Traditional Chinese Medicine Use amongst Women with Arthritis: a Health Services Research Study

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Lu Yang, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Health at the University of Technology Sydney.

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

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except fully acknowledged within the text.

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Signature removed prior to publication.

Lu Yang

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STATEMENT OF CONTRIBUTIONS TO JOINTLY AUTHORED WORKS CONTAINED IN THE THESIS

The results presented from this thesis have been submitted for publication in peer-reviewed journals through four articles (one literature review and three discrete original articles), presented in Chapter 2 through Chapter 4. For each of these papers, I have been primarily responsible for designing the research questions, undertaking the research analyses and writing the drafts of the manuscript.

Distinguished Professor Jon Adams, Professor David Sibbritt, and Dr Wenbo Peng have provided support with final stages of drafting manuscripts.

I take full responsibility for the accuracy of the findings presented in these publications and this thesis.

PUBLISHED WORKS BY THE AUTHOR INCORPORATED INTO THE THESIS

Of the four manuscripts included in this thesis, all have been published in the high-quality peer-reviewed journals. Following is the list of manuscripts contained in this thesis:

1. **Yang, L.**, Sibbritt, D. and Adams, J. (2016). A critical review of complementary and alternative medicine use among people with arthritis: a focus upon prevalence, cost, user profiles, motivation, decision-making, perceived benefits and communication. *Rheumatology International*, 37(3), pp. 337-351.
2. **Yang, L.**, Sibbritt, D. and Adams, J. (2017). Prevalence and factors associated with the use of acupuncture and Chinese medicine: results of a nationally representative survey of 17,161 Australian women. *Acupuncture in Medicine*, 35(3), pp. 189-199.
3. **Yang, L.**, Peng, W., Sibbritt, D. and Adams, J. (2017). Prevalence and characteristics of Australian women aged 45 and older who consult acupuncturists for their osteoarthritis. *The International Journal of Clinical Practice*, 71(12).
4. **Yang, L.**, Peng, W., Sibbritt, D. and Adams, J. (2018). Treating people with arthritis with traditional Chinese medicine (TCM): an examination of the perception of TCM practitioners. *Acupuncture in Medicine*. (In press). http://dx.doi.org/10.1136/acupmed-2017-011527

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ABBREVIATIONS

ABRASCO – Brazilian Collective Health Association

ABS – Australian Bureau of Statistics

AHPRA – Australian Health Practitioners Regulation Agency

AIHW – Australian Institute of Health and Welfare

ALSWH – Australian Longitudinal Study on Women's Health

APHA– American Public Health Association

APS – American Pain Society

ARCCIM – Australian Research Centre in Complementary and Integrative Medicine

ASGC – Australian Standard Geographical Classification

CAM – Complementary and alternative medicine

CI – Confidence interval

CMBA – Chinese Medicine Board of Australia

DMARDs – Disease-modifying anti-rheumatic drugs

GP – General practitioner

HREC – Human Research Ethics Committee

HSR – Health services research

NCCAM – National Centre for Complementary and Alternative Medicine

NHIS – National Health Interview Survey

NHMRC – Australian National Health and Medical Research Council

NIH – National Institute of Health

NSAIDs – Nonsteroidal anti-inflammatory drugs

OA – Osteoarthritis

OR – Odds ratio

PBRN – Practice-based research network

PHAA – Public Health Association of Australia

PHASA – Public Health Association of South Africa

PRACI – Practitioner Research and Collaboration Initiative

RA – Rheumatoid arthritis

RCT – Randomised controlled trial

TCM – Traditional Chinese medicine

TGA – Therapeutic Goods Administration

US – United States

WHO – World Health Organisation

WOMAC – Western Ontario and McMaster Universities Osteoarthritis Index

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ABSTRACT

Background: The use of traditional Chinese medicine (TCM) has attracted increasing attention for physical and mental health studies over recent years. To date, there have been few nationally representative studies examining TCM treatments as well as consultations with TCM practitioners, for women with arthritis.

Methods: The thesis study outlined here consists of four related but separate sections of research. First, a critical review was conducted focusing on TCM and other complementary and alternative medicine (CAM) use amongst patients with arthritis via a search of the key medicine and health science databases for international peer-reviewed articles published in the previous eight years (2008-2015). The study also conducted secondary and primary analyses of data from large samples (including both patients and practitioners) obtained by drawing upon three distinct large-scale established studies in Australia – the Australian Longitudinal Study on Women's Health (ALSWH), the Sax Institute's 45 and Up Study and the Practitioner Research and Collaborate Initiative (PRACI) study. Statistical analyses involved chi-square tests, multiple logistic regression, two proportions Z tests, Student's t-tests, etc. to examine associations between the use of TCM (i.e. Chinese herbal medicine and acupuncture) and arthritis-related symptoms. Chi-square tests or Fishers Exact tests were employed for categorical variables, and Student's t-tests were employed for continuous variables, to examine TCM practitioners' perceptions and the role of TCM practitioners in Australia regarding arthritis care.

Results: Findings from the critical review show a high prevalence of TCM/CAM use amongst people with arthritis in a number of countries and many people with

arthritis use TCM/CAM concurrently with their conventional medicine. The results from ALSWH study identify women with arthritis are more likely to use TCM than women without arthritis, with 6.2-9.5%, and 4.0-5.7% of Australian women reported to be using acupuncture and Chinese herbal medicine, respectively, in the previous 12 months. Moreover, the analyses from the 45 and Up Study sub-study show that acupuncture use is positively associated with women experiencing a longer duration of time since initial diagnosis of osteoarthritis (OR=1.04), undertaking more exercise (OR=5.41), living in a rural area (OR=3.62), having consulted a psychologist (OR=12.21), and having consulted another CAM practitioner (OR=4.18). In addition, it is reported from the PRACI study that the majority of the TCM practitioners (82.2%) noticed that their patients with arthritis used other treatments alongside TCM and a large number of TCM practitioners who participated in the study believe TCM to be effective for treating arthritis.

Conclusions: TCM use is popular amongst women with arthritis and the TCM profession represents a significant part of Australian CAM healthcare sector in treating arthritis. This thesis highlights a need for future research to examine the potential benefits of TCM for arthritis and to help inform the efficient and safe use of this treatment alongside conventional care. Moreover, all health professionals offering care for those with arthritis need to be aware of the concurrent use of both TCM and conventional medications amongst their patients.

CHAPTER 1 BACKGROUND

This chapter provides context for the thesis. It outlines the scope of the thesis, introduces a health services research (HSR) framework for the research presented, and provides contemporary definitions of the key topics examined. The thesis objectives and research questions are also included together with background information in order to introduce the chapters to follow.

1.1 A health services research framework for the examination of traditional Chinese medicine

In Australia and elsewhere, traditional Chinese medicine (TCM) has emerged as an integral part of the growing field of complementary and alternative medicine (CAM) (Adams et al. 2013; Bodeker Gerard et al. 2005). The rapidly increasing research interests in TCM have been dominated by a focus upon the clinical efficacy of TCM modalities (Daily et al. 2017; Hao et al. 2017). More recently, researchers have begun to ask related but equally important questions around TCM/CAM use and practice that fall within the disciplinary perspectives of public health, health services research (HSR) and health social science (Adams 2008; Adams, Sommers & Robinson 2013). However, there remains very little research from a HSR perspective and approach which has focused directly and predominantly upon TCM. This background section outlines the definitions and explores the role and value of HSR in the examination of TCM practice and use (with a particular interest in TCM use in the care of women with arthritis).

1.1.1 Current approaches to traditional Chinese medicine research

TCM has been used in clinical practice for more than 2,000 years (Jiang et al. 2010), and research interest on the topic of TCM has grown considerably during recent years (Moore et al. 2016; Xue et al. 2010). Research employing study designs such as randomized controlled trials (RCTs) and systematic reviews have been conducted on acupuncture and Chinese herbal medicine (CHM) over the last few decades which have provided evidence of the therapeutic potential of TCM modalities for the treatment of a broad range of conditions, such as pain, rheumatoid arthritis (RA), depression and insomnia (Rubio, Mansfield & Lewis 2017; Xue et al. 2010; Yeung & Chung 2017).

1.1.2 The contribution of health services research to the examination of traditional Chinese medicine

Set within the wider range of different research methods, this thesis draws upon the methods and principles of a HSR approach to critically investigate the practice of TCM for arthritis and the use of TCM by women with arthritis.

1.1.2.1 Definition of health services research

The term HSR began to be conceptualised in the 1960s in the US to study important healthcare issues such as cost, access, quality of care and patient outcome, and the field of HSR was developing rapidly by 1981 when the Association for Health Services Research was established (Bindman 2013; Shi 2007). Since then, HSR has developed into a recognised multi-disciplinary field of the healthcare and medical research landscape which examines how people access and utilise healthcare, how much care costs, and what happens to patients as a result of this care (Shi 2007). In June 2000,

the Academy for Health Services Research and Health Policy provided a definition of HSR as follows: "*Health services research is the multidisciplinary field of scientific investigation that studies how social factors, financing systems, organisational structures and processes, health technologies, and personal behaviours affect access to healthcare, the quality and cost of healthcare, and ultimately our health and well-being. Its research domains are individuals, families, organisations, institutions, communities, and populations*" (Lohr & Steinwachs, 2002).

The wide scope of methods employed by HSR researchers encompasses a variety of study frameworks, designs, and analytic techniques (US National Library of Medicine 2007). HSR evaluates the need, demand, supply, use, and outcomes of healthcare services, in order to identify more effective and efficient approaches to the organisation, management, delivery, and financing of healthcare to improve patient-centred health outcomes (Horner, Russ-Sellers & Youkey 2013; US National Library of Medicine 2007).

1.1.2.2 Health services research approaches used for the investigation of traditional Chinese medicine

Research on TCM and other CAM modalities has to date predominantly focused upon assessing efficacy and safety of interventions via clinical trials and experimental models (Adams 2008; Bodeker & Kronenberg 2002). In order to ensure patients' safety, the strong clinical evidence is required across biomedical and complementary/traditional medicine settings (Adams, Sommers & Robinson 2013). However, researchers, practitioners, and patients should not focus exclusively upon clinical efficacy with regard to TCM and broader CAM. It is important that sufficient

consideration and support also be devoted to other research perspectives and approaches that are able to help contribute to the successful translation of findings from fieldwork to practice (Adams, Sommers & Robinson 2013). In order to fully understand TCM and maximise the potential role of TCM in HSR, there is a need to expand the research gaze beyond RCTs designed to evaluate clinical effectiveness. Whilst a need for ongoing RCTs undoubtedly exists, public health research and HSR is important to gain insight into the prevalence of TCM/CAM use, users' characteristics, determinants of use and the interface between TCM/CAM use and use of conventional medicine (Adams 2007).

Meanwhile, governments have been increasingly supporting and emphasising HSR which focuses on the growing use of TCM/CAM. In the United Kingdom (UK), a Department of Health 'Policy Research Programme' (PRP), which aims to provide a knowledge base for health services policy supported two TCM/CAM research projects through Sheffield University Medical Research Unit in 2000 (House of Lords Select Committee on Science and Technology 2002). Moreover, the Australian Research Centre in Complementary and Integrative Medicine (ARCCIM) at the Faculty of Health at University of Technology Sydney was established in 2012, to utilise and promote methods and disciplines focusing on public health and HSR in order to advance both TCM/CAM research and research capacity building, and has attracted over AUS$ 15 Million including 16 NHMRC and ARC grants on HSR in TCM/CAM. Furthermore, a number of peak national public health associations such as the Public Health Association of South Africa (PHASA), the American Public Health Association (APHA), Brazilian Collective Health Association (ABRASCO) and the Public Health

Association of Australia (PHAA) have all established special interest groups or committees charged with exploring and advancing evidence research and policy in TCM/CAM over the last few years (www.phaa.net.au).

1.1.3 A health services research approach to examining traditional Chinese medicine in the context of arthritis care

Arthritis is one of the leading causes of pain, disability, and health services use amongst older adults which also affects patients' emotional, social and spiritual well-being (Yang, Sibbritt & Adams 2017). There are more than 100 types of different conditions included under the title arthritis, with osteoarthritis (OA) and RA being the two most common forms (Section 2.1.2). There is no cure for arthritis, and surgical interventions such as total joint replacement still require further controlled trials on many different prosthetic devices (Sinusas 2012). As such, a variety of TCM/CAM modalities have been increasingly used for people with arthritis (Section 2.1.2) in order to improve quality of life (Zhang, Li, et al. 2010). Previous research has shown that TCM/CAM has been widely accepted and used amongst those with arthritis (Chen et al. 2016; Mielenz, Xiao & Callahan 2016; Sharpe et al. 2016). Systematic reviews and clinical trials have been conducted on individual TCM/CAM modalities such as yoga, physiotherapy and dietary interventions on arthritis (Hurkmans et al. 2011; Sharma 2014; Smedslund et al. 2010). However, TCM, which is a core part of CAM, has not been fully examined within relevant HSR research and there is a dearth of evidence regarding topics such as the prevalence of TCM use, the TCM users' profile, perceptions, and decision-making.

There are a variety of TCM therapies provided by TCM practitioners such as acupuncture, CHM, moxa, Chinese therapeutic massage, self-practice Tai Chi and Qi Gong (Hou et al. 2015; Lee, Pittler & Ernst 2007). Interestingly, while HSR focusing on TCM/CAM use for arthritis has increased recently, few studies have focused on TCM use amongst people with arthritis including women's use of TCM for arthritis and the role of individual TCM therapy (acupuncture, CHM) in the treatment of arthritis amongst women (Hou et al. 2015; Huang et al. 2015). A HSR focus on TCM use for arthritis can help provide a detailed and insightful investigation of the circumstances around TCM practitioners, their behaviours and perceptions regarding arthritis care, as well as exploring the potential for the incorporation of TCM into the broader healthcare system. As such, this thesis applies a HSR approach to examine the use of TCM and consultations with TCM practitioners amongst large samples of women with arthritis, as well as examining aspects of TCM practitioner care for arthritis in Australia. The detailed research aims and scope of the thesis are outlined below.

1.2 Aims and scope of this thesis

1.2.1 Research aim

The study has two distinct but interrelated aims, to utilise a HSR approach to both examine women's use of TCM for their arthritis, and the practice of TCM practitioners regarding arthritis.

1.2.2 Research questions

In order to address the research aims, this study will answer five separate but interrelated research questions as outlined below:

1. What is the prevalence of Australian women's use of TCM for their general health and for arthritis specifically?

2. What are the demographic characteristics of Australian women with arthritis who use TCM?

3. What is the association between women's use of TCM and a wide range of conventional healthcare choices and other CAM (chiropractic, homeopathy, naturopathy, etc.) amongst women with arthritis?

4. What are the characteristics of TCM practitioners in Australia, and the relationships between TCM practitioners and conventional healthcare providers, and other CAM providers in Australia?

5. What are the perceptions of Australian TCM practitioners on using TCM to treat arthritis?

1.2.3 Significance and scope of thesis

Studies have shown an increasing prevalence of TCM use for arthritis (Huang et al. 2015; Moudgil & Berman 2014; Sibbritt, Adams & Moxey 2011; Zhang, Li, et al. 2010). However, to date, no work has provided a HSR focused analysis of TCM use for arthritis. Specifically, there remains little research regarding Australian women's use of TCM for arthritis, and no investigation has examined TCM practitioners' perceptions and behaviours regarding treating arthritis. As such, this thesis presents the first large nationally representative study regarding the use of TCM for arthritis-related symptom management by providing empirical data and valuable information of TCM use for Australian women with arthritis, and the perceptions and practices of

TCM practitioners regarding treating arthritis. This thesis highlights a need for future research to examine the potential benefits of TCM for arthritis and to help inform the efficient and safe use of this treatment alongside conventional care.

1.2.4 Organisation of thesis

The findings from this research have resulted in several journal publications which are presented in relevant chapters. The overall structure of the thesis is shown below:

Chapter 1 provides background information with regard to a) a HSR approach to TCM/CAM research generally and specifically to arthritis and b) the wider context of TCM/CAM including definitions, global use of TCM/CAM, TCM/CAM use in Australia, and the use of TCM/CAM for women with arthritis in Australia.

Chapter 2 reviews the last eight years of literature regarding TCM/CAM use for arthritis, including the prevalence, users' profile, motivations, decision-making, perceived benefits, and communications. The results from this chapter have been published in *Rheumatology International*.

Chapter 3 covers the methodology of this thesis, including study design, sample selection, ethical considerations and statistical analyses employed during the research.

Chapter 4, Section 4.1, presents the first analyses results of this thesis and describes the prevalence, and characteristics of women's use of TCM in Australia. These findings have been published in *Acupuncture in Medicine*.

Chapter 4, Section 4.2, presents the results of the prevalence and characteristics of Australian women aged 45 and older who consulted acupuncturists for their OA. These findings have been published in *International Journal of Clinical Practice*.

Chapter 4, Section 4.3, presents the results of the study regarding the perceptions of TCM practitioners on using TCM for arthritis. These findings have been published in *Acupuncture in Medicine*.

Chapter 5, the discussion chapter, demonstrates the primary areas for future research examining TCM use amongst women with arthritis, including 1) women's use of TCM is associated with arthritis symptoms; 2) the prevalence of TCM use is considerable amongst women with arthritis; 3) the health status associated with arthritis may lead to the increased rate of TCM use amongst women with arthritis; 4) lifestyle factors are associated with TCM use amongst women with arthritis, and 5) referrals associated with TCM use for women with arthritis. Study limitations, implications and future research areas were also identified.

Chapter 6 summarises a number of findings from this thesis. Overall, this research is the first to examine TCM use amongst women with arthritis employing a HSR research method based on literature review and secondary data analyses. The analyses of data from ALSWH, the 45 and Up Study sub-study and PRACI provide the first empirical evidence and insight regarding the use of TCM for women with arthritis. Moreover, the integration of both the literature review and the primary and secondary data analyses results reported in this thesis will have an important impact on the TCM use for arthritis management.

1.3 The significance of complementary and alternative medicine

CAM use has been increasingly studied across the general population and people with a number of chronic illnesses including arthritis. TCM is one of the most frequently used CAM modalities. As such, this section of the Background Chapter describes the definition of CAM, CAM modalities, the use of CAM amongst people with arthritis, and leads to issues regarding TCM/CAM research on arthritis.

1.3.1 Definition of complementary and alternative medicine

In the US, the definition of CAM used by the National Centre for Complementary and Alternative Medicine (NCCAM 2008) in the United States (US) is "a group of diverse medical and healthcare systems, practices, and products that are not generally considered part of conventional medicine". The Australian National Health and Medical Research Council (NHMRC) has defined CAM as a broad term used to describe a wide range of healthcare medicines and therapies (forms of treatment that do not involve medicines), being used to treat conditions that are chronic, serious, or could become serious, in place of evidence-based treatments (NHMRC 2017).

The US National Institutes of Health has categorised CAM approaches into two groups - natural products (e.g. herbs, vitamins and minerals, and probiotics); mind and body practices (e.g. yoga, chiropractic and osteopathic manipulation, meditation, and massage therapy, acupuncture, relaxation techniques, Tai Chi, Qi Gong, healing touch, hypnotherapy, and movement therapies); and other CAM approaches (e.g. Ayurvedic medicine, TCM, homeopathy, and naturopathy) (NCCIH 2017). For the purposes of this thesis, I here use the definition provided by recent

researchers and commentators that defines CAM as 'those practices, technologies, treatments, and approaches to health and illness that do not traditionally reside with the medical profession or within the medical curriculum' (Adams et al. 2012).

1.3.2 Contemporary context of complementary and alternative medicine

A broad range of CAM modalities have been used globally and have been partly integrated into conventional healthcare systems (Shorofi & Arbon 2017). This section outlines the prevalence of CAM use, the profile of CAM users, and CAM use for people with arthritis over recent years.

1.3.2.1 Prevalence of complementary and alternative medicine use

The prevalence of CAM use is increasing. Analysis from a Canadian national population health survey between 1994 and 2011 showed that the prevalence of CAM use increased from 4.8% to 11.2% (Canizares et al. 2017). Moreover, trends in CAM use have grown significantly in the US from 2002 to 2007, based on data from the 2002 and 2007 National Health Interview Survey (NHIS) (Su & Li 2011).

The use of CAM has also become popular amongst the Australian general population. The first nationwide study examining CAM use by Australian adults and their socio-demographic characteristics concluded that 68.9% of 1067 participants had used at least one form of CAM approaches in the previous 12 months, and spent a total of AUD$ 4.13 billion (USD$ 3.12 billion) on CAM, which was higher than the amount Australians spend on out-of-pocket payment on pharmaceuticals (Xue et al. 2007). The prevalence rate of reported CAM use in Australia ranges from 24-79%. A recent nationwide study estimated that approximately 24% of Australian adults with a

chronic condition (1.3 million) regularly use CAM as a treatment option (Armstrong et al. 2011). Similarly, based on data from a representative National Health survey 2007/2008 of the Australian population (N=15,779), the prevalence rate for any type of CAM use was around 39% amongst the adult population (Spinks & Hollingsworth 2012). More recently, results from a survey of 1,256 adults, who were interviewed as part of 2012 Queensland Social Survey, indicated that 79% of people had used CAM in the last 12 months (Thomson et al. 2014).

1.3.2.2 The characteristics and determinants of complementary and alternative medicine users

It is noticeable that specific social-demographic characteristics of CAM users have been identified in nationally representative studies. Specifically, CAM users are more likely to be female, middle-aged and to report fair or poor health status (Thomson et al. 2012; Wang, Kennedy & Wu 2015). Specifically, CAM users had higher education and higher income, are more likely to be physically active, are more likely to report pain and are less likely to be current smokers, compared to non-CAM users (Canizares et al. 2017). Moreover, in comparison to non-CAM users, CAM users are more likely to have chronic diseases such as musculoskeletal conditions (including arthritis), pain or depression/anxiety (Canizares et al. 2017; Marques-Vidal et al. 2009; Saydah & Eberhardt 2006; Yen, Jowsey & McRae 2013). In addition, CAM use is also associated with higher use of conventional healthcare services (Canizares et al. 2017; Sirois 2008).

1.3.2.3 Complementary and alternative medicine practice in arthritis care

Previous studies show that people with arthritis have been found to be frequent users of CAM (Bishop & Lewith 2010), and acupuncture and other CAM therapies (such as yoga, massage therapy, and dietary supplements) seem to be the most common choices for people with arthritis (Amezaga Urruela & Suarez-Almazor 2012; Canizares & Badley 2016; Marques-Vidal et al. 2009; Sharma 2014). The US 2002 NHIS indicated that 6.5% of 270 individuals who had used acupuncture in the past 12 months, used acupuncture for arthritis/gout/lupus/fibromyalgia (Burke et al. 2006). Moreover, yoga and TCM therapies (Tai Chi and Qi Gong) were the highest proportion (33.2%) of CAM modalities used to treat arthritis (Quandt et al. 2005).

In Australia, 69% of 435 OA sufferers reported that they had tried CAM for their OA, and those who had a better knowledge of their OA condition and excellent self-rated health were more likely to use CAM (Basedow et al. 2014). Moreover, according to a cross-sectional study conducted in Switzerland comprising 970 women and 598 men with arthritis, calcium supplement users were more likely to be women, more physically active and more likely to have arthritis, anxiety, depression, cancer and osteoporosis (Marques-Vidal et al. 2009).

1.3.3 Complementary and alternative provision in the Australian healthcare setting

The CAM workforce is smaller than the general practitioner (GP) workforce in Australia, based on the data provided by Australian Health Practitioner Regulation Agency (AHPRA) (Leach 2013). AHPRA is the only government organisation responsible for the implementation of the National Registration and Accreditation Scheme across Australia with 14 National Health Practitioner Boards, including three

CAM health practitioner boards (Chinese Medicine Board of Australia, Chiropractic Board of Australia and Osteopathy Board of Australia), along with Aboriginal and Torres Strait Islander Health Practice Board of Australia; Dental Board of Australia; Medical Board of Australia; Medical Radiation Practice Board of Australia; Nursing and Midwifery Board of Australia; Occupational Therapy Board of Australia; Optometry Board of Australia; Pharmacy Board of Australia; Physiotherapy Board of Australia; Podiatry Board of Australia; Psychology Board of Australia (https://www.ahpra.gov.au). As of March 2017, there were 4,831 TCM practitioners registered in Australia with AHPRA.

1.4 The significance of traditional Chinese medicine

The focus of this thesis is the use of TCM, which is a core component of CAM modalities in developed countries and has been used for more than 2,000 years in China (Jiang et al. 2010; Peng, Sibbritt, et al. 2014).

