barriers also blocked participants' access to heart health resources and information from mainstream healthcare services and media. Many participants lacked heart health knowledge to support their self-care *decision-making and skills*. They searched for health information in Chinese via Chinese media (websites, social media, apps, and books) and ethnic social networks. However, the health information they accessed was not necessarily scientifically verified and could be "folk medicine"; some advice clashed with Western treatment recommendations and could be detrimental to their treatment adherence and overall self-care behaviour.

3.2.2. Theme Two: Cultural Values and Self-Care.

Traditional values and family relationships were strong influences on participants' CVD self-care behaviours in self-care maintenance, self-care monitoring, and self-care management.

(1) Traditional Values

- (1) Retaining Traditional Values. Most participants had retained traditional values postmigration and many referred to or indicated that these were based in religious or philosophical principles, such as Buddhist, Taoist or Confucian thought, which they had grown up with. Half the participants endorsed Buddhist values that encourage people to let go of worry and live in the present; these values enabled participants to manage their daily stress and shaped their illness perspectives. For example, after being diagnosed with heart disease, these participants quickly accepted this and actively engaged in treatment and CVD self-care rather than worrying about the disease. High importance was placed on keeping a peaceful mind in Taoist philosophy, which was embraced by some participants to achieve emotional stability for promoting their heart health.

"Anyway when the disease comes... I just accept it and adapt to it... I just followed the doctors and did whatever they suggested. If I had spare time, I sometimes sought heart-related health information... I didn't feel stressed when I knew I had a stroke" (P10, female, 64yrs, residence 32yrs, stroke 8yrs).

Confucianism beliefs see the experience of pain as a part of life that a person should endure unless it becomes unbearable. However, this value could conflict with self-care management recommendations for heart

symptoms. One participant reported enduring palpitations at work without taking any action to manage the symptom. Also, the characteristics of reserved emotion in Chinese culture prevented participants from accessing psychological support services to manage their stress.

"Actually, I wanted to see a psychologist very early on. However, you know, Chinese people are reserved by nature. That is our tradition. We do not like to talk about our feelings with others" (P3, female, 63yrs, residence 8yrs, CHD 14yrs).

- (2) Adjusting to Australian Values. Although many participants initially denied any changes regarding cultural values, further exploration revealed that some participants had incorporated some Australian individualistic perspectives into their postmigration lives. Participants reported being able to prioritise their individual health needs by restricting and simplifying their social responsibilities and slowing the pace of their lives in Australia. They praised Australia's relaxed lifestyle, which contributed to their emotional well-being and enabled better self-care of their heart condition.

"It is not like China where I had to be concerned about everything that I needed to deal with. I was exhausted but had no choice, because it was my responsibility to handle it. Here is much simpler... not stressed out. I should take care of myself and try to relax" (P4, female, 65yrs, residence 6yrs, CHD 4yrs).

(1) Family Relationships

- (1) Retaining Traditional Family Ties. Collectivism lies at the centre of family relationships in Chinese culture. Traditional family values, retained by most participants, were a powerful influence on their heart disease self-care behaviours. In keeping with the collectivistic culture they had grown up in, participants prioritized family over individual needs, which could make self-care of their heart disease difficult. For example, one female participant was dedicated to caring for her husband who lived with chronic disease, and explained that this meant she had no time for regular exercise. For many participants, their ability to follow dietary recommendations depended on the dietary habits of their family members. Where participants were responsible for preparing the family food, some had to prioritise their family taste preferences.

"It is challenging for you to ask all of them to follow a low-fat, low-salt diet to meet your nutritional needs. It is just not realistic. All of them love meat, including my

grandchildren. I actually have to consider their preferences when I cook” (P16, male, 76yrs, residence 3yrs, CHD 7yrs).

Filial piety is a value deeply rooted in Chinese collectivistic culture. Receiving filial piety from adult children was a protective factor for participants’ emotional well-being. Some adult children with solid values of filial piety were actively involved in their parents’ heart disease management, including supervising their recommended diet and exercise, obtaining medications, making disease-related decisions in response to symptoms, and providing language interpretation to access health services. However, some adult children were only weakly adherent to filial piety. Family conflict could arise from intergenerational discrepancies in filial piety-centred family values, resulting in emotional distress and social isolation in some participants, further undermining their emotional well-being.

We would like to live together, and I can ask him if I need help. I do not speak English and know nothing about this country... So, it makes sense that I hope to live with my son. Right? ... (But they live separately) Of course, I was really not happy (sobbing) (P3, female, 63yrs, residence 8yrs, CHD 14yrs).

Most participants stressed that individuals assumed responsibility for managing their heart disease, which echoed the collectivist value of not burdening the family. This encouraged participants to take an active role in their self-care behaviours. Nonetheless, although participants internalised responsibility for managing their heart disease, many family members were also actively involved in this, predominantly in supporting heart-healthy diets, adhering to medications, avoiding strenuous activities, and making decisions on symptom management.

She (wife) may ask me: “Have you taken your medications today? Have you had it or not?” Or she may say: No, it has too much cholesterol. Don’t eat that. “Things like this” (P2, male, 68yrs, residence 33yrs, CHD 4yrs).

(2) Adjusting to Australian Individualism. Following migration, some participants reported that their high expectations of filial piety in their children were in transition. To reconcile or avoid family conflicts, these participants slowly adjusted to the individualistic cultural values espoused by their adult children and learned to live independently. Achieving this change mitigated their emotional distress and motivated them to engage in heart disease self-care.

“If I had lived with him and his family all the time, I do not think my health could have handled it. It is just too much. I actually enjoy living on my own. Nobody tells me what I should do... Now, I do not always put their interests first. My generation makes sacrifices all the time” (P15, female, 69yrs, residence 13yrs, CHD 2yrs).

3.2.3. Theme Three: Healthcare Systems Utilization and Self-Care. Being able to access and make use of healthcare services in their adopted country was an integral aspect of these Chinese immigrants’ acculturation experience and shaped their overall self-care practices for heart disease. Participants’ recollections of adapting to the new healthcare system in Australia were categorized as: navigating medical services, patient and provider interactions, traditional Chinese Medicine (TCM), and financial issues including health insurance.

(1) *Navigating Medical Services.* Many participants felt they had adapted to their new healthcare system. They actively sought access to primary care medical services to manage their cardiac medications and symptoms, and attended cardiologist clinics. However, some participants experienced difficulties using medical services due to unfamiliarity with the healthcare system. They largely relied on general practitioners to access allied health services.

Several participants compared their experience of the Chinese healthcare system, where they could book to see a cardiac specialist directly, to the referral system and long waiting times in Australia, which were significant barriers to accessing specialist and hospital services that could result in unmet health needs. For example, one participant self-adjusted his cardiac medication as he was told he was not eligible for a specialist referral for medication consultation. In another example, the need to take up a general practitioner’s time just to obtain a referral deterred one participant from seeking a specialist consultation for her worsening heart condition.

“I felt awful, especially after midnight... I need to see my GP and get a referral before making my appointment with a cardiologist. However, I personally felt that I did not want to bother my GP, so I decided to skip my appointment. I did not see my GP for my heart condition” (P17, female, 68yrs, residence 5yrs, CHD 6yrs).

Consequently, some participants turned to TCM practitioners in Australia or returned to China, for cardiac medical services, which could discourage adherence to Australian prescribed treatments and limit self-care engagement.

By contrast, some participants had high praise for Australian health services, referring to the high quality of patient-centred care culture, triage system in the emergency department (ED) and culturally appropriate care, to which they attributed their overall self-care engagement. For example, heart disease was prioritised in ED in Australia, which cleared barriers to participants seeking medical services in response to their acute heart condition. One participant attributed his well-controlled blood sugar to his dietitian’s culturally customised dietary recommendations.

“What he said was: Stay away from rice, flour and sugar... Take staple food as an example. We used to have white rice every day. Now, we eat whole grains. We mix rice with coarse grains” (P13, male, 75yrs, residence 16yrs, CHD 2yrs).