1.4.1 Definition of traditional Chinese medicine

TCM is based on the theory of yin-yang and five elements (Department of Health & Human Services 2013; Kayne 2010). The yin-yang theory interprets two opposing yet complementary forces as supporting health and perceives disease as results from an imbalance between these forces (Department of Health & Human Services 2013; Kayne 2010). The five elements theory means fire, earth, wood, metal, and water symbolically represent all phenomena, including the stages of human life, and explain the functioning of the body and how it changes during disease (Department of Health & Human Services 2013; Kayne 2010). Using a rationale based on these concepts,

TCM explains the physiology and state of the viscera and deals with different types of health problems (Kayne 2010).

TCM has evolved through the experience of more than 2,000 years of clinical practice (including CHM, acupuncture, cupping, Tui Na, Tai Chi, Qi Gong and dietary therapy) (Peng, Adams, et al. 2014). The definition of TCM user in Section 2.1.2 refers to a person who has used any one of the five major forms of Chinese medicine: acupuncture, CHM, Chinese therapeutic massage (CTM), Chinese medicine dietary therapy (CMDT), and Qi Gong, martial art, and Tai Chi (QGMATC). This definition also applies to people who visit any one of the five types of Chinese medicine practitioners. The definition of TCM user in Section 4.1.2 refers to a woman who has consulted an acupuncturist or used any CHM.

1.4.2 Contemporary context of traditional Chinese medicine

Since the former American president Richard Nixon instituted a program in which TCM practitioners came to the US to share their medicine, and American doctors were sent to China for sharing their medicine in the late 20th century, the demand for TCM has been growing steadily in developed Western countries (Hope-Allan et al. 2004; Melchart et al. 1999; Schmincke et al. 2008; Zhu, Carlton & Bensoussan 2009). In Australia, TCM has a long history and popularity when compared to other Western countries. TCM arrived with Chinese immigrants during the Victorian gold rushes (which began in the 1800s) and was used extensively beyond the Chinese immigrant community by 1911 (Loh 1985). By 1996, amongst estimated 4,500 TCM practitioners in Australia, almost two-thirds incorporated TCM (particularly acupuncture) into their existing practice including providers of conventional medicine, chiropractic,

physiotherapy, and nursing (Moore et al. 2016; WHO 2013; Zhu, Carlton & Bensoussan 2009).

1.4.2.1 Prevalence of traditional Chinese medicine use

TCM is not only popular amongst the Chinese population, but also has attracted increasing attention in Western countries (Cassidy 1998; Chen et al. 2007; Moore et al. 2016; WHO 2013). It was estimated that at least 2.8 million consultations with TCM practitioners were provided each year in Australia (Zhu, Carlton & Bensoussan 2009). A national population-based survey conducted with a sample of 1,067 adults, indicated that approximately 29.6% of participants used TCM treatments at some stage, with 9% using acupuncture, 7.0% using CHM, 6.0% using Tai Chi, Qi Gong and martial art, 5.1% using Chinese therapeutic massage, and 2.3% using Chinese dietary therapy (Xue et al. 2007).

1.4.2.2 The characteristics and determinants of traditional Chinese medicine users

In line with the characteristics of CAM users, females are also more likely than males to use TCM (Cassidy 1998; Chen et al. 2007; Shih et al. 2017). CHM and acupuncture are the most common TCM modalities used (Cassidy 1998; Chen et al. 2007), and the main reasons for seeking TCM modalities have been found to be relief of pain, unstable mood and maintenance of well-being or good health (Cassidy 1998; Manheimer et al. 2009). Moreover, people chose to use TCM because they are frustrated with conventional care (Cassidy 1998; Manheimer et al. 2009). Specifically, women with chronic diseases have a higher expectation of belief in TCM, compared to conventional medicine (Chen et al. 2007). Furthermore, there is much self-

reported effectiveness by TCM users where they reported that their symptoms or conditions “disappeared” or “improved” after TCM use (Cassidy 1998; Feng et al. 2017; Smith & Bauer-Wu 2012). Moreover, respondents who used multiple forms of healthcare believed TCM “definitely” or “probably” made the difference to their health (Cassidy 1998).

In addition to the ‘health promotion’ beliefs amongst TCM/CAM users (Harris et al. 2012; Ock et al. 2009), the management of chronic illness (e.g. fatigue and pain), and improving overall poor health status have been identified as the most common reasons for using TCM (Lai & Chappell 2006; Shih et al. 2012; Yang et al. 2009). Research has shown a number of clinical evidence for the efficacy of TCM with regard to chronic illnesses such as RA (Wang et al. 2017), OA (Chen et al. 2016), fibromyalgia (Cao, Liu & Lewith 2010), diabetes (Vogler & Ernst 1999) and digestive disorders (Nahin & Straus 2001; Shih et al. 2012). To date, minimal research has examined the prevalence and determinants of TCM usage within a Western country especially from a large population study (Moore et al. 2016). As such, the study reported in this thesis constitutes a first step towards addressing this important research gap by providing a detailed understanding of TCM use and practice in Australia.

1.4.3 Traditional Chinese medicine provision in the Australian healthcare setting

In Australia, it was estimated that 8.6% of 10,287 middle-aged women used CHM in 2007, and these women were more likely to live in rural areas, have a high school education, and frequently visit both doctors and TCM practitioners compared to women who did not use TCM (Sibbritt, Adams & Murthy 2013). Moreover, CHM users have an average of six visits to CHM practitioners per year, with an estimated 2.1

million CHM practitioner visits per year nationally (Xue et al. 2007). TCM provision has attracted increasing attention in recent years in Australia. Firstly, The Chinese Medicine Registration Act 2000 was proposed and adopted in the State of Victoria. Then, the Health Profession Registration Act 2005 was adopted in order to regulate and manage healthcare professionals including TCM practitioners. In 2010, AHPRA was established (https://www.ahpra.gov.au). The national registration for TCM practitioners was made mandatory in 2012. All TCM practitioners have to register through the Chinese Medicine Board of Australia (part of AHPRA) to legally practice. In 2017, 4,881 practitioners were registered with the Chinese Medicine Board of Australia (CMBA 2017).

In September 2017, there were 1,736 practitioners registered with the CMBA as acupuncturists only and 2,185 practitioners registered as both acupuncturists and CHM practitioners. The three divisions (acupuncturist, CHM practitioner, and both acupuncturist and CHM practitioner) accounted for 80% of the TCM practitioners in Australia (CMBA 2017). The minimum requirement for registration is a Bachelor's Degree of 4 years in related fields in Australia. There are three public universities and three major private colleges offering programs approved by the Chinese Medicine Board of Australia (Zheng 2014). Moreover, acupuncture has been included under Medicare, Australia's national health insurance system since 1984 (Wardle, Sibbritt & Adams 2013a).

1.5 The significance of arthritis care

1.5.1 Definition of arthritis

Arthritis comprises more than 100 medical conditions that affect the musculoskeletal system, with arthritis-related symptoms such as pain or aching, stiffness, inflammation or redness, and damage to joint cartilage (Access Economics 2007; CDCP 2017). Arthritis is a leading cause of pain, disability and use of healthcare services in the US (Hootman & Helmick 2006). The US National Center for Disease Control estimated that 67 million people would be impacted by arthritis by 2030 (Hootman & Helmick 2006). The standardised death rate for arthritis and musculoskeletal diseases in Australia has increased from 4.3 per 100, 000 population in 1998 to 4.6 per 100,000 population in 2007. Of all deaths due to arthritis and musculoskeletal disease in 2007, 751 (69%) were females, predominantly in the 75 to 94 years old age group (Australian Bureau of Statistics 2007). RA and OA are the most common forms of arthritis and are the leading causes of disability amongst older adults in Australia (AIHW 2009; Hootman, Helmick & Brady 2012). People with arthritis may suffer not only from a lack of physical function but also mental and social problems (Yachoui & Kolasinski 2012). Specifically, people with arthritis experience a relatively poor health-related quality of life compared to those without arthritis (Havens et al. 2017).

1.5.2 Common arthritis types

The most common types of arthritis are OA and RA (Hootman, Helmick & Brady 2012).

1.5.2.1 Osteoarthritis

OA is a degenerative joint disease which frequently occurs in the hands, hips, and knees when the cartilage and bones within a joint start to break down, resulting in pain and limitation of movement (CDCP 2017; Manyanga et al. 2014). The main symptoms are significant pain and functional limitations which leads to impact on quality of life, even mental and physical distress (Zhang, Huang, et al. 2017). One in 11 Australians (9%) have OA, representing approximately 2.1 million people in 2014-15 (AIHW 2017b). It is estimated that 11% of the Australian population are predicted to suffer from OA by 2020 (Access Economics 2007). Women are more likely to have OA than men (2:1), and the prevalence of OA increases with age (AIHW 2017b; Busija et al. 2010). There are 30 million US adults affected by OA (CDCP 2017).

Moreover, it has been suggested that OA is strongly associated with reduced productivity and increased healthcare resource utilisation amongst the workforce as the onset of OA normally starts at an age when people are still working (Sharif et al. 2016). While OA is the major condition to knee and hip replacement surgery in Australia, the management of OA has involved a traditional approach to pain control, as well as interventions to improve functional movements and quality of life (AIHW 2017b; Shirley & Hunter 2015).

1.5.2.2 Rheumatoid arthritis

RA is autoimmune inflammatory arthritis characterised by the presence of destructive polyarthritis with a predisposition for affecting the peripheral joints, and it has a prevalence of 1% to 3% worldwide (Tokem et al. 2014; Wang et al. 2017). RA

is characterised by systemic and synovial inflammation and can lead to permanent joint damage and disability (Wang et al. 2017). Patients with RA have a higher mortality risk than the general population (van den Hoek et al. 2017), and women and the elderly are reported to be affected the most (Wang et al. 2017). RA is associated with a high degree of functional disability (Syngle et al. 2017).

In Australia, 2% of the population have self-reported RA in 2014-2015 which is approximately 407,900 people (AIHW 2017a; Jones, Nash & Hall 2017). There was a 72% rise in hospitalisations for people with RA from 2005-06 to 2015-16 (AIHW 2017a). While there is no cure for RA, treatment has improved to the point where many patients can achieve a normal quality of life (Jones, Nash & Hall 2017).

1.5.3 Conventional treatments for arthritis

Arthritis pain is common amongst patients with arthritis and pain management has to be tailored to the individual patient (Fitzcharles, Lussier & Shir 2010). Conventional treatments that focus on pain control related to arthritis include acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), narcotics and opiate analgesics and joint injections. The American Pain Society (APS) has recommended the use of acetaminophen (Tylenol) for mild to moderate arthritic pain (Reid, Shengelia & Parker 2012). NSAIDs are the preferred drugs for moderate to severe pain (Crofford 2013). When NSAIDs are used as long-term therapy for arthritis, there is a risk of gastrointestinal bleeding (Sostres et al. 2010). Narcotics and opiate analgesics can be safely used in treating patients with severe arthritis pain who are resistant to non-opioid medications (Rolita et al. 2013; Russell et al. 2014; Tehrani, Aguiar & Katz

2013). Corticosteroids or hyaluronic acid medications can be injected into the joint (Abdulla et al. 2013; Spaková et al. 2012).

There are three major methods for the management of arthritic patients: medication; non-pharmacological approaches such as self-management, physical or occupational therapy, weight loss, joint assistive aids; and surgery which has been recommended in the American College of Rheumatology guidelines (CDCP 2016; McAlindon et al. 2014; Singh et al. 2016). Conventional treatments for arthritis include protecting the joint from progressive joint degeneration, increasing joint movement, and providing pain control so that people with arthritis can maintain a healthy, active lifestyle (Bello & Oesser 2006).

When pain and disability from arthritis increase, surgery is an option (Hawker 2006). The most common surgeries undertaken for arthritis are arthroscopy and total joint replacement (Domb, Gui & Lodhia 2015; Higashi & Barendregt 2011). Arthroscopic surgery is sometimes recommended to repair or shave the cartilage or remove floating pieces of cartilage (Roster, Kreulen & Giza 2015) that may cause joint pain (Xu et al. 2013). In individuals with advanced OA, chronic pain, and marked limitation in joint mobility, total joint replacements can be very effective in helping an them resume an active lifestyle (Labek et al. 2011).

1.5.3.1 Conventional treatments for OA

Treatment choices for OA fall into four main categories: non-pharmacologic, pharmacologic, surgical, and CAM including TCM (Sinusas 2012). Non-pharmacologic therapies including exercise are encouraged throughout OA treatment, and a

systematic review has concluded that land-based therapeutic exercise provides short-term benefit amongst people with knee OA (Fransen et al. 2015). Pharmacologic treatments (pain and anti-inflammatory medications) include analgesics, NSAIDs, corticosteroids and hyaluronic acid, which are available as pills, syrups, creams or lotions, or as injections into a joint (Brand et al. 2009; Hochberg, Altman, April, et al. 2012). NSAIDs which is one of the most popular treatments used for OA can provide symptomatic relief for patients with OA due to its analgesic and anti-inflammatory properties (Barnes & Edwards 2005). Topical NSAIDs including trolamine salicylate and oral NSAIDs including COX-2 selective inhibitors have been recommended for the management of OA (Hochberg, Altman, April, et al. 2012). The most common medications prescribed, advised or supplied by GPs for OA are paracetamol (non-opioid analgesic), meloxicam (NSAID COX-2) and celecoxib (NSAID COX-2) (Helena et al. 2011). The most effective surgical intervention for OA is total joint replacement (Sinusas 2012) while controlled trials comparing many prosthetic devices are lacking (Sinusas 2012).

However, adverse effects from these conventional medications for OA have been noticed, such as gastrointestinal toxicity events from NSAIDs (Makris, Kohler & Fraenkel 2010), and allergic reactions from pain medications (Basedow et al. 2014). Patients are instructed to utilise these medications cautiously to avoid potential adverse effects which mainly involve the gastrointestinal (GI) tract, kidney, cardiovascular system, skin and respiratory tract (Harirforoosh, Asghar & Jamali 2014; Sinusas 2012). These adverse effects have led some healthcare professionals

to seek other options for the management of arthritis, such as CAM (Seed, Dunican & Lynch 2009).

1.5.3.2 Conventional treatments for RA

The aim of conventional RA treatment is to maximise long-term health-related quality of life through control of symptoms, prevention of structural damage, normalisation of function and social participation (Smolen et al. 2010). Conventional treatments used for RA include paracetamol, codeine, NSAIDs, to provide symptom relief and to slow the progression of RA (AIHW 2017a; Kanecki & Tyszko 2014). Corticosteroids, disease-modifying anti-rheumatic drugs (DMARDs) (such as methotrexate and sulfasalazine), biologic DMARDs are prescribed when insufficient symptom control obtained from the previously mentioned medications to reduce pain and inflammation, and prevent joint damage and reduce structural damage to the joints (De & Bala 2011). Surgery, physical therapy, modified exercise programs, and assistive devices are used to ease physical stress on the joints (De & Bala 2011). Unfortunately, DMARDs have been noticed to cause a series of side effects such as injection site reactions, gastrointestinal problems (ulcers and stomach bleeding), neutropenia, and serious infections (De & Bala 2011; Jones, Nash & Hall 2017). Moreover, corticosteroids are found to have numerous side effects including bone loss, increased susceptibility to infection osteoporosis, and peptic ulcer (De & Bala 2011).

1.5.4 Economic influences on arthritis care

The economic influences of arthritis care comprise direct costs, such as costs associated with over-the-counter medications, medical care, hospitals, research,

pensions and benefits, and indirect costs, such as premature mortality and chronic and short-term disability (Reginster 2002). Direct medical costs for RA include cost of DMARDs, NSAIDs, steroids, medicine to prevent adverse drug reactions, laboratory tests, radiology, and doctor consultation charges (Syngle et al. 2017). A recent study conducted in India, estimating the direct medical cost in RA patients, suggested that the average direct cost of medical treatment per prescription of RA per month is US$ 15.57. Out of which, 60.15% was consumed by the cost of medicine; laboratory tests and radiology were covered by about 37.94%, and 1.91% in consultation fee and ophthalmology costs (Syngle et al. 2017). In Australia, arthritis accounts for AUS$ 7.4 million out-of-pocket expenses for OA patients and AUD$ 36.9 million for the Australian government spent on meloxicam for managing OA in 2007 (AIHW 2010a). There were AUD$ 1.1 million out-of-pocket expenses for RA patients and AUD$ 2.5 million in cost for the Australian government associated with managing RA in 2007 (AIHW 2010a).

1.6 Overview of arthritis care provision and providers in Australia

Given the diversity of arthritis types and different treatment options, the following section provides a brief overview of each conventional and TCM/CAM modality typically used for arthritis management.

1.6.1 Conventional arthritis care providers

In Australia, the management of arthritis involves a variety of healthcare professionals based on specific aspects of care, including GPs, medical specialists (rheumatologists, orthopaedic surgeons, and geriatric medical specialists), and hospital staff (AIHW 2010b). Interestingly, clinical studies have identified that

medical care improves arthritis symptoms, providing that patients stick to their treatments (Fall et al. 2013). Studies have also shown early diagnosis and a well-managed arthritis care plan can produce better outcomes such as reducing disability and improving quality of life amongst patients with arthritis (Albers et al. 2001). As such, increased awareness in the community amongst health professionals for arthritis management, adequate referral systems, and access to rheumatology services are warranted.

1.6.1.1 General practitioners

GPs are normally the first healthcare providers consulted when people suffer from musculoskeletal disorders (Brand et al. 2010). GPs play an important role in arthritis care to avoid delaying diagnosis (Brand et al. 2010). When arthritis is suspected by the GP, patients will be referred to a rheumatologist to have a definitive diagnosis and to receive early treatments such as DMARDs (Lacaille et al. 2005).

1.6.1.2 Medical specialists

A series of tests may be conducted by rheumatologists and other related medical specialists to help confirm the type of arthritis, such as blood tests, tests on erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), anti-cyclic citrullinated peptide (anti-CCP), full blood count, rheumatoid factor, joint imaging, and pathogenesis (De & Bala 2011). A large number of referrals from GPs regarding RA are to rheumatologists, as reported in the Bettering the Evaluation and Care of Health (BEACH) survey in 2008-2009 (AIHW 2010b). Moreover, it is recommended that rheumatologists should be involved in arthritis treatment and review the

treatment plan as studies have shown improvement in the quality of arthritis care and outcomes when rheumatologists are continually involved in the arthritis treatments (Lacaille et al. 2005; MacLean et al. 2000).

Orthopaedic surgeons are involved in the treatment of arthritis. Orthopaedic interventions are grouped by three types, including major joint replacement (hip, knee and other major joints replacement); intermediate joint surgery (wrist/hand, ankle/subtalar/foot, femoral neck fixation surgery); and tendon and minor surgery (hand/wrist tendons, carpal tunnel decompression, knee and other minor surgery) (James et al. 2004).

1.6.1.3 Allied health professionals

The management of arthritis provided by allied health professionals such as physiotherapists, podiatrists, and hydrotherapists, is often focused upon helping people with arthritis improve joint function and develop self-care skills (AIHW 2010b). Physiotherapists who manage arthritis patients utilise exercise, physical modalities, massage, manual therapy, balneotherapy and patient education (Hurkmans et al. 2011; McKenzie & Torkington 2010). Allied health services (particularly physiotherapy) are the second most frequently referred to provider by a GP for OA, preceded by medical specialists (AIHW 2010b). Based on the results from the BEACH program in Australia (2005-2010), 28% of GPs referred OA patients to physiotherapists amongst 1,578 GP referrals (Brand et al. 2014). In Australia, people with arthritis may consult allied health professionals directly or via a clinician's recommendation (AIHW 2010b).

1.6.1.4 Hospital staff

Hospital nurses have a close relationship with arthritis patients and communicate information about their patients with rheumatologists (Fall et al. 2013; Macdonald et al. 2008). The core part of nurses' work is to provide information on arthritis and provide emotional support to patients (Fall et al. 2013). After diagnosis, a rheumatology nurse can educate patients with arthritis about their arthritis and how to manage their condition on a day-to-day basis (Fall et al. 2013; Grønning, Midttun & Steinsbekk 2016). In addition, as new biologic agents (e.g. anti-TNF-α) have been considered to improve arthritis management (RA), nurses have to ensure patients with arthritis are able to self-inject (Fall et al. 2013). Moreover, nurses can direct patients with arthritis to other helpful resources, such as information on arthritis provided by the Arthritis Foundation, as well as community contacts.

1.6.2 Complementary and alternative medicine arthritis care provision and providers

As mentioned previously in Section 1.3, it is common for people with arthritis to use CAM. The most popular types of CAM provision and providers used for arthritis are discussed below. Moreover, as one of the most popular CAM types for arthritis, TCM will be introduced separately in Section 1.6.4.

1.6.2.1 The role and practice of massage therapy for arthritis

Massage is defined as a systematic manipulation of the soft tissues of the body with rhythmical pressure and stroking to prevent, develop, maintain, rehabilitate, or augment physical function or relieve pain, with one or more of actions such as effleurage, petrissage, friction, tapotement and vibration (Bervoets et al. 2015).

Massage therapy is one of the most popular CAM therapies for managing arthritis symptoms such as pain and functional status (Nelson & Churilla 2017). Studies have shown massage can be used to help manage pain and fatigue in patients with RA and improve the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) global scores in patients with OA (Metin & Ozdemir 2016; Perlman et al. 2012).

1.6.2.2 The role and practice of vitamins/minerals for arthritis

Many patients with arthritis take vitamins/minerals in addition to their conventional medications (Alaaeddine et al. 2012; Yang et al. 2013). Glucosamine and omega-3 fish oils are the most commonly used supplements for people with OA and RA, followed by calcium, chondroitin and vitamin D (AIHW 2010b).

Glucosamine is a naturally occurring amino-monosaccharide which constitutes glycosaminoglycan and other proteoglycan found in the synovial fluid and articular cartilage of joints (Tabassi & Garnero 2007). As such, glucosamine was believed to be of importance in increasing synovial fluid availability and maintaining joint lubrication (Sanders & Grundmann 2011). Unfortunately, studies have shown no benefits from glucosamine or fish oil on pain or in reducing the structural progression of arthritis (Shirley & Hunter 2015). However, glucosamine may reduce side effects when it was used concurrently with other pain medications amongst people with OA (Sanders & Grundmann 2011). Further research is needed to investigate the effectiveness of dietary supplements for arthritis.

1.6.2.3 The role and practice of yoga/meditation for arthritis

Yoga comprises a wide range of mind and body practices, from postural and deep breathing exercises to deep relaxation and meditation, which is a systematic practice and implementation of mind and body in the living process of human beings to keep harmony within self, within society, and within nature (Sharma 2014). Yoga can be important for arthritis management as it provides physical relief by stretching the muscles around the affected joints and reduces stress by providing spiritual solace (Sharma 2014).

Moreover, systematic reviews have suggested that yoga may be a useful therapy for arthritis (Field 2016; Sharma 2014; Siegel et al. 2017). Specifically, yoga may be effective in reducing OA pain from the stimulation of pressure receptors (Field 2016).

1.6.2.4 The role and practice of homeopathy for arthritis

Homeopathy was developed by the German physician Samuel Christian Hahnemann (1755 – 1843) in the eighteenth century (Jonas, Linde & Ramirez 2000). Homeopathy has become one of the CAM forms addressing the physical, mental, emotional, and spiritual parts of a person's illness, in order to explore a complete narrative of the patients' experience (Brien, Leydon & Lewith 2012). Moreover, patients with arthritis were more frequently treated with primary care practices who used homeopathic practices in 2000 (Jonas, Linde & Ramirez 2000).

From a recent qualitative study comprising 16 participants with RA who had homeopathic consultations, results showed that homeopathic consultations enable RA patient to cope better in a number of ways, such as increasing awareness of self,

receiving emotional support, and improving the sense of coping RA (Brien, Leydon & Lewith 2012). However, clinical research on homeopathy for arthritis is limited (NHMRC 2014). Further studies on high-quality evidence on homeopathy for arthritis are needed.

1.6.2.5 The role and practice of chiropractic/osteopathy for arthritis

According to Association of Chiropractic Colleges, chiropractic emphasises the inherent recuperative power of the body to heal itself without the use of medicine or surgery, with the focuses on the relationship between structure (primarily the spine) and function (as coordinated by the nervous system) and how that relationship affects the preservation and restoration of health (Hart 2016).

Chiropractors may be able to help people with RA/OA improve joint functioning and develop self-care skills (AIHW 2010b). Specifically, patients with hip OA were studied, and it was shown that chiropractic care may have a short-term benefit in the reduction of hip pain (Thorman, Dixner & Sundberg 2010). However, the research on the efficacy of chiropractic for arthritis is limited which warrants further studies.

1.6.3 Traditional Chinese medicine arthritis care provision and providers

In TCM theory, arthritis is typically diagnosed as *Bi* syndrome. There are different patterns of *Bi* syndrome, such as Wind-Cold-Damp *Bi*, Wind-Damp-Heat *Bi*, Phlegm and Blood Stagnant *Bi*, and Deficiency *Bi* (Zhang et al. 2008). Patients are classified as having particular *Bi* syndrome pattern and then treated with CHM or acupuncture to decrease inflammation and restore the affected system (Pan et al. 2017).