(2) Patient and Provider Interactions. Interactions with healthcare providers (HCPs) were critical to Chinese immigrants' healthcare experience and exerted important influence on their cardiac self-care maintenance and monitoring. Many participants reported positive experiences interacting with HCPs. This was linked to the authority and prestige of HCPs in Chinese culture. The professional ethics of HCPs were highly valued by many participants, and this valuing facilitated development and continuance of therapeutic relationships and treatment adherence, including for medications and follow-up appointments.

"My rule of thumb is, listen to doctors. Don't you think so? Try your best and then follow medical advice. And that is it (laughing)" (P13, male, 75yrs, residence 16yrs, CHD 2yrs).

Some participants reported higher satisfaction with interactions with HCPS in Australia than in China, which they linked to the focus on patient empowerment and shared decision-making. This enabled them to take the initiative in monitoring their heart disease and managing its symptoms, prioritising adherence to prescribed medication regimes and attendance at regular follow-up appointments. For example, some participants closely monitored their blood pressure and consulted their HCPs for medication adjustment.

"My blood pressure is not well controlled with this medication. I talked to my doctor ... (they) changed my hypertensive medication to a new one" (P10, female, 64yrs, residence 32 yrs, stroke 8yrs).

(3) Traditional Chinese Medicine. Traditional Chinese Medicine (TCM), rooted in Chinese culture, could also have an important influence on self-care maintenance. Although they took prescribed Western medications, half the participants embraced TCM beliefs and practices. In TCM, emotions and physical health are intimately interrelated. Participants believed that maintaining a positive attitude was beneficial for their heart disease recovery, and they attached great importance to maintaining emotional well-being.

"You are in a good mood when you go outside and have fun. It is hard to get depression in Australia. Without depression, doesn't your heart feel comfortable?" (P8, male, 71yrs, residence 3yrs, CHD 6 yrs).

By contrast, some TCM beliefs served as barriers to participants engaging in self-care maintenance and management. For example, some participants endorsed the TCM belief that bed rest is essential for patients with heart disease to recover, which contradicted exercise recommendations. One way to accommodate these contrasting recommendations was through Tai Chi. An accepted part of TCM, Tai Chi was a culturally acceptable physical activity that could provide participants a route to establish exercise routines.

Another element of TCM involved herbal medicines. Regarding them as efficacious and harmless, over one-third reported taking herbal medications to manage their heart

disease, and one-quarter used them as first-line medications for relieving angina. These experiences and perceptions regarding herbal medicines could hinder adherence to Western medication regimes and complicate their cardiac self-management. Firstly, the CVD treatment processes and clinical practice guideline recommendations in Australia are different from China, where integrating TCM and western medication in treating CVD may be common practice. This inconsistency can generate misunderstanding and distrust between clinicians who follow CVD practice guidelines in Australia and Chinese patients retaining beliefs and practices in TCM, further compromising therapeutic relationship and adherence.

"He (Australian doctor) asked me to take the aspirin or something... I... did not take it. Because... my wife heard from some traditional Chinese medicine doctors who said I did not have to take it. My wife suggested me to take some traditional Chinese patent medicines." (P11 male, 61yrs, CHD 3yrs)

Secondly, some participants self-prescribing TCM did not disclose this to their Australian clinicians. Without professional instruction, the potential medication interaction or contradictions between Western medication and TCM could complicate their medication regimes. One participant taking TCM for managing her cardiac symptoms presented with side-effects.

"I feel I should do (see my general practitioner) that after trying the Chinese herbs. It does... have some side effects, as I have started to have stomach pain after taking it for a while... It hurts my stomach, because it is strong medicine. Even my skin has become dry and chapped." (P17, female 68 yrs, CHD 6yrs)

Thirdly, participants in this study used TCM to self-manage their acute angina episode, which is not in line with their nitro-glycerine prescription from their Australian clinicians. There is consequently a risk that use of TCM can mask patients' cardiac symptoms and delay initiation of effective and timely treatment of their angina or heart attack, which could be life-threatening.

"Nitroglycerin does not work for me. I carry a different medication that I brought from China, called fast-acting heart rescue pills. It is traditional Chinese medicine. But because it works so well, I really trust it" (P16, male, 76yrs, residence 3 yrs, CHD 7yrs).