1.6.3.1 The role and practice of acupuncture for arthritis

Generally, the forms of acupuncture for arthritis include needling without any electrical stimulation, and conduction of electricity through all the needles (Selfe & Taylor 2008). Based on a TCM diagnosis for people with arthritis, acupuncture has been used for selected acupoints by acupuncturists as it is regarded to have effects on the human autonomic nervous system (Seca et al. 2016). Systematic reviews and meta-analyses have suggested that acupuncture is an effective and safe therapy for patients with gouty arthritis (Lu et al. 2016), OA (Lin et al. 2016), and RA (Li et al. 2016).

Moreover, acupuncture has been shown to provide an improvement in function and pain relief when it is incorporated with conventional medicine for symptoms related with OA and RA (Berman et al. 2004; Casimiro et al. 2005; Mavrommatis et al. 2012). Specifically, a 3-armed, randomized, placebo-controlled trial conducted in Greece in 2011, showed acupuncture with etoricoxib (one of the NSAIDs for OA) is more effective for OA of the knee than both etoricoxib alone or sham acupuncture with etoricoxib amongst 120 patients (Mavrommatis et al. 2012).

1.6.3.2 The role and practice of Chinese herbal medicine practitioners for arthritis

In TCM theory, patients with arthritis are classified as having a particular TCM syndrome based on their symptoms and then treated with CHM by restoring the affected system (Pan et al. 2017). There are several CHM for the treatment of arthritis, either as a single herb or a mixture of herbs such as *Tripterygium wilfordii,*

GuiZhi-ShaoYao-ZhiMu Decoction, *Tripterygium wilfordii Hook F,* having been identified to be an effective and safe treatment for arthritis (Wang et al. 2017). Moreover, a single herb or a mixture of herbs comprises decoctions, whole plants, plant extracts and patented formulas, all of which can be given as a single herb or a mixture of herbs (Pan et al. 2017).

From a recent population study conducted in Taiwan, *Shang-Jong-Shiah-Tong-Yong-Tong-Feng-Wan* and *Rhizoma Corydalis* were the most commonly prescribed CHM amongst patients with RA (Huang et al. 2015). Moreover, a recent systematic review shows *Duhuo Jisheng* decoction combined with conventional medicine to be potentially beneficial for knee OA (Chen et al. 2016). However, systematic reviews evaluating CHM on arthritis often fail to meet expected methodological criteria as high-quality evidence is limited (Pan et al. 2017).

1.7 Chapter summary

This chapter has provided an overview and detailed background knowledge regarding the wider context of TCM/CAM use, arthritis care, TCM regulation in Australia, and current evidence on TCM/CAM in arthritis management. The treatments of conventional and TCM/CAM in arthritis care are also described. This chapter has highlighted a lack of TCM use as well as TCM users with arthritis in Australia, which is a significant important public health and health service issue.

Chapter 2 LITERATURE REVIEW

This chapter provides a critical review of the recent international literature regarding the use of TCM/CAM by people with arthritis including the prevalence of TCM/CAM use on arthritis; the characteristics of TCM/CAM users for arthritis; cost for arthritis TCM/CAM users; the motivation and decision-making upon TCM/CAM use amongst people with arthritis, perceived benefits from TCM/CAM use amongst people with arthritis and communication between TCM/CAM users and healthcare providers regarding arthritis management.

This chapter provides a comprehensive understanding of the peer-reviewed literature from 2008 to 2015 regarding the use of TCM/CAM amongst people with arthritis. Research gaps over this topic are also identified for further exploration.

2.1 Use of complementary and alternative medicine amongst people with arthritis

2.1.1 Introduction

This critical review focusing on TCM/CAM use amongst people with arthritis has been published in *Rheumatology International*.

Yang, L., Sibbritt, D. and Adams, J. (2017). A critical review of complementary and alternative medicine use among people with arthritis: a focus upon prevalence, cost, user profiles, motivation, decision-making, perceived benefits and communication. *Rheumatology International*, 37(3), pp. 337-351.

2.1.2 A critical review of complementary and alternative medicine use among people with arthritis: a focus upon prevalence, cost, user profiles, motivation, decision-making, perceived benefits and communication

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Rheumatology INTERNATIONAL

REVIEW ON HEALTH SERVICES

A critical review of complementary and alternative medicine use among people with arthritis: a focus upon prevalence, cost, user profiles, motivation, decision-making, perceived benefits and communication

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Abstract A critical review of complementary and alternative medicine (CAM) use among people with arthritis was conducted focusing upon prevalence and profile of CAM users as well as their motivation, decision-making, perceived benefits and communication with healthcare providers. A comprehensive search of peer-reviewed literature published from 2008 to 2015 was undertaken via CINAHL, Medline and AMED databases. The initial search identified 4331 articles, of which 49 articles met selection criteria. The review shows a high prevalence of CAM use (often multiple types and concurrent to conventional medical care) among those with arthritis which is not restricted to any particular geographic or social-economic status. A large proportion of arthritis sufferers using CAM consider these medicines to be somewhat or very effective but almost half do not inform their healthcare provider about their CAM use. It is suggested that rheumatologists and others providing health care for patients with arthritis should be cognizant of the high prevalence of CAM use and the challenges associated with possible concurrent use of CAM and conventional medicine among their patients.

Keywords Alternative therapies · Arthritis · Complementary and alternative medicine · Complementary therapies · Osteoarthritis · Rheumatic arthritis

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Introduction

Arthritis is a leading cause of pain, disability and health services utilization in many countries with more than 21% of US adults (46.4 million persons) and 3.85 million Australians being doctor-diagnosed with arthritis [1, 2]. The National Center for Disease Control and Prevention estimates that 67 million people will be impacted by arthritis in the US by 2030 [3]. Arthritis, which comprises over 100 different diseases and conditions that affect joints, the surrounding and other connective tissues, has no simple cure. Osteoarthritis (OA) and rheumatoid arthritis (RA) are the two most common forms of arthritis and are the leading causes of disability among older adults [4, 5]. Arthritis not only limits physical function but affects emotional, social and spiritual well-being [6].

The use of complementary and alternative medicine (CAM)—incorporating a range of practices and products not traditionally associated with the medical profession or medical curriculum and including acupuncture, traditional Chinese medicine, naturopathy and massage among other modalities and treatments [7]—is extensive in many countries. CAM use is particularly popular for chronic disease patients [8–10]. Approximately 24% (1.3 million) of Australian adults with a chronic condition regularly employ CAM as part of their treatment [11], and coping with arthritis is among the top five most common reasons why US adults seek CAM treatment [12, 13].

There is emerging but still ad hoc, and in most cases low-level, evidence for the efficacy of various CAM in treating arthritis [6, 14]. Trials have shown statistically significant and clinically relevant benefits for people with OA and RA using acupuncture [15, 16]. Moreover, early work suggests herbal medicine use may result in improvement

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in morning stiffness, walking time and joint swelling among RA patients [17], and use of Cat's Claw (*Uncaria tomentosa* and *Uncaria guianen*) extract appears to result in fewer painful joints compared to placebo among RA patients [18] as well as pain reduction and improved function [19]. Recently, a systematic review concluded that traditional Chinese herbal patches may improve effectiveness for OA [20]. Early pilot work on yoga use for OA shows possible reduction in pain and functional disability [21], and more recent research has provided encouraging evidence that some CAM (mind–body therapies such as Tai Chi) may confer benefits to people with chronic rheumatic conditions [6]. Nevertheless, further prospective trials are needed, and current evidence regarding efficacy of various CAM modalities for arthritis remains highly limited and inconsistent [22].

CAM use is a significant public health and health services research issue [23–25] and more recently has been identified as representing both important opportunities and challenges for the care of those with chronic illness including arthritis [26]. Yet, until recently there has been no coordinated program of public health and health services research focused upon CAM use for arthritis and the most contemporary review of this topic conducted in 2008 was restricted to examining only epidemiological studies [27]. Given the contemporary popularity and significance of CAM use among those with chronic illness such as arthritis, it is important that all up-to-date empirical findings on this topic be assessed with a view to helping inform safe, effective and coordinated care. In direct response to this research gap, this paper reports findings from a critical review of academic literature from the last seven years (2008–2015) with a focus upon key aspects of CAM use and users for arthritis.

Method

Search strategies

The review sought to identify all peer-review literature reporting CAM use in relation to a broad definition of arthritis including rheumatoid arthritis, osteoarthritis, gout, fibromyalgia and spondylarthritis. Three databases (MEDLINE, CINAHL and AMED) were searched employing the following keywords: ('arthritis' OR 'rheumatoid' OR 'osteoarthritis' OR 'fibromyalgia' OR 'spondylarthritis' OR 'gout') AND ('complementary and alternative medicine' OR 'CAM' OR 'complementary medicine' OR 'complementary therapy' OR 'alternative medicine' OR 'alternative therapy' OR 'acupuncture' OR 'homeopathy' OR 'osteopathy' OR 'traditional Chinese medicine' OR 'TCM' OR 'aromatherapy' OR 'naturopathy' OR 'massage' OR 'dietary supplement' OR 'meditation' OR 'herbal medicine' OR 'herbal' OR 'natural'). An additional search for relevant studies was undertaken using Google Scholar, as well as additional searches of bibliographic references in the literature already identified from the search.

Selection criteria

All identified articles were imported into EndNote X7 with duplicated results removed. The search was limited to peer-reviewed literature with abstracts published from 2008 to 2015 and which reported new empirical findings regarding aspects of CAM use among those with arthritis. Articles identified as editorials, correspondences, commentaries, case reports and writings that did not adopt systematic research design or data reporting procedures, as well as those reporting results from clinical studies (including clinical trial designs), were all excluded (Fig. 1).

Search outcomes

Forty-nine articles meet the inclusion criteria and were divided into two categories (Table 1): those papers reporting from studies with a large sample size of 500 or above and those reporting from studies with a small sample size below 500 subjects.

Quality appraisal

In order to appraise the quality of the review articles, a quality scoring system (Table 2) previously employed to assess CAM use literature for neck pain [28], among cancer patients [29, 30], headache and migraine patients [31] and women with menopause [32] was adopted.

Results

The data reported in the 49 reviewed articles were extracted, grouped and summarized using a critical review approach. The data extracted were synthesized into five themes: 'prevalence and cost of CAM use,' 'the profile of CAM users,' 'type and timing of CAM use,' 'motivations, information sources and perceived benefits of CAM use' and the 'relationship and communication with healthcare providers regarding CAM use.'

Prevalence and cost of CAM use

This review identified 49 papers reporting CAM use among people with arthritis from 2008 to 2015 in 12 countries. A wide variety of different types of CAM use have been reported among people with arthritis, with CAM

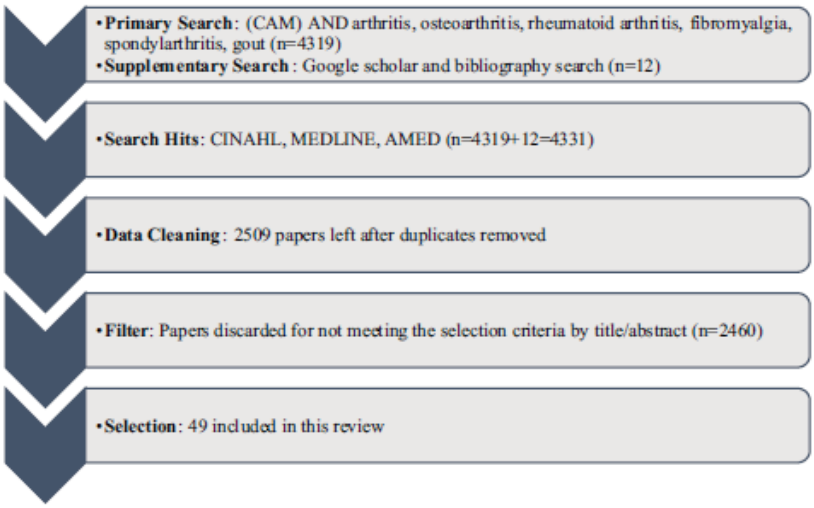

Fig. 1 Flowchart of the literature search process. *CAM, complementary and alternative medicine

supplements (such as glucosamine/chondroitin, methylsulfonylmethane (MSM), S-Adenosyl methionine, herbs, vitamins) and massage therapy the most popular among people with OA [33–38]. Thirty-one of the 49 articles reported the prevalence of CAM use among people with arthritis, including 14 articles reporting the prevalence of CAM use among people with only OA, and eight articles reported the prevalence of CAM use among people with only RA. Fifteen articles drew upon large samples ($n \geq 500$) to report prevalence rates for CAM use [7.5–95%] (mean, 53.0%; median, 46%). Meanwhile, the prevalence rates reported in another 16 articles drawing upon small samples ($n < 500$) ranged from 23.9 to 82% (mean, 55.1%; median, 57%).

The reviewed literature shows the costs of CAM use among people with arthritis vary between countries. In Korea, the mean total spending on CAM post-RA diagnosis was US$1907 within 12 months [39]. Meanwhile, CAM use expenses accounted for 3% of the total healthcare cost among people with OA in the US [40] and results from a New Zealand longitudinal observational study showed the total costs at baseline related to gout therapy as higher among CAM users when compared to non-CAM users (mean [SD] cost per month NZ$35.7 [NZ$69.0] vs. NZ$7.1 [NZ$22.8]) [41]. This same study showed that for those participants reporting CAM use, the mean expenditure on CAM treatments was NZ$29.10 (US$23.27) per patient per month. Meanwhile, a study in Canada showed the majority of patients with OA (45.4%) who use CAM spend less than CAN$25 per month, 25.9% spend CAN$25–$50 per month, 15.7% spend CAN$50–100 per month and 12.9% spend greater than CAN$100 per month on CAM [36].

The profile of CAM users

While some studies report higher CAM use by women with arthritis compared to men with arthritis either as an exclusive treatment or concomitantly with conventional medicine [33–35, 42–47], other research reported no significant gender differences in arthritis-focused CAM consumption [37, 48–50] and one paper reported higher CAM use by men with gout [41]. With regard to overall CAM use for arthritis, the literature suggests specific treatments and activities may vary among women and men. For example, a US study found women with RA had tried more types of CAM (ever use) than men [51], and in the same study, women were more likely to use heat treatments and less likely to consult a chiropractor than men participants [51].

Several studies report ethnic differences with respect to CAM use for arthritis [35, 52, 53]. According to a study from the US [35], African-Americans with OA were less likely to use CAM compared to non-Hispanic whites. Meanwhile, other US research [52] shows African-Americans with arthritis are more likely to use only conventional care rather than both CAM and conventional care. This study also identified those using only conventional medicine as more likely than those using both forms of health care to be African-American and less likely to be Asian or other (e.g., White), while those using neither form of care were more likely to be African-American, Asian or Hispanic. Moreover, African-Americans with knee OA were less likely to use either CAM alone or CAM and conventional treatments concurrently, compared to non-Hispanic white women and men with knee OA [35]. This result is also supported by a separate large population study which identified CAM as less likely to be used by

Table 1 Research-based studies of CAM use for patients with arthritis 2008–2015

Year	Country	Authors	Research focus	Arthritis types	CAM modality	Method	Sample size
2008	USA	Sleath and Callahan et al.	Prevalence, profile, frequency, disclosure	Arthritis (RA, fibromyalgia and OA)	Alternative health providers or therapists, special diets or food plans, vitamins, herbs or other supplements taken by mouth; rubs, lotions, copper bracelets or magnets or other body treatments used; movement activities; spiritual, relaxation or mind–body activities	Self-report questionnaire survey	1063
2008	USA	Sleath and Cahoon et al.	Prevalence, users' profile, concurrent use	OA	Vitamins or minerals; herbs, mixtures, or other supplements; rubs, lotions, liniments, creams, or oils; spiritual, relaxation, or mind–body activities; other body treatments; and movement activities	Self-report questionnaire survey	557
2008	USA	Barnes	Prevalence	Musculoskeletal problems—including back pain, neck pain, joint pain or stiffness or other joint condition, arthritis	36 types of CAM, e.g., non-vitamin, non-mineral, natural products and chiropractic or osteopathic manipulation	Data from National Health Interview Survey	31,044
2008	Canada	Sirois Fuschia M.	Prevalence, Types of CAM, Concurrent use	Arthritis (RA, fibromyalgia and OA)	Chiropractic, massage therapy, natural/homeopathy, acupuncture, other CAM	Cross-sectional international survey	140
2008	Korea	Lee et al.	Prevalence, information sources, perceived benefits/effectiveness, types of CAM, disclosure and cost/expenditure	RA	Traditional Oriental medical treatment, plant- and animal-derived over-the-counter healthcare products, used manual therapies	Questionnaire interview	153
2009	USA	Callahan et al.	Prevalence, profile and types of CAM	Arthritis: OA, RA, fibromyalgia and chronic joint symptoms	Alternative providers, special diets, vitamins and minerals, supplements, ointments or topical rubs, body treatment, spiritual and mind–body therapies	Family medicine research network and musculoskeletal database survey	2140
2009	Canada	Marsh et al.	Prevalence, communication/disclosure, polypharmacy/concurrent use and reasons for CAM use, duration of disease, cost	OA	Herbal medication, alternative practitioner, osteopathic doctor, chiropractor, massage therapist	Cross-sectional observational, questionnaire survey	373

Table 1 continued

Year	Country	Authors	Research focus	Arthritis types	CAM modality	Method	Sample size
2009	Mexico	Alvarez-Nemegyei et al.	Prevalence, profile, types of CAM	Rheumatic disease: RA, systemic lupus erythematosus, fibromyalgia, knee OA	Biologically based practices, food supplements, mind–body medicine, whole medical systems, manipulative and body-based practices and energy medicine	Personal interview survey	445
2009	Sweden	Klingberg et al.	Prevalence, types of CAM, users' profile	Inflammatory rheumatic diseases: polyarthritis, spondyloarthritis, systemic rheumatic diseases, vasculitis and miscellaneous. Rheumatoid arthritis. Osteoarthritis, gout and tendonitis	Biologically based practices, food supplements, mind–body medicine, whole medical systems, manipulative and body-based practices and energy medicine	Questionnaire survey	200
2009	UK	Hughes	Perceived benefits/effectiveness	RA	Acupuncture	In-depth interviews	13
2010	Turkey	Unsal and Gozum	Prevalence, profile, types of CAM, perceived benefits/effectiveness, type of arthritis, disease duration	Arthritis: OA, RA, ankylosing spondylitis, fibromyalgia, gout, systemic lupus erythematosus and/or other types of arthritis	Thermal therapies, oral herbal therapies, hot therapies, externally applied therapies, massage and cold therapies	Questionnaire	250
2010	USA	Efthimiou et al.	Prevalence, profile, types of CAM	RA	Mind–body techniques, martial arts, touch therapy, herbs and supplements	Longitudinal registry data analysis	166
2010	Australia	Adams et al.	Prevalence	Chronic conditions: arthritis (RA, OA, other arthritis), diabetes, asthma, etc.	Oral CAM	Telephone and written questionnaires	648
2010	USA	Weigel et al.	Prevalence of chiropractic use, types of CAM	The health conditions: arthritis, cancer, any heart condition, diabetes, lung disease, hip fracture, or hypertension	Chiropractic	Data from survey	806
2011	Australia	Armstrong et al.	Prevalence, profile, concurrent use	Chronic illness: asthma, diabetes, arthritis, osteoporosis, heart or circulatory condition	Vitamin/mineral supplements or natural/herbal remedies	National Health Survey Data	7805
2011	Australia	Sibbritt et al.	Prevalence	The conditions included arthritis, diabetes, heart disease, hypertension, low iron, asthma and cancer	Acupuncture	Questionnaire survey	11,200

Table 1 continued

Year	Country	Authors	Research focus	Arthritis types	CAM modality	Method	Sample size
2011	India	Jadhav et al.	Prevalence, types of CAM, disclosure, reasons for CAM use, effectiveness	OA and RA	Ayurveda, massage, yoga asana, homeopathy	Observational questionnaire interview	60
2011	Nigeria	Obalum and Ogo	Prevalence and profile, types of CAM use, reasons of CAM use	OA	Herbal products, local embrocation and massage, spiritual methods	Descriptive questionnaire Interview	164
2011	USA	Rispler et al.	Prevalence and disclosure	OA	Herbal, nutritional and megavitamin supplementation	Questionnaire survey	50
2012	Lebanon	Alaaeddine et al.	Prevalence, arthritis status, concurrent use and effectiveness/perceived benefits	RA and OA	Herbal medicine, exercise, massage, acupuncture, yoga and dietary supplement	Cross-sectional questionnaire-based interviews	250
2012	Turkey	Ulusoy et al.	Prevalence, profile, information sources, motivation, perceived benefits	Rheumatic disease: osteoarthritis, fibromyalgia, chronic low back pain, and neck pain, rheumatoid arthritis, spondyloarthropathies, connective tissue diseases, vasculitis, and familial Mediterranean fever	Acupuncture; biofeedback; dietary modifications; body-based practices; magnetic or copper devices; behavioral methods	Face-to-face questionnaire interview	318
2012	UK	Asprey et al.	Qualitative study, Effectiveness/perceived benefits	Knee OA	Acupuncture	Semi-structured open questions interview	16
2012	UK	Brien et al.	Qualitative study, Effectiveness/perceived benefits	RA	Homeopathy consultation	In-depth face-to-face interview	16
2012	USA	Cheung Corjena	Profile, types of CAM use, concurrent use, reasons of CAM use, perceived benefits, information sources, communication	Arthritis	Nutritional supplements, self-help modalities including plant-based creams and ointments, chiropractic, acupuncture, massage therapy, mind–body interventions such as prayer	Face-to-face audio recording discussion meeting	27
2012	USA	Wallen and Brooks	Information sources, disclosure	Rheumatic disease: OA, RA, arthritis, other	CAM practitioner consultation	Face-to-face interview	109
2012	USA	Hoerster et al.	Prevalence, and profile, concurrent use	Adults with provider-diagnosed arthritis—excluding those with only fibromyalgia, gout, lupus or rheumatoid arthritis	Natural products, deep breathing exercises, chiropractic or osteopathic manipulation, meditation, massage, yoga, progressive relaxation, diet-based therapies	National Health Interview Survey Data	3850

Table 1 continued

Year	Country	Authors	Research focus	Arthritis types	CAM modality	Method	Sample size
2012	USA	Lapane, Sand et al.	Prevalence, profile, types of CAM, concurrent use	Knee OA	Alternative medical system; biologically based therapies; manipulative and body-based therapies; mind–body therapies; and energy healing therapies	Interview questionnaire survey	2679
2012	USA	Jawahar et al.	Prevalence, profile, types of CAM	Knee OA	Alternative medical systems, mind–body interventions, manipulation and body-based methods, energy therapies, and biologically based therapies	Data from Osteoarthritis Initiative survey	2679
2012	The Netherlands	Hoogeboom et al.	Prevalence	Hip or knee OA	Alternative medicine, supplement use	Questionnaire	1002
2012	USA	Zodet & Stevans	Prevalence of Chiropractic use	Health indicators (Arthritis, high blood pressure, stroke, etc.)	Chiropractic	Data from the Medical Expenditure Panel Survey	5062
2012	USA	Gore et al.	Prevalence, profile, cost	OA and chronic low back pain	Acupuncture, hydrotherapy, massage, physical therapy, heat/cold application, chiropractic, osteopathic	Data from the LifeLink™ Health Plan Claims Database	112,951
2012	USA	Yang et al.	Prevalence, profile, types of CAM	Knee OA	Alternative medical systems, mind–body interventions, manipulation and body-based methods, energy therapies and three types of biologically based therapies	Interview survey	3850
2012	Denmark	Poulsen et al.	Prevalence	Knee OA	Chiropractic	Patient records	2000
2013	Australia	Yen et al.	consultations with CAM practitioners by older Australians	Chronic conditions: arthritis, etc.	CAM practitioner consultation	Survey	520
2013	India	Bhalerao et al.	Prevalence, profile, communication, reasons for CAM use, satisfaction	Chronic disease: epilepsy, HIV, RA and diabetes mellitus (DM)	Ayurveda, massage, yoga asana, homeopathy	Cross-sectional questionnaire-based interview	650
2013	USA	Lapane et al.	Prevalence, profile, types of CAM use, effectiveness/perceived benefits	Knee OA	Alternative medical systems, mind–body interventions, manipulation and body-based methods, energy therapies, biologically based supplements biologically based diet	Data from the Osteoarthritis Initiative	2675

Table 1 continued

Year	Country	Authors	Research focus	Arthritis types	CAM modality	Method	Sample size
2013	USA	Yang et al.	Prevalence, profile, concurrent use, types of CAM	Knee OA	Alternative medical systems or energy therapies, mind–body interventions, manipulation and body-based therapies, biologically based diet, biologically based topical agents, biologically based supplements	Survey	1121
2014	China	Xu et al.	Prevalence, cost	RA	Traditional Chinese medicine	Data from Interview	829
2014	Switzerland	Simoes-Wust et al.	Prevalence	Chronic disease: migraine, arthritis, depression, and constipation, etc.	Acupuncture, homeopathy, phytotherapy, Shiatsu/food reflexology, autogenic training/hypnoses, neural therapy, TCM, anthroposophic medicine, bio-resonance, Indian medicine, osteopathy	Self-reported data	3333
2014	Taiwan	Chen et al.	Prevalence, profile and types of CAM	OA	Chinese herbal medicine	Medical record from National Health Insurance Research Dataset	20,059
2014	Turkey	Tokern et al.	Prevalence, profile and types of CAM	RA	Herbs taken orally, nutritional supplements, mind–body therapies	Descriptive cross-sectional questionnaire	594
2014	Australia	Basedow et al.	Prevalence, beliefs	OA	Fish/krill/omega oil, glucosamine, vitamin, chondroitin, minerals, herbal medicines	Survey questionnaire	650
2014	USA	Tamhane et al.	Prevalence, profile, types of CAM	RA	Food supplements, topical applications, activities, alternative care providers	Database registry analysis	855
2014	Canada	Sirois Fuschia M.	Prevalence, profile and effectiveness	Inflammatory bowel disease or arthritis (any forms)	Manipulative and body-based practices, energy medicine, and whole medical systems	Survey	170
2014	New Zealand	Chan et al.	Prevalence, profile, cost, effectiveness	Gout	Dietary supplements, herbal medicines, acupuncture, heat treatment, massage, spiritual healer, tropical ointments, aromatherapy, naturopathy, homeopathy, ayurvedic medicine	questionnaire	276
2014	USA	Cheung et al.	Prevalence, profile, reasons for CAM use, motivation, perceived benefits, disclosure	Arthritis	Orally ingested, mental/spiritual, topical applications, movement based, practitioner based	Descriptive qualitative using data collected from focus group method	50

Table 1 continued

Year	Country	Authors	Research focus	Arthritis types	CAM modality	Method	Sample size
2015	USA	Geisler et al.	Information sources, communication, decision-making	Arthritis	44 different kinds including orally ingested supplements, herbs and juices; mental/spiritual practices, topical applications; movement-based therapies, and practitioner-based modalities (e.g., acupuncture, energy healing, reflexology, massage)	Qualitative and quantitative, survey, data analysis	50
2015	India	Jaiswal et al.	Information sources, effectiveness, perceived benefits	Chronic illness: arthritis, etc.	Ayurveda, homeopathy, manual healing, acupuncture	Questionnaire-based survey	100
2015	Taiwan	Huang et al.	Prevalence, profile, TCM types	RA	Traditional Chinese medicine	National Health Insurance Research Database	25,263

African-Americans with knee OA compared to Caucasian Americans with knee OA [53].

A number of the reviewed papers report significant differences with regard to educational level among arthritis sufferers who use or do not use CAM. A US study [35] showed adults with OA with at least a college education were twice as likely to report CAM supplement use compared to those with a high school education or less. This finding appears consistent with other studies conducted in the US [42, 54] as well as studies in Sweden, Lebanon, Nigeria, Turkey and Canada [37, 43, 49, 50, 55]. In addition, a Canadian study [56] showed respondents with arthritis who had some college or university education were twice as likely to use CAM, and those who had a post-graduate education were almost three and a half times as likely to use CAM. On the other hand, two studies [48, 52] found that CAM users with arthritis in Turkey and the US, respectively, were more likely to have lower levels of formal education.

Type and timing of CAM use

A number of the reviewed papers show many people with OA only [33, 36, 37, 54], RA only [49] and broad definitions of arthritis [46, 47, 52] concurrently use both conventional medicine and CAM (prevalence between 16 and 63%) with CAM supplements being the most popular among study participants in many countries [33–37, 49, 50, 58–60]. Moreover, the multiple use of different types of CAM (more than one CAM used by the same patient) appears common among people with OA only [33, 34, 36, 54], RA only [51, 61] and broad definitions of arthritis [50, 56–59], with the average number of different CAM used per person for arthritis being of 1.52 in Canada [56] and 2.2 ± 1.5 in Mexico [59].

The literature provides limited information regarding when people with arthritis seek CAM in the context of their illness journey. A study from the Netherlands examining 1002 participants with early hip or knee OA reported 10% of participants used CAM in the earliest stage of the disease, and supplements were identified as the only healthcare type to have increased in use over the 2-year follow-up data among all participants groups [62]. A study describing longitudinal patterns of CAM use among 1121 older adults with OA showed the proportion of CAM use for people with OA decreased slightly from 51.8 to 47.6% at year 2 and to 47.1% at year 4 [33]. In terms of how long people use CAM to treat their arthritis, one Korean study shows most patients used CAM (for RA) within 12 months of the onset of RA (75%), half used CAM for 12 months or less (49%), 23% used CAM for 12–36 months and 28% used CAM for over 36 months [39]. Specifically, a large-scale study of traditional Chinese medicine (TCM) use among

Table 2 Description of quality scoring system for the CAM papers reviewed

Dimensions of quality assessment	Points awarded[a]
Methodology	
A. Representative sampling strategy	1
B. Sample size > 500	1
C. Response rate > 75%	1
D. Low recall bias (prospective data collection or retrospective data collection within the past 12 month)	1
Reporting of participants' characteristics	
E. Status, types of arthritis	1
F. Age	1
G. Ethnicity	1
H. Indicator of socioeconomic status (e.g., income, education)	1
Reporting of CAM use	
I. Definition of CAM or modalities provided to participants	1
J. Participants can name CAM therapies/modalities used (open question)	1
K. Use of CAM modalities assessed	1

Data adapted from Peng et al. [32]

CAM complementary and alternative medicine

[a] The maximum score is 11 points

25,263 patients with RA revealed that the interval between the confirmed diagnosis of RA and the first TCM visit was 23.4 month in Taiwan [63].

Motivations, information sources and perceived benefits of CAM use

One US study shows a range of factors may have important bearing upon arthritis sufferers' decision-making around CAM use including: a willingness by patients to take control of their health care; a desire of patients to try everything available; pressure from mass media and a perception that CAM is risk-free [61]. Meanwhile, a Korean study identified most CAM users as motivated by: expectations of CAM as providing complete recovery after several uses (42%); friends and family members (37%) and in belief the CAM could potentially reduce acute pain levels (16%). An Indian study of 60 patients with RA or OA identified 58% of participants who used CAM as reporting pain control as the most common reason for using CAM [57]. Similarly, a study of 279 Turkish patients with RA [60] emphasized that 96% of patients used CAM due to their pain, followed by morning stiffness (17.2%) and exhaustion and fatigue (15.4%). Research aimed at determining the pattern of CAM use among 164 OA patients in Nigeria [37] found a range of reasons for CAM use—a majority of CAM users (54.5%) expected a permanent cure which they perceived conventional medicine could not deliver, 48.5% perceived CAM as less expensive than prescribed medicine and 45.5% claimed CAM had no side effects.

A Korean study showed the most important sources of information guiding arthritis sufferers to use CAM were friends, family members and other relatives (49%); the patients' own opinion (30%); other patients (15%); mass media and books (6%); and medical specialist (4%) [36]. Furthermore, results from a study in Turkey [48] showed 49.2% of those with arthritis who used CAM heard about CAM from family members or relatives, neighbors or friends (31.6%), people with the same disease (20.8%), health professionals (12.8%) or media (4%). Finally, a study assessing information resources for CAM use among rheumatic disease patients in Turkey showed only 13.6% used CAM with the recommendation of their physician, while most were encouraged toward CAM use by their relatives (41.5%) and mass media (12.9%) [50].

In terms of the perceived benefits of CAM use among arthritis sufferers, 49% of a sample of Korean users considered CAM to be somewhat or very effective [39]. Likewise, a study focusing on CAM use among 250 Turkish people with arthritis [48] indicated that 50% of the CAM interventions used were reported to be somewhat or very effective, with heat therapies attracting the highest rate (79.2%), followed by massage (64.8%) and cold therapies (58.3%). Similarly, another study [43] examining CAM use among 200 Sweden patients with inflammatory rheumatic diseases showed that 66% of patients with experience of CAM use expressed positive benefit for their health. Moreover, in a study comprising of 250 people with RA or OA in Lebanon, patients perceived CAM as able to alleviate their symptoms and improve their disease status concerning pain, sleep and level of activity [49]. High patient

satisfaction of effectiveness of CAM use is also reported in a US study comprising 27 older women with arthritis [58]. Furthermore, a study conducted in India with 60 patients with OA (10) and RA (50) observed that patients with RA who frequently use CAM had an improved quality of life (QOL) and those using CAM alongside conventional therapy had better QOL as compared to those not using CAM [57]. Meanwhile, a study in Turkey showed only 26.5% of arthritis patients using CAM were satisfied with the outcomes of such use [50].

Communication with healthcare providers regarding CAM use

Most of the reviewed studies report that communication between people with arthritis and healthcare providers (HCP) can be affected by the relationship with HCP, HCP unsupportive attitudes and lack of knowledge about CAM as well as time-limited clinic visits [39, 44, 45, 49, 54, 64–66]. Studies report that patients may sometimes perceive CAM as topic not appropriate for discussion with a HCP [57, 58] even though a significant percentage of patients with arthritis (39.5–48%) expect to receive CAM information and to talk about CAM in consultation with their physician [50, 65].

It is worth noting that arthritis patients who are female, who use more types of CAM or who have higher levels of education have all been found to be significantly more likely to report telling their conventional health practitioners about their CAM use [35, 42, 54]. A study conducted in Canada, which assessed the level of communication regarding CAM use between people with OA and physicians, showed 40.6% of patients did not inform their orthopedic surgeon of their current CAM use [36]. Similar findings have been identified in other studies—39.6% of RA/OA sufferers who use CAM inform their physicians about their CAM use [49], only 28% of Korean OA patients who used CAM informed their doctor about such use [36] and 71% of arthritis patients from a study in India failed to inform their physician about their CAM use [57].

Appraisal outcomes

Forty-nine articles included in the review were assessed via the quality scoring system. Table 3 shows that the quality of research to date on this topic is constrained by some methodological limitations. According to the items listed in this quality assessment tool (Table 2), 25 articles did not report a response rate, and nine articles reported data collection subject to recall bias. Meanwhile, the sample sizes of 22 articles reporting quantitative research findings were less than 500, only six papers reported response rates and noted recall bias, and only one study included a sample size higher than 500 and a response rate of 75% or higher.

Discussion

This paper reports findings from the world's first comprehensive review of the literature focusing upon different aspects of CAM use among people suffering from arthritis. The review reveals a recent growth and intensification of research focus upon this topic (with 35 of the 49 articles identified published over the past 5 years) as well as a number of key findings of significance to arthritis sufferers and those managing and delivering their care including rheumatologists.

The empirical research identified in our review suggests substantial levels of CAM use among people with arthritis, with prevalence rates reported from 23.9 to 95%; this is a finding in line with the results of earlier work on this topic [13, 72] and highlights CAM use as a pertinent arthritis health services and health services research issue. However, disparities in research design, methodology (especially the inconsistencies of CAM definitions) and populations examined (all conditions/OA/RA) among the different studies were all challenges to the review process. For example, the definition of CAM differs among the studies and can change over time with some CAM modalities included in 'usual' care of arthritis patients. Therefore, it is possible that the estimates in various studies may have underestimated the prevalence of CAM use. Our review is confined to English language publications.

The review indicates high levels (≥50%) of satisfaction with CAM among those with arthritis who use these practices and medicines. This situation could be attributed to several factors including a frustration with conventional treatment among patients with regard to addressing their symptoms and patient perceptions of CAM as safer [49]. However, there is a need to further investigate the reasons for and duration of CAM use among arthritis' sufferers. Unfortunately, the majority of reviewed literature fails to specify whether reported CAM use is directly arthritis-related, and further research on this topic needs to provide more in-depth, precise examination of CAM use exclusively for arthritis.

Our review highlights that while many arthritis patients seek and gain information on CAM from non-professional sources, nearly half do not inform their doctor about their CAM use. Contemporary literature highlights a number of possible reasons for such a lack of disclosure regarding CAM use among arthritis patients including unsupportive HCP attitudes, HCP's lack of knowledge about CAM, time-limited clinic visits, as well as patient perceptions of the topic of CAM as inappropriate for discussion with a HCP [39, 44, 45, 49, 54, 57, 58, 64–66]. Meanwhile, given the high prevalence of CAM use among people with arthritis, it is imperative that conventional providers including rheumatologists be aware of CAM use [73] and enquire about such use within their routine consultations [74] in order to

Table 3 Quality score of studies on CAM use among people with arthritis (2008–2015)

First author/year	Dimensions of quality assessment			
	Methodology	Reporting of participants' characteristics	Reporting of CAM use	Total score
Lee et al. [44]	2 (C, D)	3 (E, F, H)	3 (I, J, K)	8
Sleath et al. [57]	3 (A, B, D)	4 (E, F, G, H)	2 (I, K)	9
Sirois [43]	1 (D)	4 (E, F, G, H)	1 (K)	6
Sleath et al. [66]	2 (A, B)	4 (E, F, G, H)	1 (I)	7
Alvarez-Nemegyei et al. [59]	2 (A, D)	2 (E, F)	2 (J, K)	6
Callahan et al. [47]	2 (B, D)	3 (E, F, H)	3 (I, J, K)	8
Marsh et al. [37]	2 (C, D)	4 (E, F, G, H)	3 (I, J, K)	9
Klingberg et al. [48]	2 (A, D)	2 (E, F)	3 (I, J, K)	7
Ünsal, Gözüm [53]	2 (C, D)	3 (E, F, H)	3 (I, J, K)	8
Efthimiou, Kukar [67]	1 (D)	2 (F, H)	3 (I, J K)	6
Rispler et al. [50]	2 (C, D)	4 (E, F, G, H)	3 (I, J, K)	9
Jadhav et al. [42]	1 (D)	3 (E, F, H)	2 (I, K)	6
Obalum, Ogo [39]	1 (D)	2 (E, H)	3 (I, J, K)	6
Armstrong et al. [52]	3 (A, B, D)	3 (E, F, H)	1 (I)	7
Hoerster et al. [55]	2 (B, D)	3 (F, G, H)	2 (I, K)	7
Lapane et al. [36]	2 (B, D)	4 (E, F, G, H)	2 (I, K)	8
Jawahar et al. [35]	3 (A, B, D)	4 (E, F, G, H)	3 (I, J, K)	10
Alaaeddine et al. [38]	2 (C, D)	3 (E, F, H)	3 (J, K)	8
Cheung [33]	1 (D)	4 (E, F, G, H)	3 (J, K)	8
Wallen, Brooks [63]	2 (C, D)	4 (E, F, G, H)	3 (I, J, K)	9
Brien et al. [68]	2 (A, D)	2 (E, F)	2 (I, J)	6
Gore et al. [45]	2 (B, D)	1 (F)	2 (I, K)	5
Ulusoy [40]	0 (0)	3 (E, F, H)	1 (I)	4
Yang et al. [56]	2 (B, D)	4 (E, F, G, H)	3 (I, J, K)	9
Yang et al. [34]	2 (B, D)	4 (E, F, G, H)	2 (I, K)	8
Cheung et al. [65]	1 (D)	3 (E, F, H)	2 (I, J)	6
Sirois [58]	1 (D)	3 (F, G, H)	3 (I, J, K)	7
Xu et al. [69]	1 (B)	2 (F, H)	1 (I)	4
Chen et al. [70]	1 (B)	1 (F)	0 (0)	2
Chan et al. [46]	1 (D)	3 (E, F, G)	2 (J, K)	6
Tokem et al. [41]	1 (B)	3 (E, F, H)	2 (J, K)	6
Tamhane et al. [54]	1 (B)	3 (E, F, G)	3 (I, J, K)	7
Basedow et al. [71]	2 (B, C)	3 (E, F, H)	2 (I, J)	7
Geisler, Cheung [64]	1 (C)	3 (F, G, H)	2 (I,J)	6
Huang et al. [62]	2 (A, B)	3 (E, F, H)	3 (I, J, K)	8

Hughes 2009 [76]; Hoogeboom, et al. [62]; Adams et al. 2010 [75]; Simões-Wüst et al. 2014 [77]; Weigel et al. 2010 [78]; Sibbritt et al. 2011 [79]; Barnes & Bloom 2008 [80]; Poulsen et al. 2012 [81]; Lapane et al. 2013 [82]; Asprey et al. 2012 [83]; Bhalerao et al. 2013 [44]; Yen et al. 2013 [84]; Jaiswal et al. [46]; Zodet & Stevans 2012 [85] do not focus solely upon CAM use for arthritis and, as such, the criteria 'reporting of CAM use for arthritis' do not apply to these 14 studies. As a result, these papers were not assessed via the quality scoring system outlined

A. Representative sampling strategy; B. Sample size > 500; C. Response rate > 75%; D. Low recall bias (prospective data collection or retrospective data collection within the past 12 month); E. Status, types of arthritis; F. Age; G. Ethnicity; H. Indicator of socioeconomic status (e.g., income, education); I. Definition of CAM or modalities provided to participants; J. Participants can name CAM therapies/modalities used; K. use of CAM modalities assessed

ensure safe, effective care. Early small-scale work on this topic suggests the regular application of a specific tool to identify CAM use among patients may lead to more accuracy and communication around CAM use [45], and this early work sets the foundations for further in-depth examination of this issue.

There are some limitations for this study. The first limitation is the definition of arthritis we have employed, we

have used a broad definition (including everything within musculoskeletal pain) in order to capture as much relevant arthritis literature as possible. Secondly, this research has focused exclusively upon English language databases and there is potential for future work to explore literature that may be available in language other than English. Our review reveals a number of gaps on this topic. There remains no quality, national data on CAM use among people with arthritis, and further enquiry is also needed to examine the finer details of CAM-related communication and disclosure among arthritis patients and their healthcare providers. Furthermore, the data identified in the literature for our review did not report doses of CAM treatments, and this is another area where further research can focus.

Conclusions

This review reveals wide and frequent CAM use among patients with arthritis, who perceive such use to be beneficial. Potential use of CAM, often concurrent to conventional medical care, is certainly an issue with which all providers including rheumatologists need to be cognizant, and there is a need for further research in this area to help to inform effective care and management for those with arthritis which is free from potential direct and indirect risks associated with CAM use.

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Compliance with ethical standards

Conflict of interest Lu Yang, David Sibbritt and Jon Adams declare that they have no conflict of interest.

Ethical approval This critical review article did not involve the authors undertaking any primary data collection/fieldwork. We (all authors) declare no conflicts of interest.

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2.2 Chapter summary

Chapter 2 reviews recent international literature regarding the use of TCM/CAM for arthritis. This chapter identifies a high prevalence of TCM/CAM use for people with arthritis, and that majority of arthritis sufferers are women. The chapter shows that most arthritis patients concurrently use TCM/CAM with conventional medicines, and report preference for the effectiveness of TCM/CAM use. However, only half of TCM/CAM users with arthritis communicate with their healthcare providers about such use which may lead to issues regarding potential drug interactions. This critical review also highlights significant research gaps in the area of multiple TCM/CAM modalities for the treatment of arthritis.

CHAPTER 3 METHODOLOGY

This chapter describes the research design and methodology employed in the PhD study. This research follows four main stages: 1) conducting a critical integrative review of existing literature on the use of CAM, including TCM, for arthritis; 2) conducting a quantitative empirical analysis of the use of TCM amongst women from the Australian Longitudinal Study on Women's Health (ALSWH); 3) conducting a quantitative empirical analysis of the use of TCM amongst women with arthritis from a sub-study of the 45 and Up Study; and 4) conducting a survey of TCM practitioners from PRACI to examine their perceptions of using TCM to treat patients with arthritis. Additional descriptions of the methodology used in each research paper are included in the respective section of Chapters 4.

3.1 Study design

3.1.1 The Australian Longitudinal Study on Women's Health (ALSWH)

ALSWH is a longitudinal population-based cohort study of over 50,000 Australian women (http://www.alswh.org.au). It was designed to investigate multiple factors affecting the health and well-being of women over a 20-year period (Brown et al. 1999).

Women in three age groups: 18-23 years (born 1973-78), 45-50 years (born 1946-51), and 70-75 years (born 1921-26) in 1996 were specifically selected in order to follow women through the key life stages, which are impactful on women's health and well-being (Brown et al. 1996). ALSWH began collecting information from the 1973-78 cohort when they were young women in the early stages of transition from late adolescence to full adulthood. Over time most of this group has moved into the

workforce, entered adult relationships, and many have become mothers. The middle-aged women, born 1946-51, were selected to examine chronic illnesses and the social and personal changes of middle age. The older women (born 1921-26) were selected when they were aged in their early 70s, an age when many were generally still active, involved members of the community. These women have been followed to obtain information on predictors of continuing well-being and independence in older adult life. The longitudinal study design enables changes in women's health to be measured over time and helps to identify possible cause-and-effect relationships amongst many variables (http://www.alswh.org.au).

3.1.1.1 Sampling

In April 1996, the Australian Medicare database, which contains the name and address details of all Australian citizens and permanent residents, was used to randomly select women in three age groups (18-23 years, 45-50 years and 70-75 years) to be invited to participate in the ALSWH. A total of 106,000 women were sent an invitation to participate in the survey. In order to enable statistical comparisons between numbers of women living in both rural and urban areas, women from rural and remote areas were sampled at twice the rate of women in urban areas. After removing invitations that were returned to sender and those ineligible due to death, traveling overseas, male gender or too ill to participate, response rates were 41.0% (n=14,792) for women in the young cohort, 53.5% (n=14,200) in the middle-aged cohort and 35.5% (n= 12,614) in the older cohort. A total of 41,616 women agreed to participate in the ALSWH. These women were shown in the baseline survey in 1996 to be broadly representative of the national population of women in this target age

group (Brown et al. 1999). From 1996 to 2011, each age cohort was surveyed once every three years via surveys sent in the mail. In 2011, the older cohort began receiving a shortened questionnaire every six months.

As the majority of people who are affected by arthritis are of working age (Hootman & Helmick 2006), the focus of this PhD study is women from the 1973-1978 cohort (Table 1) and the 1946-1951 cohort (Table 2). Amongst the 1973-78 cohort, 69% responded to Survey 2 in 2000, 66% to Survey 3 in 2003, 68% responded to Survey 4 in 2006, 62% to Survey 5 in 2009, and 62% to Survey 6 in 2012. This retention compares well with other surveys of this highly mobile age group. The major reason for non-response amongst the 1973-78 cohort has been that the research team has been unable to contact the women (between 21% and 28% of the cohort at subsequent surveys), despite using all possible methods of maintaining contact (https://www.alswh.org.au/about/sample).

Retention has been much higher amongst the 1946-51 cohort; 92% responded to Survey 2 in 1998, 85% responded to Survey 3 in 2001, Survey 4 in 2004, Survey 5 in 2007 and 83% responded to Survey 6 in 2010. The major reasons for non-response amongst the 1946-51 cohort included: withdrawal of the individuals from the ALSWH project, an inability of the research team to successfully contact the women, and the non-return of questionnaires by women who could be reached. Moreover, women who could not be contacted were shown to be more likely to be separated, divorced or widowed (https://www.alswh.org.au/about/sample).

Table 1 Age in year and number of participants in 1973-78 cohort over the period 1996-2012

1973-78 cohort			
Survey	**Year**	**Age**	**Participants**
S1	1996	18-23	14,247
S2	2000	22-27	9,688
S3	2003	25-30	9,081
S4	2006	28-33	9,145
S5	2009	31-36	8,200
S6	2012	34-39	8,010

Table 2 Age in year and number of participants in 1946-51 cohort over the period 1996-2013

1946-51 cohort			
Survey	**Year**	**Age**	**Participants**
S1	1996	45-50	13,715
S2	1998	47-52	12,338
S3	2001	50-55	11,226
S4	2004	53-58	10,905
S5	2007	56-61	10,638
S6	2010	59-64	10,011
S7	2013	62-67	9,151

3.1.1.2 Data collection

The questionnaires of all the ALSWH main surveys were sent by mail to the women approximately once every three years. Survey 6 for the 1973-1978 cohort and Survey

7 for the 1946-1951 cohort were selected to examine women's use of TCM as they were the most recent available surveys of these cohorts.

3.1.1.3 Data storage

Participants were responsible for completing the surveys and returning them to ALSWH via a pre-paid return envelope. The questionnaires were then scanned and saved as images. The images were then processed to capture the data using Optical Mark Recognition software. The data capture process from the scanned images was conducted twice using two slightly different levels of mark recognition sensitivity. Any discrepancies between the resulting two data sets and internal inconsistencies in survey responses were then reconciled by ALSWH staff. Additionally, a review of outliers was also conducted to identify any potential errors (http://www.alswh.org.au/).