(4) Financial Issues including Health Insurances. Many participants were aware of the central role of the Australian Medicare national insurance system in funding cardiac care, especially those who had experienced hospitalisation. Medicare subsidies relieved their economic and mental stresses to a large extent which promoted their engagement in acute medical treatments and overall self-care behaviours.

3.2.4. Theme Four: New Living Environment and Self-Care. Nearly half the participants praised the Australian environment compared to China, citing its good air quality, nice weather, comfortable temperature, and food safety. They believed these improvements in their living environment contributed to their emotional well-being and favoured their overall heart disease self-care.

"I feel living in Australia is a better choice for me in terms of my heart disease. Because the air quality in Australia is quite good" (P10, female, 64yrs, residence 32yrs, stroke 8yrs).

4. Discussion

To our knowledge, this is the first study to comprehensively explore and identify the domains of acculturation experiences influencing self-care behaviours among first-generation Chinese immigrants living with CVD in Australia. The influence of acculturation on CVD self-care behaviours was shown to be complex, individualized, and multifaceted. The specific domains of acculturation experiences, encompassing cultural practices, cultural values, healthcare systems utilization, and new living environment, mainly affected cardiac self-care maintenance. Both retaining their Chinese culture and integrating with Australian culture in dietary practices, social networks, traditional values, and family relationships served as enablers and barriers of self-care maintenance behaviours such as adherence to medications, heart healthy diets, physical activity, and stress management. Language barriers could prevent cardiac Chinese immigrants from accessing acute care services and obtaining heart health information from mainstream sources. Although many participants denied the presence of access barriers to primary care services and some praised the healthcare system in Australia, some preserved beliefs and practices in Traditional Chinese Medicine may complicate their medication adherence and self-care management, particularly in response to acute angina.

Although retaining their Chinese dietary habits, integration of some Western foods into meals was prevalent among these Chinese immigrants. This was well-supported by prior studies conducted in the US, Spain, Australia, and Canada, showing that Chinese immigrants shifted to western-style breakfasts (milk, cereal, and breads) and increased consumption of red meat and sugar over the course of acculturation [27–29]. Postmigration diet practices in our study both enabled and deterred adherence to heart-healthy diets in this population, depending on their individualized acculturation experience. Accordingly, it is essential for clinicians to assess Chinese immigrants' dietary acculturation experiences before offering generic recommendations. To improve adherence to dietary regimens, heart-healthy Chinese eating habits could be reinforced by clinical practitioners. Efforts need also be undertaken to encourage selective adoption of healthy Western foods.

Consistent with previous findings on social relations among Chinese immigrants in the US, Spain, and Australia, our study showed that this population affirmatively

maintained strong ties with ethnic communities and relied heavily on Chinese community associations for coping with acculturation stress and obtaining settlement resources [28, 30, 31]. Rather than attending gyms, many participants in this study preferred group-based exercises such as dancing and Tai Chi. This could be partially attributed to Chinese community associations regularly organizing such group-based physical activities. Moreover, these community associations supported participants to adopt heart-healthy lifestyles by providing health talks on nutrition, which these participants appreciated. Thus, for the future, partnerships between healthcare providers and Chinese community associations offer an opportunity to develop and deliver culturally and linguistically appropriate community-based heart health education programs for Chinese immigrants to improve their cardiac self-care behaviours.

Language was a major barrier for Chinese immigrants to access acute health services, but less so for primary and specialist care. This was confirmed in a systematic review [32] and can be explained by participants self-selecting Mandarin-speaking general practitioners and cardiologists but having no choice of acute care health professionals. Language barriers also prevented Chinese immigrants from accessing heart health information from mainstream sources. This was strongly supported in other studies flagging the lack of culturally and linguistically appropriate heart health information for Chinese immigrants living with CVD [4, 16]. Participants' use of Chinese community associations offers the opportunity to partner for co-design and delivery of culturally sensitive heart health education programs.