3.1.1.4 Introduction of questionnaires

The questionnaire items utilised for the analysis of TCM use for women with arthritis included the following items:

Demographic characteristics

Postcode of residence at the time collected of Survey 6 for the 1973-1978 cohort and Survey 7 for the 1946-1951 cohort is used to classify area of residence as "major cities of Australia", "inner regional Australia", "outer regional Australia", "remote Australia", "very remote Australia", based on road distances to service centres according to Australian Standard Geographical Classification (ASGC) (Pink 2010; Russell, Ball & Spallek 2007). The categories of remote and very remote were

combined into one category, as well as categories of inner regional and outer regional due to a low number of participants in this study. As such, this study has three categories of areas of residence: urban, rural and remote.

In addition, women are asked about their current marital status (married/de facto, separated/divorced/widowed, or single), employment situation (paid work and no-paid work), health insurance (yes or no), ethnic background (Australian born, other English speaking background, Asia, or other), the management of available income (impossible/difficult all the time, difficult some of the time, or not too bad) and the highest educational qualification they had completed (no formal education, school certificate, trade/diploma, or university degree/higher degree).

Health status

Women from the young cohort were asked whether they had been diagnosed or treated for any chronic medical conditions in the past 3 years (including diabetes, heart disease, hypertension, low iron, asthma, bronchitis, depression, anxiety disorder, endometriosis, thrombosis, polycystic ovarian syndrome (PCOS), urinary tract infection (UTI), chlamydia, genital herpes, genital warts, hepatitis B or C, and skin cancer). In the middle-aged cohort, women were questioned whether they had been diagnosed or treated for any chronic medical conditions in the past 3 years (including diabetes, arthritis, heart disease, thrombosis, hypertension, stroke, Parkinson's disease, mild cognitive impairment, Alzheimer's disease or dementia, low iron, asthma, bronchitis, cancer, depression, anxiety disorder, chronic fatigue syndrome (CFS), macular degeneration, cataracts, glaucoma, and sexually transmitted infection) (see Appendix 1-2).

The short-form 36 (SF-36) quality of life questionnaire is used to produce a measure of health status and quality of life (Ware, John & Sherbourne 1992). Results of the SF-36 are reported in eight subscales, including physical functioning, role-physical, pain index, general health perceptions, vitality, social functioning, role-emotional, and mental health index (Ware & John 2000). In addition, women from the middle-aged cohort were asked if they diagnosed/treated for OA, RA, and other arthritis in the past 3 years (see Appendix 1). The response categories include Yes and No options.

Use of TCM

The participants were asked how often they had used CHM (no = never or rarely, and yes = sometimes or often) and whether they had consulted an acupuncturist (yes or no), for their own health, over the previous 12 months (see Appendix 1-2).

3.1.1.5 Statistical analyses

This study employed a secondary data analysis design of cross-sectional data. The analysis of the survey data provides an opportunity to estimate the prevalence of TCM use by women with arthritis. Separate prevalence estimates were determined for TCM use, for the cohort overall and stratified by arthritis categories. Descriptive statistics included frequencies and percentages for categorical variables and means and standard deviations for continuous variables. Prevalence estimates for TCM use were calculated with 95% confidence intervals (CIs). The analyses also examined the associations between TCM use and arthritis categories, with adjustment for possible confounders (e.g. demographics, comorbidities). Bivariate analyses, used to test the

association between categorical variables with TCM use, included Pearson's chi-square tests. A one-way analysis of variance (ANOVA) was used to compare continuous variables with TCM use. Multiple logistic regression modelling, including a backward stepwise elimination technique, was used to determine the most important statistically significant factors associated with TCM use. All analyses were conducted using the statistical software program STATA 13.1.

3.1.2 The 45 and Up Study

The 45 and Up Study is a large-scale Australian cohort study of individuals aged 45 years and over, aiming to provide researchers with timely and reliable information on a wide range of exposures and outcomes of public health importance for the ageing population (The 45 and Up Study 2008).

3.1.2.1 Sampling and Data collection

Recruitment of the 45 and Up Study participants occurred in the general population of New South Wales (NSW), Australia. Participants were randomly sampled from the Department of Human Services (formerly Medicare Australia) enrolment database, which included information on all Australian citizens and permanent residents, and some temporary residents and refugees who were residents of NSW. Eligible individuals were mailed an invitation to participate, an information leaflet, the study questionnaire, a consent form, and a prepaid envelope (https://www.saxinstitute.org.au/our-work/45-up-study).

A total of 267,153 participants joined the 45 and Up Study by returning a self-complete baseline questionnaire delivered between 2006 and 2009, and consent

form for long-term follow-up, representing 18% of those invited to participate and 11% of the NSW population aged 45 or older. Rural and remote areas were oversampled. Completed questionnaires were scanned electronically and stored as images and data were double entered. In 2010, the Social, Economic and Environmental Factors (SEEF) study was conducted as a follow-up of a subsample of the 45 and Up Study. The SEEF questionnaire was distributed to the first 100,000 of the 45 and Up Study participants, of whom 60,404 returned the completed questionnaire (response rate: 60.4%). The average follow-up time was 3.4 (SD = 0.95) years. The second wave of data collection was initiated in 2012 with a follow-up questionnaire mailed to over 40,000 participants and a further 86,250 contacted by late 2013. All other remaining participants were re-surveyed in 2014 and 2015. Further details of the responses to the 45 and Up Study baseline questionnaire are presented in Table 3 and are also available in the study preliminary data book, at https://www.saxinstitute.org.au/our-work/45-up-study.

Table 3 Data collected in the 45 and Up Study baseline questionnaire

Demographic and social characteristics	Personal health behaviours	General health-related data
Date of birth	Smoking	Disease and surgical history
Education	Alcohol	Family history of illness
Income	Physical activity	Medication
Marital status	Fruit and vegetable consumption	Functional capacity
Country of birth and ancestry	Other dietary information	Psychological distress
Retirement and work	Sleep habits	Cancer screening history
Social connectedness		Falls
		Oral health
		Skin pigmentation and response to sunlight
		Reproductive history
		Incontinence
		Prostate symptoms and sexual functioning (in men)

3.1.2.2 Sub-study of the 45 and Up Study

In this PhD study, data were obtained from a sub-study of the 45 and Up Study in 2016, 800 women who indicated that they had been diagnosed by a doctor with having OA in the prior 45 and Up Study baseline survey, were mailed a questionnaire and of these women, 403 (50.4%) returned completed sub-study questionnaires. Details of the questionnaire are presented below, and the complete questionnaire in Appendix 3.

Demographic characteristics

Area of residence was assigned according to the Accessibility Remoteness Index of Australia Plus (AIHW 2004) score for each participant's postcode. Participants were asked about their current marital status, the highest educational qualification they had completed, their annual household income, and their level of private healthcare insurance.

Health status

Participants were asked to rate their overall health and overall quality of life on a five-point Likert scale which was involved an SF-36 instrument to measure. They were also asked about their history of smoking, amount of alcohol consumption, and height and weight, to enable a body mass index (BMI) to be calculated. In terms of the categories of smoking status, women who smoked "daily" and "at least weekly" were categorised as current smoker; women who "had ever smoked daily" but "not smoking at all" were categorised as ex-smoker; women who were "not smoking at all" were categorised as non-smoker. According to Australian NHMRC guidelines to reduce health risks from drinking alcohol, consuming up to 2 standard drinks per day (14 drinks per week) is considered to have "low risk" to health while 3 or more standard drinks per day (15 or more drinks per week) being "risky" to health amongst women (NHMRC 2017). As such, women in this study were categorised into non-drinkers, rarely drink, low risk and risky drinkers.

In the 45 and Up Study, participants were provided with a list of diseases (including anxiety/nervous disorder, asthma, cancer, dementia/Alzheimer's disease,

depression, diabetes, heart disease, hypertension, OA, osteoporosis, Parkinson's disease, and stroke) and asked if they had been treated/diagnosed with any of these diseases in the past 12 months. As such, women in this study were selected having been diagnosed with OA and provided information on OA as specified in the invitation letter and questionnaire.

Visits to other health practitioners

Participants were asked whether they consulted with health practitioners for their OA during the past 12 months. Participants were provided with a list of health practitioners (including GP, medical specialist, hospital doctor, nurse, pharmacist/chemist, counsellor, psychologist, dietitian, physiotherapist, and occupational therapist). In addition, participants were asked whether they consulted with any complementary health practitioners during the past 12 months with a list of CAM practitioners (including acupuncturist, chiropractor, naturopath/herbalist, homeopath, massage therapist, meditation instructor, yoga instructor, nutritionist, and osteopath).

Measures of complementary health products or practices

Participants were asked whether they used any complementary health products or practices for their OA during the past 12 months. They were provided with a list of products and practices, including aromatherapy oils, herbal medicines, homeopathic remedies, meditation by yourself (without instructor), yoga by yourself (without instructor), physical activities/exercises, multivitamins, glucosamine/chondroitin, and fish oil.

3.1.2.3 Statistical analyses

In this PhD study, bivariate analyses testing the association between demographic and health status characteristics and acupuncture users status were undertaken using chi-square tests and Fishers Exact tests where appropriate (i.e. when the assumptions of the chi-square test were not met). Logistic regression modelling, which included all demographic and health status characteristics variables that had a bivariate p-value <0.20 (Hosmer & Lemeshow 2005), was conducted using a forward stepwise method, to determine the most parsimonious model for predict use of acupuncture. The model building process utilised the likelihood ratio test to compare competing models, and a p-value <0.05 was adopted for statistical significance. All analyses were conducted using the statistical software program STATA 13.1 (StataCorp LP, College Station, TX, USA).

3.1.3 Practitioner Research and Collaboration Initiative (PRACI)

PRACI is the largest national practice-based research network (PBRN) for complementary healthcare practitioners in the world, which encompasses 14 complementary medicine professions: acupuncturists, aromatherapists, Ayurveda practitioners, Bowen therapists, CHM practitioners, homoeopaths, kinesiologists, massage therapists, musculoskeletal therapists, myotherapists, naturopaths, nutritionists (non-dietetic), reflexologists, Western herbalists, and yoga teachers.

The PRACI network will enable a broad range of research designs including experimental, observational, and qualitative research (Steel, Adams & Sibbritt 2014). As such, research conducted through PRACI will be able to examine important research questions and advance new knowledge about contemporary CAM practice.

PRACI has the potential to provide the CAM professions a legacy of clinically relevant research which is embedded in the realities of practice and which can provide a platform for future critical investigation and rigorous enquiry (Steel, Adams & Sibbritt 2014).

3.1.3.1 Data collection and sampling

Initially, PRACI undertook a workforce survey and recruitment of interested practitioners to the PBRN. Following this, PRACI PBRN members were invited to complete a more detailed survey of their profession and practice.

The complementary medicine (CM) workforce survey was distributed electronically to CM practitioners across fourteen disciplines throughout Australia, including acupuncturists, aromatherapists, Ayurvedic practitioners, Bowen therapists, CHM practitioners, homoeopaths, kinesiologists, massage therapists, myotherapists, naturopaths, nutritionists (non-dietetic), reflexologists, Western herbalists, and yoga practitioners, which contained 19 items covering practitioner demographics and practice characteristics and were designed to capture key information linked to each PRACI member and enable effective administration of future sub-studies through PRACI (Adams et al. 2017).

Data for this PhD research was obtained by surveying, via an online questionnaire, a range of TCM practitioners including acupuncturists, CHM practitioners; to examine their characteristics, perceptions, and experiences relating to the treatments for people with arthritis.

An online questionnaire, administered via *SurveyGizmo*, was structured around three domains: practitioner characteristics, practice characteristics, and clinical management regarding arthritis-related questions. The questionnaire is provided in Appendix 4.

The PRACI database of TCM members was established from all practitioners who completed a CM workforce survey in 2015 and elected to be registered in the network (Steel et al. 2017). A total of 98 TCM practitioners (acupuncturists and CHM practitioners) from the PRACI database were invited to participate in the study via emails sent from PRACI staff.

The TCM survey questionnaire

This TCM-focused questionnaire included questions modified from previous CM workforce survey and others developed specifically by the research team. Content validation of the survey was carried out as a pilot study where involved nine traditional Chinese medicine practitioners. Given the feedback, this survey was submitted to the University of Technology Sydney Human Research Ethics Committee, and the ethics approval was granted. Respondents were asked about practitioner characteristics, practice characteristics, and clinical management regarding arthritis-related questions.

Socio-demographic characteristics

Participants were asked about their socio-demographic characteristics, such as age, gender, and ethnicity. Practitioners were also asked to provide information about their highest qualifications in acupuncture and CHM, and countries where they had

training. Respondents were grouped into professional categories based on their reported qualifications.

Practice characteristics

Practitioners were asked to indicate the location of their clinical practice(s). This included the State or Territory in which they practised, as well as the category of their practice locality (urban, rural, and remote). Practitioners were also asked to provide the frequency with which they refer and receive referrals from a wide range of common health practitioners, including GP, medical specialist, psychologist/counsellor, occupational therapist, physiotherapist, naturopath, chiropractor, and osteopath.

Clinical management regarding arthritis

Respondents were asked about their treatment plan for patients with arthritis. Questionnaire items on treatment plans included patient care hours, patient visits per week and how many treatment consultations per patient, communication styles between TCM practitioners and patients, primary treatments for management of different arthritis symptoms, and personal beliefs for treating arthritis with TCM.

3.1.3.2 Statistical analyses

Raw data were extracted from *SurveyGizmo* to a Microsoft Excel spreadsheet and imported into STATA 13.1 statistical software for analysis. Data were checked for plausibility and cleaned for data errors or outliers. Data were presented in absolute and relative frequencies for dichotomous or categorical variables, as well as means and standard deviations for continuous variables.

An initial descriptive analysis was undertaken for all responses using means and standard deviations or frequencies and percentages, where appropriate. A chi-square test or Fishers Exact test where appropriate was used to examine the association between two categorical variables and Student's t-test was employed for continuous variables. A p-value of <0.05 was set to indicate statistical significance. All analyses were undertaken using statistical software STATA 13.1.

3.2 Ethical approval

The use of the ALSWH dataset was gained from the Human Research Ethics Committee at the University of Technology, Sydney (UTS HREC 2015000249).

The conduct of the 45 and Up Study was approved by the University of New South Wales Human Research Ethics Committee (HREC). Ethics approval for the use of the sub-study dataset from the 45 and Up Study was gained from the Human Research Ethics Committee at the University of Technology, Sydney (UTS HREC 2015000582).

The PRACI study received ethics approval by the University of Technology Sydney Human Research Ethics Committee (UTS HREC REF NO. ETH16-0631).

The copies of the ethics approval letters are attached to this thesis in Appendix 5.

3.3 Chapter summary

Chapter 3 described a broad overview of the methodology used for this thesis by providing the methodology, study design, sample selection, participant recruitment, ethical consideration and statistical analyses that were employed. Further methodological details will be provided in the results chapters.

CHAPTER 4 RESULTS

This chapter presents the results from analyses of data obtained from the ALSWH, the 45 and Up sub-study, and the PRACI survey. Specifically, the prevalence and factors associated with the use of acupuncture and CHM amongst Australian women are presented in Section 4.1. These findings show middle-aged women are more likely to use acupuncture/CHM for their arthritis. As such, in order to find out the detailed prevalence and characteristics of Australian middle-aged women who used TCM, a survey of women aged 45 and older who consulted an acupuncturist for their OA was analysed, and the results are presented in Section 4.2. Since the results from Section 4.1 and 4.2 show a substantial proportion of women with arthritis in Australia use TCM, there is a need to also examine the perceptions and practice behaviours of TCM practitioners regarding arthritis management. In response, Section 4.3 reports on the findings of TCM practitioners' perceptions regarding using TCM to treat people with arthritis.

4.1 Overview of Australian women who use Chinese medicine or acupuncture

4.1.1 Introduction

The results within this section have been published as below:

Yang, L., Sibbritt, D. and Adams, J. (2017). Prevalence and factors associated with the use of acupuncture and Chinese medicine: results of a nationally representative survey of 17,161 Australian women. *Acupuncture in Medicine*, 35(3), pp. 189-199.

This section directly addresses the research question outlined in Section 1.2.2:"What is the prevalence of Australian women's use of TCM for their general health and for

arthritis specifically?" Therefore, following upon a HSR approach, the results from this section provide information on the prevalence of acupuncture and CHM use amongst Australian women. Women who use acupuncture or CHM have been identified as being positively associated with certain health conditions. Specifically, women with arthritis are 1.3 times more likely to use acupuncture compared with women who do not have arthritis.

An examination of the use of TCM and the factors associated with the use of TCM will provide significant insight to inform healthcare providers about TCM use, in order to help them advise their patients regarding efficacy and safety issues.

4.1.2 Prevalence and factors associated with the use of acupuncture and Chinese medicine: results of a nationally representative survey of 17,161 Australian women

Prevalence and factors associated with the use of acupuncture and Chinese medicine: results of a nationally representative survey of 17 161 Australian women

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ABSTRACT

Background Traditional Chinese Medicine has considerable public support in Australia and elsewhere around the world; the literature suggests Chinese medicine (CM) and acupuncture are particularly popular.

Aim To examine factors associated with CM/acupuncture use among young/middle-aged Australian women.

Methods This research formed part of the Australian Longitudinal Study on Women's Health (ALSWH), a population-based cohort study. Data were obtained from the 'young' (34–39 years; n=8010) and 'middle-aged' (62–67 years; n=9151) ALSWH cohorts, who completed survey 6 (in 2012) and survey 7 (in 2013), respectively. Outcome measures included use of CM and visits to an acupuncturist in the previous 12 months. Predictive factors included demographic characteristics, and measures of health status (diagnosed chronic medical conditions) and health service utilisation. Statistical analyses included bivariate χ^2 tests, two proportions Z-tests and backward stepwise multiple logistic regression modelling.

Results In total, 9.5% and 6.2% of women in the young and middle-aged cohorts, respectively, had consulted an acupuncturist, and 5.7% and 4.0%, respectively, had used CM. Young women with low iron levels and/or endometriosis were more likely to use CM and/or acupuncture. Middle-aged women with low iron levels and/or chronic fatigue syndrome (CFS) were more likely to use CM, while middle-aged women with arthritis and/or CFS were more likely to use acupuncture.

Conclusions Women with chronic conditions (including arthritis, low iron, CFS and endometriosis) were associated with higher odds of CM/acupuncture use. There is a need for further research to examine the potential benefits of CM/acupuncture for these chronic illnesses.

INTRODUCTION

In Australia and elsewhere, Traditional Chinese Medicine (TCM) has emerged as an integral part of the growing field of complementary and alternative medicine.[1] TCM use has also emerged as a topic of research interest during recent years.[2–4] Since the late 20th century, the demand for TCM has grown steadily in high-income countries.[3 5 6] Acupuncture became a registered profession in 2000 in the state of Victoria, Australia, and the national registration of acupuncturists became mandatory in 2012. By 2014, over 4000 practitioners had registered with the Chinese Medicine Board of Australia (CMBA).

TCM use is prevalent worldwide. In a US survey reporting on 3158 Chinese adults aged ≥60 years, 76% of participants reported having used TCM within the past year.[4] Similarly, a study of 186 British Chinese participants in the UK identified that the majority of respondents (78%) used TCM.[6] Another study from Taiwan concluded the prevalence of TCM use for women and men was 31.8% and 22.4% respectively, among 14 064 participants.[7] TCM encompasses many different practices including acupuncture, Chinese medicine (CM), moxibustion, *Tuina* (Chinese therapeutic massage), dietary therapy, *Tai chi* and *Qi gong*. Among these different practices, CM and acupuncture are the most

commonly used in the USA.[3] CM is described in the Chinese Materia Medica (a pharmacological reference book used by TCM practitioners), which draws upon thousands of medicinal substances—primarily plants, but also some minerals and animal products.[8] In Australia, herbs are often combined in formulas and prescribed by TCM practitioners as teas, capsules, liquid extracts, granules or powders.[3] A number of studies have shown varying degrees of benefit of CM for osteoarthritis and rheumatoid arthritis.[9 10]

Acupuncture involves penetration of the skin with thin, solid, metal needles that are subsequently manipulated by hand (manual acupuncture) or by electrical stimulation (electroacupuncture).[3] Systematic reviews have increasingly showed acupuncture to be effective for pain relief in low back pain,[11] osteoarthritis[12] and headache.[13] In the USA, 6.8% of 22 512 adults reported lifetime use of acupuncture.[14] Acupuncture is also widely used around the world with 9.2% of Australian adults reporting acupuncture use over a 12-month period; it is estimated that there are 10.2 million visits to acupuncturists in Australia annually.[15]

Few studies have explored the characteristics of female users of CM or acupuncture. However, women are reported to be high users of CM and acupuncture.[7 16 17] According to a population-based, cross-sectional study from Taiwan with 14 064 participants, female gender, younger age and a self-reported healthy lifestyle were all positively associated with CM use.[7] In the Australian Longitudinal Study on Women's Health (ALSWH) 2001 survey, Australian middle-aged women who consulted acupuncturists were more likely to be single (neither married nor in a de facto relationship), to have had a major personal illness in the previous year, to have suffered from a variety of symptoms or to have significantly lower scores on all eight dimensions of the 36-Item Short-Form (SF-36) health-related quality of life scale (ie, to be in poorer health).[16] A recent US survey of 31 044 adults reported a positive association between acupuncture use and being an Asian female or an ex-smoker, or having poorer self-reported health status or a higher level of education.[17] To date little research has provided a detailed examination of the prevalence and factors associated with acupuncture and CM use among women in Australia. Therefore, the aim of this study was to examine the prevalence and characteristics of CM and acupuncture users in two nationally representative samples of women: 'young' women aged 34–49 years (n=8010); and 'middle-aged' women aged 62–67 years (n=9151).

METHODS

Data source and analytical sample

This cross-sectional study was conducted as part of the ALSWH, which was designed to investigate multiple factors affecting the health and well-being of women over a 20-year period. Women included in the study were recruited via random selection from the national Medicare database into 'young' (born between 1973 and 1978) and 'middle-aged' (born between 1946 and 1951) cohorts.[18] The baseline surveys, consisting of 14 779 and 14 099 women in the young and middle-aged cohorts, respectively, were both conducted in 1996, and the respondents have been shown to be broadly representative of the national population of women in the target age groups.[19] However, only the most recent surveys (six and seven for young and middle-aged women, respectively) in 2012/2013 were used in the analysis, with 8010 and 9151 participants, respectively. Ethical approval for the use of the ALSWH dataset was gained from the Human Research Ethics Committees at the University of Technology, Sydney. The study participants provided written consent.

Measures of demographic characteristics

Postcode of residence at the time of the survey was used to categorise residence as urban or non-urban. Women were asked about their current marital status (married/de facto, separated/divorced/widowed, or never married), health insurance coverage, smoking status, alcohol use and their ability to manage on available income (impossible/difficult, not too bad, or easy).

Measure of health status

Women were asked whether they had been diagnosed or treated for any chronic medical conditions on a pre-specified list in the last 3 years. The number of chronic medical conditions varied for each cohort. For the young cohort, participants were questioned with regards to 17 medical conditions (diabetes, heart disease, hypertension, low iron, asthma, bronchitis, depression, anxiety disorder, endometriosis, thrombosis, polycystic ovarian syndrome (PCOS), urinary tract infection (UTI), chlamydia, genital herpes, genital warts, hepatitis B or C, skin cancer). In the middle-aged cohort participants were questioned with regards to 20 chronic medical conditions (diabetes, arthritis, heart disease, thrombosis, hypertension, stroke, Parkinson's disease, mild cognitive impairment, Alzheimer's disease or dementia, low iron, asthma, bronchitis, cancer, depression, anxiety disorder, chronic fatigue syndrome (CFS), macular degeneration, cataracts, glaucoma, sexually transmitted infection).

Measure of health service use

The women were asked about their frequency of use (for their own health) of a range of different healthcare practitioners over the previous 12 months, including a general practitioner (GP; 0, 1–2, 3–4, 5–6, ≥7 visits), a hospital doctor (0, 1–2, 3–4, 5–6, ≥7

visits), a specialist doctor (0, 1–2, 3–4, 5–6, ≥7 visits) and a dentist (yes or no).

Outcome measures

Women were asked how often they had used (herbal) CM (never/rarely=no, sometimes/often=yes) and whether they had consulted an acupuncturist (yes or no), for their own health, over the previous 12 months.

Statistical analyses

Differences in the proportions of CM and acupuncture use were compared between the young and middle-aged cohorts using a two proportions Z-test. Pairwise tests of association between participants' demographic, diagnostic and health services utilisation characteristics and their CM or acupuncture user status (ie, bivariate comparisons) were performed using the χ^2 test. For each cohort a separate multiple logistic regression model was produced to determine the statistically significant factors associated with CM or acupuncture use on an 'often' basis. All the demographic, diagnostic and health service utilisation variables listed above with a p value <0.25 in the bivariate comparisons were entered into a model and then a stepwise backward elimination process was employed, using a likelihood ratio test, to eventually produce the most parsimonious model.[20] In response to the large sample size, a p value threshold <0.005 was adopted for statistical significance.[21] All analyses were conducted using the statistical programme Stata (StataCorp LP, College Station, Texas, USA).

RESULTS

Australian women appeared to use more acupuncture than CM as a component of their healthcare. In total, 9.5% (95% CI 8.8% to 10.2%) of women (n=761) in the young cohort consulted an acupuncturist and 6.2% (95% CI 5.7% to 6.8%) of women (n=564) in the middle-aged cohort had consulted an acupuncturist for their own health in the past 12 months. Meanwhile, CM was used by 5.7% (95% CI 5.2% to 6.2%) of women (n=456) in the young cohort and 4.0% (95% CI 3.6% to 4.4%) of women (n=366) in the middle-aged cohort. The differences in the proportions of women using CM and acupuncture differed significantly between the young and middle-aged cohorts (both p<0.01).

Comparisons between CM and acupuncture users and non-users with regards to demographic characteristics within the young and middle-aged cohorts are shown in table 1. In the young cohort, both CM and acupuncture users were significantly more likely to reside in urban areas as well as have private health insurance. In the middle-aged cohort, women who used CM or acupuncture were significantly more likely to be ex-smokers. In both the young and middle-aged cohorts, women who used CM were significantly more likely to report higher levels of exercise. Furthermore, middle-aged women residing in urban areas were more likely to use acupuncture than those who resided in non-urban areas.

Table 2 details the association between CM or acupuncture use by diagnostic status. In the young cohort, a greater proportion of CM users had been diagnosed with low iron levels, endometriosis, anxiety disorder, CFS and/or PCOS when compared to non-CM users. Women in the middle-aged cohort who consulted an acupuncturist were more likely to have low iron levels, anxiety disorder, depression, CFS and/or arthritis when compared to women who had not consulted an acupuncturist over the previous 12 months.

The associations between women's use of health services and their use of CM or acupuncture are presented in table 3. Compared with non-users, young CM and acupuncture users were more frequent visitors to GPs, specialist doctors and dentists. In the middle-aged cohort, women who consulted an acupuncturist were also more likely to have consulted a GP, a specialist doctor and/or a dentist.

The statistically significant predictors of CM or acupuncture use for women in the young cohort are presented in table 4. Women who were married or in a de facto relationship were less likely to use CM (OR 0.67, 95% CI 0.51 to 0.87) compared to women who were single. Women with private health insurance were 1.65 (95% CI 1.29 to 2.10) times more likely to use CM compared to women without private health insurance. Compared with sedentary women, those with high levels of exercise activity (OR 1.86, 95% CI 1.32 to 2.61) demonstrated higher odds of CM use. Compared with non-smokers, ex-smokers (OR 1.49, 95% CI 1.20 to 1.85) also had higher odds of CM use. Compared to women who did not consult a specialist during the preceding 12 months, those reporting three to four (OR 1.49, 95% CI 1.06 to 2.11), five to six (OR 3.04, 95% CI 2.14 to 4.31) or seven or more (OR 1.93, 95% CI 1.40 to 2.66) specialist visits over the previous 12 months showed higher odds of CM use. Similarly, compared to women who did not consult a specialist during the preceding 12 months, women were more likely to have used acupuncture if they had one to two (OR 1.54, 95% CI 1.27 to 1.86), three to four (OR 1.68, 95% CI 1.29 to 2.20), five to six (OR 2.60, 95% CI 1.94 to 3.49) or seven or more (OR 2.80, 95% CI 2.22 to 3.54) specialist visits over the previous 12 months were more likely to have used acupuncture. A diagnosis of low iron levels and/or endometriosis was associated with higher odds of CM and acupuncture use compared to diagnosis with other chronic illnesses.

Table 5 shows the statistically significant predictors of CM or acupuncture use for women in the middle-aged cohort. Compared with sedentary women, women with low (OR 1.84, 95% CI 1.23 to 2.75), moderate (OR 1.89, 95% CI 1.25 to 2.84) and

Table 1 Association between demographic characteristics and use of CM and acupuncture

	Young cohort (34–39 years)								Middle-aged cohort (62–67 years)							
	CM				Acupuncture				CM				Acupuncture			
Characteristics	Yes (n=456)	No (n=7542)	χ^2	p Value	Yes (n=761)	No (n=7221)	χ^2	p Value	Yes (n=366)	No (n=8743)	χ^2	p Value	Yes (n=564)	No (n=8522)	χ^2	p Value
Area of residence																
Urban	298 (69.8%)	4254 (59.4%)	18.187	<0.001	480 (66.5%)	4062 (59.3%)	14.171	<0.001	158 (43.9%)	3342 (38.9%)	3.57	0.059	263 (47.5%)	3226 (38.6%)	17.33	<0.001
Non-urban	129 (30.2%)	2910 (40.6%)			242 (33.5%)	2792 (40.7%)			202 (56.1%)	5243 (61.1%)			291 (52.5%)	5140 (61.4%)		
Marital status																
Married/de facto	331 (74.1%)	5885 (79%)	8.585	0.014	575 (76.8%)	5625 (78.9%)	1.951	0.377	249 (69%)	6504 (75.1%)	9.09	0.011	398 (71.3%)	6340 (75.1%)	5.417	0.067
Separated/divorced/widowed	33 (7.4%)	549 (7.4%)			78 (7.7%)	525 (7.4%)			96 (26.6%)	1936 (22.4%)			139 (24.9%)	1886 (22.3%)		
Never married	83 (18.6%)	1018 (13.7%)			116 (15.5%)	982 (13.8%)			16 (4.4%)	227 (2.6%)			21 (3.8%)	216 (2.6%)		
Insurance																
Yes	338 (74.3%)	4931 (65.6%)	14.505	<0.001	599 (79.2%)	4660 (64.7%)	64.362	<0.001	131 (35.9%)	3309 (38%)	0.638	0.424	398 (70.7%)	5227 (61.52%)	18.86	<0.001
No	117 (25.7%)	2588 (34.4%)			157 (20.8%)	2541 (35.3%)			234 (64.1%)	5408 (62%)			165 (29.3%)	3269 (38.48%)		
Income management																
Difficult	50 (11.2%)	990 (13.3%)	1.621	0.445	102 (13.6%)	936 (13.1%)	0.212	0.899	46 (12.7%)	866 (10%)	11.35	0.003	63 (11.3%)	848 (10.1%)	5.508	0.064
OK	139 (31.2%)	2299 (30.9%)			227 (30.2%)	2203 (30.9%)			100 (27.6%)	1876 (21.8%)			141 (25.3%)	1826 (21.7%)		
Easy	257 (57.6%)	4163 (55.9%)			422 (56.2%)	3990 (56%)			217 (59.8%)	5888 (68.2%)			354 (63.4%)	5735 (68.2%)		
Exercise group																
Inactive	49 (11.4%)	1073 (15%)	13.528	0.004	100 (13.9%)	1018 (14.9%)	8.732	0.033	36 (10.1%)	1486 (17.7%)	16.62	0.001	101 (18.5%)	1418 (17.3%)	5.68	0.128
Low	153 (35.7%)	2715 (38.1%)			262 (36.3%)	2601 (38.1%)			85 (23.9%)	2035 (24.2%)			139 (25.5%)	1976 (24.1%)		
Moderate	85 (19.8%)	1522 (21.3%)			139 (19.3%)	1463 (21.4%)			76 (21.4%)	1775 (21.1%)			93 (17%)	1747 (21.3%)		
High	142 (33.1%)	1822 (25.6%)			220 (30.5%)	1741 (25.5%)			159 (44.7%)	3112 (37%)			213 (39%)	3055 (37.3%)		
Smoking																
Non-smoker	255 (56.7%)	4596 (61.4%)	9.916	0.007	450 (59.7%)	4391 (61.3%)	3.651	0.161	225 (61.5%)	5439 (62.3%)	10.98	0.004	364 (64.5%)	5281 (62%)	14.53	0.001
Ex-smoker	151 (33.6%)	2013 (26.9%)			226 (30%)	1935 (27%)			217 (34.7%)	2593 (29.7%)			179 (31.7%)	2537 (29.8%)		
Current smoker	44 (9.8%)	881 (11.8%)			78 (10.3%)	842 (11.8%)			14 (3.8%)	704 (8.1%)			21 (3.7%)	697 (8.2%)		
Alcohol																
Non-drinker	273 (60.8%)	4337 (58%)	3.049	0.384	475 (63%)	4128 (57.7%)	8.568	0.036	194 (53.7%)	4685 (54.3%)	1.877	0.598	316 (56.9%)	4547 (54.1%)	3.677	0.299
Rarely drink	55 (12.3%)	871 (11.7%)			84 (11.1%)	836 (11.7%)			52 (14.4%)	1430 (16.6%)			76 (13.7%)	1406 (16.7%)		
Low risk	99 (22.1%)	1925 (25.8%)			165 (21.9%)	1857 (26%)			92 (25.5%)	2013 (23.3%)			130 (23.4%)	1963 (23.3%)		
Risky	22 (4.9%)	344 (4.6%)			30 (4.0%)	333 (4.7%)			23 (6.40%)	502 (5.8%)			33 (6.0%)	495 (5.9%)		

Data are presented as n (%).
CM, Chinese medicine.

Table 2 Association between health status (diagnosed) and use of CM and acupuncture

	Young cohort (34–39 years)								Middle-aged cohort (62–67 years)							
	CM				Acupuncture				CM				Acupuncture			
Characteristics	Yes (n=456)	No (n=7542)	χ^2	p Value	Yes (n=761)	No (n=7221)	χ^2	p Value	Yes (n=366)	No (n=8743)	χ^2	p Value	Yes (n=564)	No (n=8522)	χ^2	p Value
Hypertension																
Yes	12 (2.6%)	322 (4.4%)	3.072	0.08	26 (3.5%)	308 (4.4%)	1.293	0.255	116 (31.8%)	3035 (34.9%)	1.455	0.028	195 (34.6%)	34.7 34.7	0.001	0.981
No	442 (97.4%)	7074 (95.7%)			724 (96.5%)	6774 (95.7%)			249 (68.2%)	5674 (65.2%)			368 (65.4%)	65.3 65.3		
Low iron																
Yes	122 (26.9%)	1127 (15.2%)	43.274	<0.001	169 (22.5%)	1079 (15.2%)	26.961	<0.001	46 (12.6%)	694 (8%)	10.15	0.001	64 (11.4%)	7.9 7.9	8.732	0.003
No	332 (73.1%)	6269 (84.8%)			581 (77.5%)	6003 (84.8%)			318 (87.4%)	8012 (92%)			496 (88.6%)	92.1 92.1		
Asthma																
Yes	45 (9.9%)	742 (10%)	0.007	0.934	80 (10.7%)	703 (9.9%)	0.413	0.521	46 (12.6%)	1071 (12.3%)	0.036	0.849	75 (13.4%)	12.3 12.3	0.604	0.437
No	409 (90.1%)	6654 (90%)			670 (89.3%)	6379 (90.1%)			318 (87.4%)	7635 (87.7%)			485 (86.6%)	87.7 87.7		
Bronchitis																
Yes	33 (7.3%)	405 (5.5%)	2.61	0.106	47 (6.3%)	390 (5.5%)	0.743	0.389	42 (11.5%)	689 (7.9%)	6.194	0.013	59 (10.5%)	7.9 7.9	4.897	0.027
No	421 (92.7%)	6991 (94.5%)			703 (93.7%)	6692 (94.5%)			322 (88.5%)	8017 (92.1%)			501 (89.5%)	92.1 92.1		
Depression																
Yes	81 (17.8%)	1257 (17%)	0.216	0.642	145 (19.3%)	1192 (16.8%)	2.999	0.083	54 (14.8%)	1050 (12.1%)	2.444	0.118	94 (16.8%)	11.9 11.9	11.83	0.001
No	373 (82.2%)	6139 (83%)			605 (80.7%)	5890 (83.2%)			311 (85.2%)	7654 (87.9%)			466 (83.2%)	88.1 88.1		
Anxiety disorder																
Yes	73 (16.1%)	816 (11%)	10.847	0.001	106 (14.1%)	783 (11.1%)	6.382	0.012	55 (15.1%)	868 (10%)	9.952	0.002	78 (13.9%)	9.9 9.9	9.357	0.002
No	381 (83.9%)	6580 (89%)			644 (85.9%)	6299 (88.9%)			310 (84.9%)	7836 (90%)			482 (86.1%)	90.1 90.1		
Endometriosis*																
Yes	34 (7.5%)	258 (3.5%)	19.116	<0.001	52 (6.9%)	239 (3.4%)	24.006	<0.001	–	–		–	–	–		–
No	420 (92.5%)	7138 (96.5%)			698 (93.1%)	6843 (96.6%)			–	–		–	–	–		–
PCOS*																
Yes	34 (7.5%)	311 (4.2%)	10.979	0.001	45 (6%)	301 (4.3%)	4.917	0.027	–	–		–	–	–		–
No	420 (92.5%)	7085 (95.8%)			705 (94%)	6781 (95.8%)			–	–		–	–	–		–

Continued

Table 2 Continued

Characteristics	Young cohort (34–39 years)								Middle-aged cohort (62–67 years)							
	CM				Acupuncture				CM				Acupuncture			
	Yes (n=456)	No (n=7542)	χ^2	p Value	Yes (n=761)	No (n=7221)	χ^2	p Value	Yes (n=366)	No (n=8743)	χ^2	p Value	Yes (n=564)	No (n=8522)	χ^2	p Value
UTI*																
Yes	74 (16.3%)	915 (12.4%)	5.994	0.014	117 (15.6%)	871 (12.3%)	6.705	0.01	–	–		–	–	–		–
No	380 (83.7%)	6481 (87.6%)			633 (84.4%)	6211 (87.7%)			–	–		–	–	–		–
Diabetes†																
Yes	–	–		–	–	–		–	19 (5.2%)	792 (9.2%)	6.636	0.01	49 (8.8%)	755 (9%)	0.029	0.864
No	–	–		–	–	–		–	345 (94.8%)	7849 (90.8%)			511 (91.3%)	7668 (91%)		
IGT†																
Yes	–	–		–	–	–		–	16 (4.4%)	259 (3%)	2.307	0.129	25 (4.5%)	248 (2.9%)	4.117	0.042
No	–	–		–	–	–		–	348 (95.6%)	8382 (97%)			535 (95.5%)	8175 (97.1%)		
Arthritis†																
Yes	–	–		–	–	–		–	135 (37.1%)	3355 (38.6%)	0.349	0.555	260 (46.4%)	3222 (38.1%)	15.27	<0.001
No	–	–		–	–	–		–	229 (62.9%)	5331 (61.4%)			301 (53.7%)	5245 (62%)		
Osteoporosis†																
Yes	–	–		–	–	–		–	35 (9.6%)	803 (9.2%)	0.057	0.811	59 (10.5%)	779 (9.2%)	1.083	0.298
No	–	–		–	–	–		–	329 (90.4%)	7883 (90.8%)			502 (89.5%)	7688 (90.8%)		
Heart disease†																
Yes	–	–		–	–	–		–	25 (6.9%)	499 (5.7%)	0.807	0.369	28 (5%)	490 (5.8%)	0.626	0.429
No	–	–		–	–	–		–	340 (93.2%)	8210 (94.3%)			535 (95%)	7998 (94.2%)		
Breast cancer†																
Yes	–	–		–	–	–		–	12 (3.3%)	226 (2.6%)	0.666	0.414	16 (2.9%)	223 (2.6%)	0.107	0.743
No	–	–		–	–	–		–	351 (96.7%)	8448 (97.4%)			542 (97.1%)	8232 (97.4%)		
Other cancer†																
Yes	–	–		–	–	–		–	13 (3.6%)	227 (2.6%)	1.253	0.263	15 (2.7%)	224 (2.7%)	0.003	0.956
No	–	–		–	–	–		–	350 (96.4%)	8447 (97.4%)			543 (97.3%)	8231 (97.4%)		
CFS†																
Yes	–	–		–	–	–		–	15 (4.1%)	84 (1%)	32.08	<0.001	17 (3%)	80 (0.9%)	21.69	<0.001
No	–	–		–	–	–		–	350 (95.9%)	8620 (99%)			543 (97%)	8406 (99.1%)		

Data are presented as n (%).
*Information not collected in the survey of middle-age women.
†Information not collected in the survey of young women.
CFS, chronic fatigue syndrome; CM, Chinese medicine; IGT, impaired glucose tolerance; PCOS, polycystic ovarian syndrome; UTI, urinary tract infection.

Table 3 Prevalence of CM and acupuncture use and association with consultations by provider type

	Young cohort (34–39 years)							Middle-aged cohort (62–67 years)						
	CM				Acupuncture			CM				Acupuncture		
Characteristics	Yes (n=456)	No (n=7542)	χ^2	p Value	Yes (n=761)	No (n=7221)	χ^2	p Value	Yes (n=366)	No (n=8743)	χ^2	p Value	Yes (n=564)	No (n=8522)	χ^2	p Value
GP/family doctor																
0	28 (6.2%)	398 (5.3%)	16.309	0.003	26 (3.4%)	399 (5.5%)	61.305	<0.001	17 (4.6%)	336 (3.9%)	3.183	0.528	13 (2.3%)	339 (4%)	56.729	<0.001
1–2	124 (27.3%)	2698 (35.8%)			193 (25.5%)	2622 (36.3%)			97 (26.5%)	2646 (30.3%)			107 (19%)	2634 (30.9%)		
3–4	143 (31.4%)	2253 (29.9%)			240 (31.7%)	2149 (29.8%)			121 (33.1%)	2788 (31.9%)			182 (32.3%)	2720 (31.9%)		
5–6	78 (17.1%)	1147 (15.2%)			143 (18.9%)	1079 (15%)			68 (18.6%)	1625 (18.6%)			140 (24.8%)	1544 (18.1%)		
7+	82 (18%)	1040 (13.8%)			156 (20.6%)	968 (13.4%)			63 (17.2%)	1341 (15.4%)			122 (21.6%)	1278 (15%)		
Specialist doctor																
0	176 (39%)	3881 (51.6%)	68.119	<0.001	261 (34.5%)	3786 (52.6%)	139.61	<0.001	150 (41.1%)	3992 (45.7%)	5.994	0.2	198 (35.1%)	3943 (46.3%)	41.148	<0.001
1–2	110 (24.4%)	1967 (26.2%)			216 (28.5%)	1855 (25.8%)			130 (35.6%)	3120 (35.7%)			210 (37.2%)	3025 (35.6%)		
3–4	50 (11.1%)	675 (9%)			81 (10.7%)	643 (8.9%)			56 (15.3%)	1038 (11.9%)			102 (18.1%)	990 (11.6%)		
5–6	52 (11.5%)	358 (4.8%)			69 (9.1%)	342 (4.8%)			17 (4.7%)	342 (3.9%)			33 (5.9%)	322 (3.8%)		
7+	63 (14%)	640 (8.5%)			130 (17.2%)	573 (8%)			12 (3.3%)	239 (2.7%)			21 (3.7%)	229 (2.7%)		
Dentist																
Yes	311 (68.4%)	4600 (61.1%)	9.642	0.002	537 (70.8%)	4363 (60.5%)		<0.001	270 (73.8%)	5861 (67.2%)	7.006	0.008	435 (77.3%)	5676 (66.6%)	27.109	<0.001
No	144 (31.7%)	2934 (38.9%)			222 (29.3%)	2851 (39.5%)			96 (26.2%)	2867 (32.9%)			128 (22.7%)	2842 (33.4%)		
Hospital doctor*																
0	–	–	–	–	–	–	–	–	269 (73.9%)	6850 (78.6%)	5.487	0.241	404 (71.8%)	6696 (78.8%)	15.722	0.003
1–2	–	–	–	–	–	–	–	–	68 (18.7%)	1413 (16.2%)			118 (21%)	1361 (16%)		
3–4	–	–	–	–	–	–	–	–	17 (4.7%)	278 (3.2%)			25 (4.4%)	268 (3.2%)		
5–6	–	–	–	–	–	–	–	–	6 (1.7%)	106 (1.2%)			9 (1.6%)	102 (1.2%)		
7+	–	–	–	–	–	–	–	–	4 (1.1%)	72 (0.8%)			7 (1.2%)	70 (0.8%)		

Data are presented as n (%).
*Information not collected in the survey of young women.
CM, Chinese medicine; GP, general practitioner.

Table 4 Association between characteristics and use of CM and acupuncture for women in the young cohort

	Adjusted OR	95% CI	p Value
Predictors of CM use			
Marital status			
Never married/single	1.00	–	
Married/de facto	0.67	0.51 to 0.87	0.003
Separated/divorced/widow	0.78	0.50 to 1.23	0.286
Insurance			
No	1.00	–	
Yes	1.65	1.29 to 2.10	<0.001
Exercise group			
Nil/sedentary	1.00	–	
Low	1.28	0.91 to 1.79	0.156
Moderate	1.30	0.90 to 1.89	0.160
High	1.86	1.32 to 2.61	<0.001
Smoking status			
Non-smoker	1.00	–	
Ex-smoker	1.49	1.20 to 1.85	<0.001
Current smoker	1.08	0.76 to 1.55	0.656
Number of specialist visits			
Never	1.00	–	
1–2 times	1.12	0.87 to 1.45	0.382
3–4 times	1.49	1.06 to 2.11	0.022
5–6 times	3.04	2.14 to 4.31	<0.001
7+	1.93	1.40 to 2.66	<0.001
Low iron level			
No	1.00	–	
Yes	1.87	1.48 to 2.36	<0.001
Endometriosis			
No	1.00	–	
Yes	1.80	1.22 to 2.68	0.003
Predictors of acupuncture consultation			
Insurance			
No	1.00	–	
Yes	1.61	1.34 to 1.94	<0.001
Number of specialist visits			
Never	1.00	–	
1–2 times	1.54	1.27 to 1.86	<0.001
3–4 times	1.68	1.29 to 2.20	<0.001
5–6 times	2.60	1.94 to 3.49	<0.001
7+	2.80	2.22 to 3.54	<0.001
Low iron level			
No	1.00	–	
Yes	1.50	1.24 to 1.81	<0.001
Endometriosis			
No	1.00	–	
Yes	1.64	1.20 to 2.26	0.002

CM, Chinese medicine.

high (OR 2.31, 95% CI 1.59 to 3.36) levels of exercise activity had higher odds of CM use. Compared to those that did not visit a specialist over the preceding 12 months, women with one to two (OR 1.31, 95% CI 1.06 to 1.60), three to four (OR 1.77, 95% CI 1.36 to 2.29), five to six (OR 1.77, 95% CI 1.19 to 2.63), and seven or more (OR 1.63, 95% CI 1.01 to 2.63) specialist visits over the previous 12 months demonstrated higher odds of acupuncture use. Women who had visited a dentist over the previous 12 months were 1.61 (95% CI 1.31 to 1.99) times more likely to use acupuncture compared to women who had not. Being diagnosed as having a low iron level (OR 1.74, 95% CI 1.26 to 2.41) and/or CFS (OR 4.83, 95% CI 2.73 to 8.56) was associated with higher odds of CM use, while women with a diagnosis of arthritis (OR 1.30, 95% CI 1.09 to 1.55) and CFS (OR 3.33, 95% CI 1.93 to 5.74) had higher odds of acupuncture use compared to women who did not have these chronic illnesses.

Table 5 Association between characteristics and use of CM and acupuncture for women in the middle-aged cohort

	Adjusted OR	95% CI	p Value
Predictors of CM use			
Exercise group			
Nil/sedentary	1.00	–	
Low	1.84	1.23 to 2.75	0.003
Moderate	1.89	1.25 to 2.84	0.002
High	2.31	1.59 to 3.36	<0.001
Low iron level			
No	1.00	–	
Yes	1.74	1.26 to 2.41	0.001
CFS			
No	1.00	–	
Yes	4.83	2.73 to 8.56	<0.001
Predictors of acupuncture consultation			
Area of residence			
Urban	1.00	–	
Non-urban	0.75	0.63 to 0.90	0.002
Smoking status			
Non-smoker	1.00	–	
Ex-smoker	1.03	0.86 to 1.25	0.970
Current smoker	0.42	0.26 to 0.69	0.001
Specialist			
Never	1.00	–	
1–2 times	1.31	1.06 to 1.60	0.011
3–4 times	1.77	1.36 to 2.29	<0.001
5–6 times	1.77	1.19 to 2.63	0.005
7+	1.63	1.01 to 2.63	0.044
Dentist			
No	1.00	–	
Yes	1.61	1.31 to 1.99	<0.001
CFS			
No	1.00	–	
Yes	3.33	1.93 to 5.74	<0.001
Arthritis			
No	1.00	–	
Yes	1.30	1.09 to 1.55	0.004

CFS, chronic fatigue syndrome; CM, Chinese medicine.