Traditional values and family relationships, particularly filial piety, were important influences. Other studies have shown older Chinese immigrants to be vulnerable to depressive symptoms, attributed to acculturation stress [33, 34]. In our study, family conflicts stemming from unmet filial piety expectations from adult children undermined older Chinese immigrants' mental well-being and resulted in social isolation. This was also seen in previous studies [35, 36]. Although some cultural philosophies endorsed by Chinese immigrants were beneficial to self-management of stress, the typically reserved emotional habitus of Chinese cultures can deter professional help-seeking for mental support and has been blamed for low utilization of mental health services. Clinicians should be aware of the potential impact of such issues and consider assessment of Chinese immigrants' mental health, with referral for culturally sensitive psychological support, as appropriate.

Chinese immigrants in this study accessed primary care services, particularly general practitioners, for their CVD management. This is inconsistent with other studies showing low utilization of primary care services among this population [31, 37]. This can perhaps be explained by this population living in ethnic-enclave neighbourhoods where Mandarin-speaking health practitioners are available. However, study participants were unfamiliar with ways to access allied health services, resulted in low use of dietitians and cardiac rehabilitation. This presents an opportunity to investigate avenues to improve access to these specialist services, to support cardiac self-care management.

Although Chinese immigrants were broadly adherent to physician-prescribed cardiac medications, many used TCM as adjuvant or first-line medication, such as using heart rescue pills to manage acute angina. This finding differs to a previous study, where TCM was solely taken as a second choice for treating CVD [38]. Several considerations may explain this. In our study, 30% of participants received their CVD diagnosis and initial treatment in China, which may have familiarised them and established a habit of TCM. Further, some participants were told by their Chinese social networks to take TCM to self-manage their angina episode. The use of TCM can complicate and mask angina symptoms, delaying help-seeking to manage their angina. Clinicians should assess the use of TCM in this population, particularly for those initially diagnosed with CVD in China. Health education on first response management of acute cardiac events is urgently needed for Chinese immigrant populations.

Study limitations include that participants were recruited solely from the Sydney area and responses may not represent the experiences of Chinese immigrants living elsewhere. Participants were recruited from social media, Chinese community associations and medical centres in Chinese-enclaved areas, which may exclude marginalised older Chinese immigrants who had low digital literacy or lived remotely. The inclusion criterion that required participants to speak English or Mandarin excluded immigrants who only spoke Cantonese. Social desirability and self-selection bias may have affected the interview data, and recall bias may have influenced accounts of their CVD diagnosis and self-care behaviours. Finally, transcripts were not shared with participants for member-checking as they had been translated into English.

5. Conclusions

The role of acculturation in relation to CVD self-care behaviours among Chinese immigrants is multifaceted and individualized. For clinicians and community health workers, to avoid stereotypical responses and enable culturally appropriate and responsive practice, it is necessary to evaluate their patients' acculturation experiences regarding cultural practices and values, and adaptation to new healthcare systems. Their cardiac medical history and use of TCM should be assessed by health practitioners to improve Chinese immigrants' medication adherence and safety. Family relationship plays an essential role in the CVD self-care of Chinese immigrants and family members should be involved in patients' treatment plans and heart-healthy lifestyle education. For health organizations and policy makers, lack of culturally and linguistically appropriate heart health information in the community compromises Chinese immigrants' cardiac self-care behaviours, and should be addressed urgently via policy development and local service delivery. Collaboration with Chinese community associations offers an opportunity for co-design and dissemination of information about Australian healthcare systems and heart health education to upskill CVD self-care practices and mitigate the health inequities experienced by Chinese immigrants in Australia.

Data Availability

The data utilized in this study is high sensitive. The de-identified data can be available from contacting the corresponding author if the reviewers request.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Authors' Contributions

The author team agreed on the final version of manuscript submission. Ling ZENG was responsible for study conception, study design, data collection, data analysis, data interpretation, and drafted the manuscript. Xiaoyue XU and Lin Perry were responsible for study conception, study design, data analysis, data interpretation, and manuscript revision and edit.

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Supplementary Materials

Supplementary Table 1: interview guide. (Supplementary Materials)

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