DISCUSSION

This study reports the prevalence of CM and acupuncture use among Australian women aged 34–39 and 62–67 years. While many studies on general CM or acupuncture use have been undertaken,[16 22 23] this is the first to focus specifically upon women. It has been reported that >7%/9.2% of Australian adults have used CM/acupuncture,[1] which is in accordance with our findings—6%/10% of young and 4%/10% of middle-aged women, respectively. Our study suggests that the use of CM is less common than the use of acupuncture among women in Australia, and thereby differs from studies in other countries such as Singapore,[24] Taiwan[25] and Canada.[26] This disparity may be due to the inclusion of a lower percentage of Asian participants in our study compared to others. The prevalence of CM/acupuncture use was significantly higher in the younger cohort examined in our study, which is consistent with previous large population cross-sectional research conducted in Taiwan that suggested this may be due to the fact that younger adults report more knowledge of TCM.[2] However, we also found that the predictors of CM/acupuncture use differed between the young and middle-aged cohorts, which may reflect degenerating musculoskeletal health due to ageing.[27] There were notable differences in the prevalence of life stage-related symptoms and conditions, with women in the middle-aged cohort experiencing more physical illnesses than those in the young cohort.[27] Furthermore, our logistic regression modelling showed that the predictors of CM/acupuncture use were different. Specifically, women using acupuncture were more likely to have arthritis, suggesting acupuncture use may have been driven by the need to address arthritic pain.[12] While these findings are interesting, further research is needed to explore the details and reasons for the differences in CM/acupuncture use among those with particular health symptoms and conditions.

It was interesting to note that, in both cohorts, those who had consulted an acupuncturist tended to report more specialist health professional visits than those who had not. This finding is in agreement with previous studies in Germany and Australia that found patients accessing acupuncture had a significantly higher rate of consultation with specialists±GPs compared with those not receiving acupuncture.[22 28] The association between increased use of healthcare (such as specialist consultations) and acupuncture may be partly explained by disease-related factors. For example, people with chronic illnesses may seek out multiple healthcare providers,[29] and receiving acupuncture seems to be a surrogate parameter for high health service use.[28] We also found that a visit to a dentist is another predictor of acupuncture use in middle-aged women. There was no correlation between the number of doctors' visits and CM/acupuncture use, which is probably due to the fact that almost all women in both cohorts consulted a doctor at some point. Beyond these findings there is a need to undertake further research to identify the reasons why people with chronic illnesses choose to use CM/acupuncture among a multitude of healthcare options. Such investigation could provide important insights for healthcare providers and policymakers.

This study showed that CM/acupuncture use was positively associated with some health conditions. Specifically, women using CM/acupuncture were more likely to have low iron levels and/or endometriosis (young cohort), and low iron levels, CFS and/or arthritis (middle-aged cohort). Similar findings have been identified from previous research, which has revealed that CM/acupuncture use is substantial among women with endometriosis, CFS and arthritis.[17 22 30] Moreover, several studies have shown beneficial effects of CM/acupuncture in chronic conditions including rheumatoid arthritis, anaemia, osteoarthritis, diabetes and CFS.[10 31–33] While nearly one third of Australian young women have been diagnosed with a low iron level,[34] limited research has focused on its correlation with CM/acupuncture use. A previous Australian study found that middle-aged women with low iron levels were more likely to use yoga or meditation;[27] however, more research is necessary to further examine the relationship with acupuncture/CM use. Several types of CM have been recommended for the treatment of anaemia, which is related to low iron levels;[35] however, the effectiveness of CM/acupuncture for many chronic illnesses has not yet been rigorously evaluated and further evidence is needed to help women with chronic illnesses make decisions regarding these treatments.

Women from the young and middle-aged cohorts in our study who used CM had significantly higher exercise levels than women who did not. This finding appears to fit comfortably alongside the results of other work suggesting that women who exercise regularly are more likely to be CM users.[23] We also found that non-smokers and/or ex-smokers were more likely to use CM and/or acupuncture, which is supported by previous studies showing that women who are more 'health conscious' are more likely to use complementary and alternative medicine,[36] and that acupuncture is sometimes used as a preventive modality to promote general health.[37] Smoking cessation, in particular, is a healthy lifestyle choice; it is known from previous work that CM/acupuncture use is associated with such choices.[38] Unfortunately, there remains a lack of large-scale population-based studies examining associations between women's use of CM/acupuncture and health behaviours, and further research is needed on this topic.

One limitation of our study is that our analyses drew upon a definition of TCM that was limited to only CM/acupuncture use, which may have led to a conservative estimation of TCM use among participants. A number of potential confounders were

included in our analyses; however, other possible confounders were not measured, for example, race and severity of illness. The interpretation of our findings is also limited by the fact that our study examined CM/acupuncture use over a 12-month period—a relatively short time span in which to identify patterns and changes in CM/acupuncture use. A further limitation is the fact that the use of CM/acupuncture was self-reported by the participants and, as such, our data may reflect a degree of recall bias and variance in interpretation of CM/acupuncture between different age and ethnic groups. Another limitation is that the study sample was restricted to two age groups of women and, as such, may not be generalisable to all adult Australian women. All these limitations arise from the fact that our study was derived from a larger project that was not primarily designed to determine CM/acupuncture use. Nevertheless, these limitations are countered by the fact that the ALSWH dataset offered access to a large, nationally representative sample that could be used to explore the characteristics of women using CM and acupuncture.

CONCLUSION

The use of CM/acupuncture among young and middle-aged women is positively associated with healthy lifestyle choices (smoking, exercise level) and health status (chronic illnesses). There is a need for further research to examine the details, challenges and potential benefits of CM/acupuncture use for women's health to aid provision of safe and effective care. Our analyses identified particular conditions associated with CM/acupuncture use for the two cohorts of women, including low iron levels, endometriosis, CFS and arthritis. Healthcare practitioners treating women with these conditions need to be aware of the greater likelihood of CM/acupuncture use by their patients in order to help advise women regarding efficacy and safety.

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Contributors LY conceived and designed the study. LY, DWS and JA analysed the data. LY wrote the draft and the final manuscript. All authors read and criticised the draft. All authors read and approved the final manuscript.

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4.2 Analysis of the utilisation of traditional Chinese medicine for women with arthritis: results from the 45 and Up Study sub-study

4.2.1 Introduction

The results within this section have been published as below:

Yang, L., Peng, W., Sibbritt, D. and Adams, J. Prevalence and characteristics of Australian women aged 45 and older who consult acupuncturists for their osteoarthritis. *The International Journal of Clinical Practice*, 71(12).

This section directly addresses the research questions outlined in Section 1.2.2: "What are the demographic characteristics of Australian women with arthritis who use TCM? What is the association between women's use of TCM and a wide range of conventional healthcare choices and other complementary and alternative medicine (chiropractic, homeopathy, naturopathy, etc.) amongst women with arthritis?" The significant association between women with OA and their use of acupuncture has been identified.

This section examined the use of acupuncture from a nationally representative sample of women with OA aged 45 and older. The results from the secondary data analyses show considerable acupuncture use amongst women with OA. Moreover, acupuncture use has been identified positively associated with women experiencing longer duration of time since initial diagnosis of OA, undertaking more exercise, living in a rural area, having consulted a psychologist, and having consulted another CAM practitioner.

4.2.2 Prevalence and characteristics of Australian women aged 45 and older who consult acupuncturists for their osteoarthritis

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Prevalence and characteristics of Australian women aged 45 and older who consult acupuncturists for their osteoarthritis

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Summary

Background: There is growing acupuncture use amongst people with osteoarthritis, and acupuncture has been shown to have a positive effect on osteoarthritis. The aim of the study is to identify the characteristics of Australian women who consult acupuncturists for osteoarthritis treatment in order to help inform patients, practitioners and policy makers about the range of health care options accessed by older women with osteoarthritis.

Methods: The research reported here involved participants from a sub-study of the Sax Institute's 45 and Up Study in Australia. The data of 403 Australian women aged 45 and over with osteoarthritis were analysed. Chi-squared tests and stepwise multiple logistic regression modelling were used to determine the characteristics of women who used acupuncture for the treatment of their osteoarthritis.

Results: Analysis revealed that 7.7% of women reported using acupuncture in the previous 12 months for their osteoarthritis. Acupuncture use is positively associated with women experiencing longer duration of time since initial diagnosis of osteoarthritis (OR = 1.04), undertaking more exercise (OR = 5.41), living in a rural area (OR = 3.62), having consulted a psychologist (OR = 12.21), and having consulted another complementary and alternative medicine practitioner (OR = 4.18).

Conclusions: Our study reveals considerable acupuncture use amongst women with osteoarthritis. There is a need for health care practitioners to be mindful of acupuncture use among their patients presenting with osteoarthritis. Further research is needed to examine the potential benefits of acupuncture for osteoarthritis and to help inform efficient and safe use of this treatment alongside conventional care.

1 | INTRODUCTION

Osteoarthritis—the most common form of arthritis—is a degenerative condition that mostly affects the hands, spine and joints such as hips, knees and ankles, and usually deteriorates over time.[1] Osteoarthritis is also the predominant condition leading to knee and hip replacement surgery in Australia.[2] The prevalence of osteoarthritis increases with age[3] and is more common in women than men,[3,4] especially from 45 years and over.[5] Approximately 2.1 million adults in Australia have osteoarthritis[6] and nearly 11% of the population are predicted to suffer from osteoarthritis by 2020.[7] There is no cure for osteoarthritis[8] with both pharmacologic and non-pharmacologic management of osteoarthritis focusing on controlling pain and reducing functional limitation.[9] Treatment choices for osteoarthritis fall into four main categories: non-pharmacologic, pharmacologic, surgical and complementary and alternative medicine (CAM).[10] The most effective surgical intervention for osteoarthritis is total joint replacement[10] while controlled trials comparing many prosthetic devices are lacking.[10]

A variety of CAM treatments are used amongst people with osteoarthritis around the world[1,11,12] and acupuncture—the penetration of the skin with thin, solid, metal needles that are subsequently manipulated by hand (manual acupuncture, MA) or by electrical stimulation

(electro-acupuncture, EA)[13]—is one CAM that appears to be popular amongst people with osteoarthritis.[1] Acupuncture use is associated with improvement in physical function and pain reduction amongst people with osteoarthritis.[9,14,15] Moreover, the American College of Rheumatology has recommended treatment with acupuncture alongside conventional care for patients with knee osteoarthritis who have chronic moderate to severe pain.[16] Almost 50% of patients with osteoarthritis who use CAM report such treatment as being somewhat or very effective[1] and CAM treatments such as glucosamine/chondroitin, and acupuncture are widely used for osteoarthritis.[1,10]

Acupuncture use across the general population has been growing steadily worldwide.[17] Findings from the US national health interview survey estimate that acupuncture users increased from 4.2% to 6.7% of the population, representing 8.19 million and 12.7 million in 2002 and 2012, respectively.[18,19] In Australia, acupuncture was used by 9.2% of 1067 adults in 2005 and it has been estimated that Australian adults made 10.2 million visits to acupuncturist over the 12 month period from 2004 to 2005.[20] In addition, research has shown that 9.5% of 8010 Australian women aged 34–39 had used acupuncture in 2012.[21]

Many studies have reported the characteristics of people with osteoarthritis who use CAM.[1,11,12] Few studies reporting the characteristics of people with osteoarthritis who use acupuncture, some early research has identified insights such as more women (1.3%, n = 1563) use acupuncture for their knee osteoarthritis compared with men (1.0%, n = 1116) and that people with osteoarthritis who use acupuncture have an average of 8.4 treatments over a 12 month period.[22] Unfortunately, there has been no large-scale analyses of the characteristics of women with osteoarthritis who use acupuncture to date. In direct response to this research gap, the study reported in this paper focuses upon examining the characteristics of Australian women aged 45 and over who use acupuncture to treat their osteoarthritis symptoms.

What's known

The prevalence of osteoarthritis increases with age and is more common in women than men, especially from 45 years and over. Acupuncture use has been growing steadily worldwide and acupuncture has been shown to reduce pain and improve physical function amongst people with osteoarthritis.

What's new

There have been no large-scale analyses of the characteristics of women with osteoarthritis who use acupuncture to date. In direct response, this paper focuses upon examining the characteristics of Australian women aged 45 and over who use acupuncture to treat their osteoarthritis symptoms, in order to help inform patients, practitioners and policy makers about the range of health care options accessed by older women with osteoarthritis.

2 | METHOD

2.1 | Data source and sample

The sample is drawn from a sub-study of the Sax Institute's 45 and Up Study in the State of New South Wales, Australia. This project, conducted in 2016, involved 800 women who indicated that they had been diagnosed by a doctor with having osteoarthritis and who were mailed a sub-study questionnaire. Of these women, 403 (50.4%) returned completed sub-study questionnaires.

The Sax Institute's 45 and Up Study is the largest study of healthy ageing conducted in the Southern Hemisphere involving over 266 000 men and women aged 45 and older who reside in the State of New South Wales, Australia.[23] The 45 and Up Study is described in detail elsewhere[23] but briefly participants were randomly selected from the Department of Human Services (formerly Medicare Australia) enrolment database, and entered the study by completing a baseline postal questionnaire and providing written consent to have their health followed over time.[23]

Ethical approval for the use of the sub-study dataset reported in this paper was gained from the Human Research Ethics Committee at the University of Technology Sydney.

2.2 | Demographic characteristics

In this sub-study, area of residence was assigned according to the Accessibility Remoteness Index of Australia Plus[24] score for each participant's postcode. Participants were asked about their current marital status, highest educational qualification completed, how they manage their income (no or little difficulty, some difficulties, struggles with income), and level of private health care insurance.

2.3 | Health status

Participants were asked to rate their overall health and overall quality of life on a 5-point Likert scale. They were also asked about their history of smoking, amount of alcohol consumption (non-drinker, low risk, risky based on Australian Alcohol Guidelines classification), and height and weight, to enable a body mass index to be calculated. Participants were provided with a list of diseases and asked if they had been treated/diagnosed for any of these diseases in the past 12 months.

2.4 | Visits to other health practitioners

Participants were asked whether they consulted with health practitioners for their osteoarthritis during the past 12 months. Participants were provided with a list of health practitioners. Moreover, participants were asked whether they consulted with any complementary health practitioners during the past 12 months with a list of CAM practitioners.

2.5 | Measures of complementary health products and/or practices

Participants were asked whether they had used any complementary health products and/or practices for their osteoarthritis during the past 12 months. Participants were provided with a list of products and practices, including aromatherapy oils, herbal medicines, homeopathic remedies, meditation by yourself (without instructor), yoga by yourself (without instructor), physical activities/exercises, multivitamins, glucosamine/chondroitin, and fish oil and were asked how many times did they take/use them during the past 12 months.

2.6 | Outcome measure

Women were asked to self-report whether they had consulted an acupuncturist (yes or no) for their osteoarthritis during the past 12 months.

2.7 | Statistical analyses

The demographic and health status characteristics of acupuncture users and non-users were compared using chi-squared tests and Fishers Exact tests, where appropriate. Logistic regression modelling, which included all demographic and health status characteristics variables that had a bivariate $P < .2$, was conducted using a forward stepwise method, to determine the most parsimonious model for predict use of acupuncture. The model building process utilised the likelihood ratio test to compare competing models. A $P < .05$ was adopted for statistical significance.

3 | RESULTS

Of 403 women with osteoarthritis who responded to the sub-study questionnaire, 7.7% (n = 31) had used acupuncture for their osteoarthritis in the previous 12 months. The non-respondents were in comparison with these respondents, no statistical differences between age and region. A comparison of demographic characteristics between participants with osteoarthritis who used acupuncture and those with osteoarthritis who did not use acupuncture is shown in Table 1. There are no statistically significant differences between the respondents and non-respondents in terms of age and region. Acupuncture users were more likely to reside in non-urban areas than those who did not use acupuncture ($P = .022$). No statistically significant associations were observed between the remaining characteristics and use of acupuncture.

Table 2 shows the comparisons between participants who used acupuncture for their osteoarthritis in the previous 12 months and those who did not use acupuncture for their osteoarthritis in the previous 12 months, by health status characteristics. A statistically significant difference was observed between women's use of acupuncture and time since original diagnosis of osteoarthritis, where women who used acupuncture had, on average, been diagnosed with osteoarthritis for 19.3 years, compared with 15.0 years for women who did not use acupuncture ($P = .048$). No statistically significant associations were observed between the remaining health status characteristics and use of acupuncture.

TABLE 1 Associations between acupuncture use and demographic characteristic of women with arthritis in the past 12 mo

Characteristics	Acupuncture use		*P*-value
	Yes (%; n = 31)	No (%; n = 372)	
Area of residence			
Urban	31.0	53.1	.022
Non-urban	69.0	46.9	
Marital status			
Single	3.2	5.2	.203
Married/de facto/ living with a partner	74.2	57.8	
Widowed/divorced/ separated	22.6	37.1	
Private health insurance			
No	20.0	31.1	.202
Yes	80.0	68.9	
Highest qualification			
No formal school	12.9	6.0	.063
School only	16.1	35.6	
Trade/apprentice/ diploma	41.9	27.7	
University/higher degree	29.0	30.7	
Income management			
No or little difficulty	71.0	66.1	.073
Some difficulties	29.0	21.9	
Struggles with income	0.0	12.0	
	M (SD)	*M* (SD)	
Age	67.8 (9.0)	70.8 (8.8)	.073
BMI	30.0 (7.0)	28.9 (7.1)	.407

The associations between the participants' consultations with health practitioners and use of acupuncture are presented in Table 3. Compared with acupuncture non-users, acupuncture users were more likely to consult a general practitioner ($P = .042$), a dietitian ($P = .012$) and a CAM practitioner ($P < .001$). Moreover, participants who reported visiting a medical specialist ($P = .006$), a psychologist ($P = .004$) and a physiotherapist ($P = .040$) were all higher users of acupuncture.

Table 4 shows the associations between participants' use of complementary health products and practices and use of acupuncture. Compared with those women who did not use acupuncture, women who used acupuncture were more likely to undertake physical activities/exercises ($P < .001$), and consume multivitamins ($P < .001$).

The statistically significant predictors of acupuncture use by women with osteoarthritis, as determined by logistic regression modelling, are

TABLE 2 Health status characteristics of people with osteoarthritis by acupuncture use in the past 12 mo

Characteristics	Acupuncture use		*P*-value
	Yes (%; n = 31)	No (%; n = 372)	
Physical activity			
Inactive/sedentary	30.0	33.4	.890
Moderately active	13.3	14.5	
Highly active	56.7	52.1	
Smoking			
Non-smoker	93.3	87.6	.728
Ex-smoker	6.7	8.0	
Current smoker	0.0	4.4	
Alcohol			
Non-drinker	31.0	45.1	.179
Low risk	65.5	47.8	
Risky	3.5	7.1	
Sleep			
Not optimal	45.2	43.9	.889
Optimal	54.8	56.1	
Anxiety/nervous disorder			
No	77.4	84.1	.331
Yes	22.6	15.9	
Asthma			
No	87.1	85.2	.766
Yes	12.9	14.8	
Cancer (excluding skin cancer)			
No	96.8	95.7	.775
Yes	3.2	4.3	
Depression			
No	77.4	85.5	.229
Yes	22.6	14.5	
Diabetes			
No	90.3	91.9	.753
Yes	9.7	8.1	
Heart disease			
No	87.1	89.5	.675
Yes	12.9	10.5	
Hypertension			
No	51.6	67.7	.068
Yes	48.4	32.3	
Osteoarthritis			
No	19.3	33.1	.116
Yes	80.7	66.9	
Osteoporosis			
No	71.0	78.9	.313
Yes	29.0	21.1	
Parkinson's disease			
No	100.00	99.46	.999
Yes	0.00	0.54	
	M (SD)	*M* (SD)	
General health	6.9 (1.3)	7.2 (1.7)	.390
Years since osteoarthritis diagnosis	19.3 (12.7)	15.0 (11.7)	.048
Severity of osteoarthritis	5.6 (2.2)	5.1 (2.4)	.240

presented in Table 5. The Hosmer and Lemeshow goodness-of-fit statistic for this regression model was insignificant (*P* = .162), indicating a good fit for this model. Women who consulted CAM practitioners had higher odds (OR = 4.18, 95% CI 1.79-9.77) of using acupuncture compared with those who did not consult CAM practitioners. Women who undertook physical activities/exercises had higher odds (OR = 5.41, 95% CI 2.07-14.15) of using acupuncture compared with women who did not undertake physical activities/exercises. Women who consulted a psychologist had higher odds (OR = 12.21, 95% CI 1.99-74.81) of using acupuncture compared with women who did not consult a psychologist. Women who resided in non-urban areas had higher odds (OR = 3.62, 95% CI 1.45-9.01) of using acupuncture compared with women who resided in urban areas. Longer duration of time since initial diagnosis of osteoarthritis was associated with higher odds of acupuncture use (4% increased odds for every year since initial diagnosis of osteoarthritis) compared with non-acupuncture use (OR = 1.04; 95% CI 1.00-1.07).

4 | DISCUSSION

This study is the first to report findings from a large-scale survey of the prevalence and characteristics of older women with osteoarthritis who use acupuncture. The analyses from the study identify a number of interesting findings.

It is recommended that acupuncture can be used alongside conventional care for people with knee osteoarthritis,[16] so it is not surprising the prevalence of acupuncture use amongst this study sample was 7.7%. Moreover, the result is higher than that previously reported amongst patients with osteoarthritis.[12,25] For example, it was reported that 1.8% of 1121 US adults aged 65 and older with knee osteoarthritis used acupuncture[12] and 3.4% of 58 osteoarthritis and rheumatoid arthritis patients were reported to have used acupuncture for their symptoms in Lebanon.[25] The disparity between the prevalence rates of this finding and these previous studies may be explained by the fact this study is focused exclusively on women—who have been reported to experience much higher rates of osteoarthritis than men[26] and who when suffering from osteoarthritis are more likely to use CAM

TABLE 3 Associations between health practitioners' consultations and acupuncture use for osteoarthritis in the past 12 mo

Health practitioners	Acupuncture use (%)		*P*-value
	Yes (n = 31)	No (n = 372)	
General practitioner			
No	19.3	37.6	.042
Yes	80.7	62.4	
Medical specialist			
No	51.6	74.5	.006
Yes	48.4	25.5	
Hospital doctor			
No	100.0	93.6	.240
Yes	0.0	6.4	
Nurse			
No	100.0	95.4	.631
Yes	0.0	4.6	
Pharmacist			
No	74.2	83.9	.167
Yes	25.8	16.1	
Counsellor			
No	100.0	98.4	.999
Yes	0.0	1.6	
Psychologist			
No	90.3	98.4	.004
Yes	9.7	1.6	
Dietitian			
No	87.1	96.5	.012
Yes	12.9	3.5	
Physiotherapist			
No	58.1	75.0	.040
Yes	41.9	25.0	
Occupational therapist			
No	93.5	96.8	.346
Yes	6.5	3.2	
CAM practitioners[a]			
No	35.5	74.2	<.001
Yes	64.5	25.8	

[a]CAM practitioners excludes acupuncturists.

TABLE 4 Association between use of complementary health products or practices and use of acupuncture amongst women with osteoarthritis in the past 12 mo

Complementary products and practices	Acupuncture use (%)		*P*-value
	Yes (n = 31)	No (n = 372)	
Aromatherapy oils			
No	83.9	94.4	.022
Yes	16.1	5.6	
Herbal medicines			
No	77.4	93.5	.001
Yes	22.6	6.5	
Homeopathic remedies			
No	96.8	98.4	.431
Yes	3.2	1.6	
Meditation			
No	71.0	90.9	.001
Yes	29.0	9.1	
Yoga			
No	93.5	96.2	.461
Yes	6.5	3.8	
Physical activities/exercises			
No	22.6	60.5	<.001
Yes	77.4	39.5	
Multivitamins			
No	48.4	79.6	<.001
Yes	51.6	20.4	
Glucosamine/chondroitin			
No	61.3	68.3	.424
Yes	38.7	31.7	
Fish oil			
No	48.4	61.8	.141
Yes	51.6	38.2	

(including acupuncture) compared with their male counterparts.[27] This research suggests those designing treatment plans for people with osteoarthritis need to be mindful of gender aspects and there is a need to undertake further research on the decision-making of women with arthritis around their TCM and related health service use.

The analyses from this study show women with osteoarthritis who consult CAM practitioners are also more likely to use acupuncture, which is in accordance with other studies suggesting people with osteoarthritis may often use multiple types of CAM treatments.[1,28] Moreover, acupuncture services are covered by most major Australian private health insurance with other CAM modalities such as chiropractors and osteopath.[20] However, there remains a lack of population-based, large-scale study data examining the association between acupuncture use and consultation with other health practitioners (including other CAM practitioners) among women with osteoarthritis and further research on this topic is needed.

It is interesting to note that women with osteoarthritis who used acupuncture in this study were more likely to visit a psychologist than women with osteoarthritis who did not use acupuncture. This association may be explained, partly at least, by the relationship between acupuncture and mental problems.[29] Specifically, acupuncture is widely used for psychological problems such as anxiety[30] and depression,[31] and women who consult an acupuncturist have significantly poorer mental and physical health than those women who do not use acupuncture.[32] As such, it is important for health care providers such as

TABLE 5 Multiple logistic regression model for predicting use of acupuncture in women with osteoarthritis in the past 12 mo

Predictors of acupuncture use	Adjusted odds ratio	95% CI	*P*-value
CAM practitioners visits			
No	1.00	–	.001
Yes	4.18	1.79-9.77	
Physical activities/exercise			
No	1.00	–	.001
Yes	5.41	2.07-14.15	
Psychologist visits			
No	1.00	–	.007
Yes	12.21	1.99-74.81	
Area of residence			
Urban	1.00	–	.006
Non-urban	3.62	1.45-9.01	
Duration of osteoarthritis (y)	1.04	1.00-1.07	<.001

CI, confidence interval.

acupuncturists and general practitioners to consider potential psychological implications when consulting with women with osteoarthritis and more qualitative research is needed to explore the reasons for and outcomes of women with osteoarthritis seeking care from acupuncturists to treat their symptoms.

The finding of this study that women who used acupuncture for their osteoarthritis were more likely to undertake physical activity adds support to the findings of a previous study indicating Australians with osteoarthritis perceive exercise as a treatment which is very or extremely helpful for treating osteoarthritis.[11] The finding from this study is not surprising given that moderate exercise and regular physical activity have been shown to have a positive effect on the symptoms of osteoarthritis.[33] However, a randomised controlled trial conducted in the UK revealed no additional improvement in pain scores amongst 352 adults with knee osteoarthritis who received acupuncture in addition to a course of advice and exercise provided by physiotherapists when compared with those who received advice and exercise alone.[34]

This study also reveals that Australian women who use acupuncture for their osteoarthritis are more likely to reside in non-urban areas compared with women who reside in urban areas. This finding is supported by previous studies of CAM more broadly which have shown the prevalence of CAM use in rural regions to be generally higher than in urban areas of Australia[35] with acupuncturists widely consulted in rural Australian localities.[36] Another interpretation of this study finding that women with osteoarthritis who use acupuncture are more likely to reside in rural areas may be that there is less availability of conventional health care services and relatively higher levels of dissatisfaction with conventional medical providers among rural residents which may result in relatively higher consumption of CAM (including acupuncture) in rural settings.[35] Nevertheless, more work is required to examine the finer details of how geographical location may influence acupuncture use amongst female (and male) osteoarthritis sufferers.

The analyses from this study show women aged 45 and over with osteoarthritis who use acupuncture are more likely to have longer duration of time since initial diagnosis of osteoarthritis compared with non-acupuncture users. This finding is in line with the results from a recent prospective online survey of 170 people with arthritis from Canada which found that CAM users had longer years since diagnosis (12.49) compared with CAM non-users (10.53).[37] Moreover, previous research has suggested that osteoarthritis patients with longer time since diagnosis tend to be referred to a wider range of specialists and health care providers when compared with those more newly diagnosed with osteoarthritis[38]—it seems likely from these results that, in some cases at least, such an extended network may possibly include contact with and consideration of acupuncturists.

This research is limited to investigation of women aged 45 and over and it is important to maintain caution in generalising these results to all women. Moreover, the interpretation of these findings is limited by the fact that health and health care use in this study was self-reported by the participants and as a result these findings may be open to recall bias. The sub-study questionnaire does not have measures of radiological score and functional status (WOMAC) which could have measured osteoarthritis characteristics. The sample of this study is relatively small, as such caution should be taken when interpreting the findings. Nevertheless, these limitations are countered by the first opportunity to survey older women who consulted acupuncturists for their osteoarthritis from an established, large dataset.

5 | CONCLUSION

Our findings show women aged 45 and older and who used acupuncture for their osteoarthritis are more likely to live in rural areas, suffer from longer duration of osteoarthritis, undertake physical exercises and to visit to a CAM practitioner and a psychologist when compared with women who did not use acupuncture for their osteoarthritis. Further research is required to explore these associations in detail, with potential implications for health care practitioners and policy makers.

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AUTHOR CONTRIBUTIONS

L.Y., D.W.S. and J.A. conceived and designed the study. L.Y., D.W.S., and W.B.P. analysed the data. L.Y. wrote an initial draft and all authors contributed to later drafts. All authors read and approved the final manuscript.

DISCLOSURES

All authors claimed no conflicts of interest.

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4.3 The treatment of arthritis in traditional Chinese medicine: an examination of the perceptions of traditional Chinese medicine practitioners.

4.3.1 Introduction

The results within this section have been published as below:

Yang, L., Peng, W., Sibbritt, D. and Adams, J. (2018). Treating people with arthritis with traditional Chinese medicine (TCM): an examination of the perception of TCM practitioners. *Acupuncture in Medicine*. (In press).

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This section directly addresses the research question outlined in Section 1.2.2: "What are the characteristics of TCM practitioners in Australia, and the relationships between TCM practitioners and conventional healthcare providers, and other CAM providers in Australia? What are the perceptions of Australian TCM practitioners on using TCM to treat arthritis?"

Given the emerging evidence with regard to the effectiveness of TCM for the management of arthritis (identified in Section 1.6.3) and the fact that a considerable number of women with arthritis utilise TCM, there is a need to explore the perceptions of TCM practitioners regarding their treatment of arthritis in order to evaluate TCM provision and its role in providing effective and safe arthritis care.

The sample from this section was obtained from the established PRACI project. The findings from this section provide the first-ever information on TCM practitioners' perceptions regarding arthritis, including the practitioners' characteristics, practice characteristics and clinical management regarding treatment of arthritis.

4.3.2 Treating people with arthritis with traditional Chinese medicine (TCM): an examination of the perceptions of TCM practitioners

Original paper

Treating people with arthritis with traditional Chinese medicine (TCM): an examination of the perception of TCM practitioners

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ABSTRACT

Introduction Emerging evidence has shown that traditional Chinese medicine (TCM) has a positive effect on arthritis. This research provides the first critical, systematic examination of TCM practitioners' perceptions of TCM use for people with arthritis.

Methods An online survey was distributed to all TCM professionals including acupuncturists and Chinese herbal medicine practitioners registered with the Practitioner Research and Collaborate Initiative (PRACI) practitioner database. The survey questions focus on practitioner characteristics, practice characteristics and clinical management approaches regarding arthritis care.

Results The survey attracted a response rate of 53% (n=52). The average age of the respondents was 49.9 years, more than half were female, and the majority held a bachelor degree or higher qualification. More than two thirds of TCM practitioners in our study worked with other health professionals, while they had a high level of referral relationships with a wide range of conventional, allied health and complementary and alternative medicine (CAM) providers. Most of the TCM practitioners reported that their patients with arthritis used other treatments alongside TCM and a large number of the TCM practitioners who participated believed that TCM was effective for treating arthritis.

Conclusions The TCM profession represents a substantial component of the healthcare field in Australia, and treating patients with arthritis appears to be an important area of TCM practice, among others. Further detailed research is needed to help ensure effective, safe patient care for those with arthritis who may be utilising TCM alongside a broader range of conventional medicine, allied health, and other CAM treatments.

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INTRODUCTION

Traditional Chinese medicine (TCM), a core part of complementary and alternative medicine (CAM) in many countries, has attracted increasing attention from physical and mental health studies over recent years.[1–3] The TCM profession is now a registered healthcare profession across Australia, under the Health Practitioner Regulation National Law.[4] In Australia, TCM practitioners can register in one or more divisions: 36% of TCM practitioners are registered in the acupuncture division only, 1% of TCM practitioners are registered in the Chinese herbal medicine (CHM) division only, and 45% of TCM practitioners are registered as both CHM practitioners and acupuncturists (CHM/ACU practitioners).[5] Moreover, CHM/ACU practitioners constitute 11% of the total CAM providers in rural and regional Australia.[6] A previous study reported that acupuncturists and CHM practitioners in Australia were estimated to provide 10.2 million and 2.1 million consultations annually, respectively.[7] Arthritis—a chronic debilitating disease comprising over 100 different types of disorders and conditions that affect joints, the surrounding tissue and other connective tissues[8]—has no simple cure, with treatment directed at improving symptoms and decreasing the progression of the disease.[9] Osteoarthritis (OA) and rheumatoid arthritis (RA) are the most common forms of arthritis and are also the leading causes of disability among older adults.[10 11] Based on a recent population-based cohort study conducted in Australia, among middle-aged women who used CHM and acupuncture, 37.1% used CHM for their arthritis while 46.4% used acupuncture.[12]

Research has shown statistically significant and clinically relevant benefits for people with arthritis using TCM.[13–17] Acupuncture has been found to have a positive effect on the subsidence of inflammation in RA and provides pain relief to OA sufferers.[18–20] The beneficial

effects of acupuncture for arthritis pain may include prevention of further cartilage erosion as well as general analgesic mechanisms.[14] The effective ingredients of some anti-rheumatic CHMs have been found to potentially inhibit RA development.[21] Furthermore, studies have provided evidence that acupuncture is effective at improving physical function among people with arthritis.[22 23]

Despite the emerging evidence of the effectiveness of TCM for the management of arthritis and the growing interactions between TCM practitioners and conventional medical providers,[24 25] to our knowledge there has been no examination of the treatment for arthritis from the perspective of TCM practitioners. In response, this paper reports data from a survey of a sample of registered TCM practitioners regarding their perceptions of TCM use for arthritis, aiming to describe the characteristics of Australian TCM practitioners (CHM practitioners and acupuncturists) for the Practitioner Research and Collaboration Initiative (PRACI), and to determine the practice characteristics and clinical management of TCM practitioners regarding patients with arthritis.

METHODS

Participants and recruitment

PRACI is an innovative, multi-modality practice-based research network (PBRN) that represents 14 CAM professions across Australia (https://praci.com.au/), including CHM practitioners, acupuncturists, aromatherapists, Ayurvedic practitioners, Bowen therapists, homoeopaths, kinesiologists, massage therapists, myotherapists, naturopaths, nutritionists (non-dietetic), reflexologists, Western herbalists and yoga practitioners. It is the largest known PBRN for complementary healthcare in the world and was launched in 2015.[26] PRACI provides the opportunity to advance TCM practice and knowledge by establishing research in grassroots clinical practice and allows for effective relationship building between TCM practitioners and researchers.[27]

A total of 98 TCM practitioners who had previously consented to be included in the PRACI practitioner database were identified and all of them were invited via email to participate in our survey of arthritis management from 12 December 2016 to 12 March 2017. Two reminder emails were sent on 12 January and 12 February, respectively.

Instrument and ethics

Our survey included questions modified from previous CAM workforce surveys and focused on TCM practitioners' perceptions about arthritis care (ie, respondents were asked related questions about TCM practitioner characteristics, practice characteristics, and clinical management with respect to arthritis). The research team of this study was supported by the PRACI Steering Committee on survey data collection and survey processes. Content validation of the survey was undertaken via pilot work with a small convenience sample of TCM practitioners. The TCM practitioners involved in the pilot testing were invited to comment and provide feedback on all aspects of the questionnaire, such as the topics covered, the wording of the survey content, the formatting, and the broader issues and considerations around ease and duration of completion. The methods and outcomes pertaining to the validity and reliability of this survey are based on the measurements from a previous evidence-based practice and attitude and utilisation survey for CAM practitioners and are described in detail elsewhere.[28] Ethics approval was granted by the University of Technology Sydney Human Research Ethics Committee (approval number: ETH16-0631).

Practitioner characteristics

Participants were asked about their sociodemographic characteristics, such as age, gender and ethnicity. Practitioners were also asked to provide information about their highest qualifications in acupuncture and CHM, and countries where they had received training. Respondents were grouped into professional categories based on their reported qualifications (acupuncturist only and CHM/ACU practitioners).

Practice characteristics

Questions were asked regarding the practice characteristics of respondents, such as the location of their clinical practice(s). This included the State or Territory in which they practised, as well as the category of their practice locality (urban, rural, and remote). Practitioners were also asked to report the frequency with which they send/receive referrals from a range of health practitioners (general practitioners (GP), medical specialists, psychologists/counsellors, occupational therapists, physiotherapists, naturopaths, chiropractors, and osteopaths).

Clinical management regarding arthritis

Respondents were asked about their treatment plan for patients with arthritis including questions about average patient care hours per week, average number of patient visits per week, average number of treatment consultations per patient, communication between TCM practitioners and patients, primary treatments for management of different arthritic symptoms ("which arthritic condition do you treat primarily with acupuncture/CHM as the main therapy?") and their personal beliefs regarding treating arthritis with TCM.

Statistical analyses

Data were extracted from SurveyGizmo to a Microsoft Excel spreadsheet and imported into Stata 13.1 statistical software for analyses. Data were checked for plausibility and cleaned for outliers. X^2 tests were

Table 1 Demographic characteristics of acupuncturists and CHM/ACU practitioners

Demographic characteristics	All TCM* practitioners (n=52) n (%)	CHM/ACU practitioners (n=22) n (%)	Acupuncturists (n=30) n (%)	P value
Gender				
Female	28 (54)	10 (45)	18 (60)	0.299
Male	24 (46)	12 (55)	12 (40)	
Ethnicity				
Asian	7 (13)	3 (14)	4 (13)	0.641
White/Caucasian	45 (86)	19 (86)	26 (87)	
Acupuncture training in China				
No	32 (61)	10 (45)	22 (73)	0.041
Yes	20 (38)	12 (55)	8 (27)	
CHM training in China				
No	39 (75.)	10 (45)	29 (97)	<0.001
Yes	13 (25)	12 (55)	1 (3)	
Highest acupuncture qualification				
Diploma	7 (13)	0	7 (23)	0.070
Bachelor's degree	30 (58)	15 (68)	15 (50)	
Master's degree	8 (15)	5 (23)	3 (10)	
PhD	2 (4)	0	2 (7)	
Other	5 (10)	2 (9)	3 (10)	
Highest CHM qualification				
Diploma	1 (2)	1 (5)	–	<0.001
Bachelor's degree	13 (25)	13 (59)	–	
Master's degree	5 (10)	5 (23)	–	
PhD	0	0	–	
Other	3 (6)	3 (14)	–	
	Mean (SD)	**Mean (SD)**	**Mean (SD)**	
Age	48.9 (11.76)	48.1 (8.99)	49.50 (13.56)	0.674

*TCM practitioners include CHM/ACU practitioners and acupuncturists.
ACU, acupuncture; CHM, Chinese herbal medicine; TCM, traditional Chinese medicine.

employed for categorical variables and Student's t-tests were employed for continuous variables.

RESULTS

A total of 98 TCM practitioners were invited, of which 52 TCM practitioners completed the survey questionnaires (response rate 53%).

Practitioner characteristics

The demographic characteristics of the participating TCM practitioners are reported in table 1. The respondents had a mean age of 48.9 years (SD 11.8) with 53.9% being female, while CHM/ACU practitioners and acupuncturists had a mean age of 48.1 years (SD 9.0) and 49.5 years (SD 13.6), respectively. The majority of TCM practitioners, including both CHM/ACU practitioners and acupuncturists, were white/Caucasian (87%).

A total of 58% (n=30) of respondents reported having obtained acupuncture qualifications only, and 42% (n=22) of respondents had both CHM qualifications and acupuncture qualifications. Of the 52 TCM practitioners with either CHM or acupuncture qualifications in our study, most of them had a bachelor degree or higher (77%). The acupuncturists' highest professional qualification was a PhD (7%), a master's degree (10%) or a bachelor's degree (50%). Of the 22 practitioners with CHM/ACU qualifications, most of them had a bachelor degree's or higher (82%), with 59% having completed a bachelor's degree and 23% a master's degree, respectively. Only a small number of CHM/ACU practitioners had a diploma as their highest relevant qualification (5%). Among the 30 practitioners in our study who had acupuncture qualifications only, 50% of them had a bachelor's degree, 23% had a diploma, 10% (n=3) had a master's degree, and 7% (n=2) held a PhD.

In addition, of all the TCM practitioners in our study, 39% (n=20) had received acupuncture training in China and 25% (n=13) had received CHM training in China.

Table 2 Practice characteristics of acupuncturists and CHM/ACU practitioners

Practice characteristics	All TCM* practitioners (n=52) n (%)	CHM/ACU practitioners (n=22) n (%)	Acupuncturists (n=30) n (%)	P value
Practice in more than one location				
No	31 (61)	12 (55)	19 (66)	0.427
Yes	20 (39)	10 (46)	10 (34)	
State/Territory of practice				
NSW/ACT	9 (18)	5 (23)	4 (14)	0.194
VIC/TAS	14 (27)	9 (41)	5 (17)	
QLD	22 (43)	7 (32)	15 (52)	
WA	2 (4)	0	2 (7)	
SA/NT	4 (8)	1 (5)	3 (10)	
Area of practice				
Urban	41 (80)	19 (86)	22 (76)	0.483
Rural/remote	10 (20)	3 (14)	7 (24)	
Work with other health professionals practising in one location:				
No other health professionals				
No	42 (82)	20 (91)	22 (76)	0.268
Yes	9 (18)	2 (9)	7 (24)	
Another acupuncturist				
No	24 (47)	9 (41)	15 (52)	0.443
Yes	27 (53)	13 (59)	14 (48)	
Another CHM practitioner				
No	37 (73)	13 (59)	24 (83)	0.061
Yes	14 (27)	9 (41)	5 (17)	
General practitioner				
No	44 (86)	21 (95)	23 (79)	0.124
Yes	7 (14)	1 (5)	6 (21)	
Medical specialist				
No	49 (96)	22 (100)	27 (93)	0.500
Yes	2 (4)	0	2 (7)	
Occupational therapist				
No	49 (96)	21 (95)	28 (97)	1.000
Yes	2 (4)	1 (5)	1 (4)	
Osteopath				
No	41 (80)	17 (77)	24 (83)	0.625
Yes	10 (20)	5 (23)	5 (17)	
Psychologist				
No	43 (81)	18 (82)	25 (86)	0.713
Yes	8 (16)	4 (18)	4 (14)	
Physiotherapist				
No	42 (82)	21 (95)	21 (72)	0.060
Yes	9 (18)	1 (5)	8 (28)	
Massage therapist				
No	25 (49)	8 (36)	17 (59)	0.115
Yes	26 (51)	14 (64)	12 (41)	
Naturopath				
No	38 (75)	17 (77)	21 (72)	0.693
Yes	13 (25)	5 (23)	8 (28)	
Chiropractor				
No	42 (82)	18 (82)	24 (83)	1.000
Yes	9 (18)	4 (18)	5 (17)	

*TCM practitioners include CHM/ACU practitioners and acupuncturists.
ACU, acupuncture; CHM, Chinese herbal medicine; TCM, traditional Chinese medicine.
ACT, Australian Capital Territory; NSW, New South Wales; NT, Northern Territory; SA, South Australia; TAS, Tasmania; QLD, Queensland; VIC, Victoria; WA, Western Australia.

Table 3 Clinical management of acupuncturists and CHM/ACU practitioners regarding arthritis care: send/receive referral with other health professionals

Clinical management	All TCM* practitioners (n=52) n (%)	CHM/ACU practitioners (n=22) n (%)	Acupuncturists (n=30) n (%)	P value
Refer to other practitioner:				
General practitioner				
No	24 (48)	11 (50)	13 (46)	0.802
Yes	26 (52)	11 (50)	15 (54)	
Medical specialist				
No	31 (69)	15 (75)	16 (64)	0.428
Yes	14 (31)	5 (25)	9 (36)	
Psychologist				
No	35 (78)	17 (81)	18 (75)	0.729
Yes	10 (22)	4 (19)	6 (25)	
Occupational therapist				
No	41 (91)	19 (90)	22 (92)	1.000
Yes	4 (9)	2 (10)	2 (8)	
Physiotherapist				
No	35 (74)	18 (86)	17 (65)	0.179
Yes	12 (26)	3 (14)	9 (35)	
Naturopath				
No	27 (55)	15 (71)	12 (43)	0.047
Yes	22 (45)	6 (29)	16 (57)	
Chiropractor				
No	35 (76)	15 (71)	20 (80)	0.497
Yes	11 (24)	6 (29)	5 (20)	
Osteopath				
No	24 (51)	10 (45)	14 (56)	0.471
Yes	23 (49)	12 (55)	11 (44)	
Another CHM practitioner				
No	26 (53)	14 (64)	12 (44)	0.181
Yes	23 (47)	8 (36)	15 (56)	
Another acupuncturist				
No	27 (56)	15 (68)	12 (46)	0.125
Yes	21 (44)	7 (32)	15 (54)	
Referrals from other practitioner:				
General practitioner				
No	30 (60)	13 (59)	17 (61)	0.907
Yes	20 (40)	9 (41)	11 (39)	
Medical specialist				
No	42 (91)	19 (90)	23 (92)	1.000
Yes	4 (9)	2 (10)	2 (8)	
Psychologist				
No	42 (89)	19 (86)	23 (92)	0.654
Yes	5 (11)	3 (14)	2 (8)	
Occupational therapist				
No	47 (94)	19 (96)	28 (100)	0.079
Yes	3 (6)	3 (14)	0	
Physiotherapist				
No	36 (77)	17 (77)	19 (76)	0.918
Yes	11 (23)	5 (23)	6 (24)	
Naturopath				
No	34 (68)	16 (73)	18 (64)	0.525

Continued

Table 3 Continued

Clinical management	All TCM* practitioners (n=52) n (%)	CHM/ACU practitioners (n=22) n (%)	Acupuncturists (n=30) n (%)	P value
Yes	16 (32)	6 (27)	10 (36)	
Chiropractor				
No	36 (75)	16 (73)	20 (77)	0.738
Yes	12 (25)	6 (27)	6 (23)	
Osteopath				
No	33 (70)	13 (59)	20 (80)	0.118
Yes	14 (30)	9 (41)	5 (20)	
Another CHM practitioner				
No	35 (47)	15 (68)	20 (80)	0.354
Yes	12 (53)	7 (32)	5 (20)	
Another acupuncturist				
No	30 (63)	14 (67)	16 (59)	0.599
Yes	18 (38)	7 (33)	11 (41)	

*TCM practitioners include CHM/ACU practitioners and acupuncturists.
ACU, acupuncture; CHM, Chinese herbal medicine; TCM, traditional Chinese medicine.

Practice characteristics

The locations of the TCM practitioners' clinical services are presented in table 2. In total, 43% of respondents were practising in the State of Queensland, 28% in Victoria/Tasmania, 18% in New South Wales/Australian Capital Territory, 8% in South Australia/Northern Territory and 4% in Western Australia. The majority (n=41; 80%) of TCM practitioners were practising in an urban location, with a smaller proportion reporting practice in rural and remote localities (n=10; 20%). A large number of TCM practitioners only practised in one location (61%), while 20 TCM practitioners practised in more than one location (39%). Furthermore, 41% of CHM/ACU practitioners practised in Victoria/Tasmania while 52% of acupuncturists practised in Queensland.

Around 18% of the participants reported being in solo practice, while the majority of TCM practitioners practised in a multi-practitioner location (82%). More specifically, 31% reported working with two other health practitioners, 33% with 3–4 other health practitioners, and 19% with 5–9 other health practitioners. The most common type of 'other health practitioner' with which the participants practised was another acupuncturist (52%), a massage therapist (50%), another CHM practitioner (27%), or a naturopath (25%). CHM/ACU practitioners reported that they were more likely to work with a massage therapist (64%) in the same practice/clinic, and acupuncturists were mostly working with another acupuncturist (48%) and/or a massage therapist (41%).

Responses of the TCM practitioners to questions regarding their referral patterns with other health practitioners are summarised in table 3. Overall, 52% of TCM practitioners had referred their patients with arthritis to a GP and 49% of them referred to an osteopath. However, only 40% and 30% of TCM practitioners reported receiving patients from a GP and an osteopath, respectively. CHM/ACU practitioners mostly referred their patients with arthritis to an osteopath (55%) or a GP (50%) and received patients with arthritis from an osteopath (41%) and/or a GP (41%). Acupuncturists mostly referred their patients with arthritis to a naturopath (57%) and/or a CHM practitioner (56%), and received patients with arthritis mostly from another acupuncturist (41%) and/or a GP (39%).

Clinical management

Table 4 shows the clinical management of TCM practitioners regarding arthritis care. In total, 82% (n=37) of TCM practitioners reported being aware of their patients with arthritis using other treatments such as anti-inflammatories, nutritional supplements and pain killers. TCM practitioners treated a range of arthritic conditions. Acupuncture was primarily used to treat OA (93%) followed by RA (78%), gout (60%) and psoriatic arthritis (29%). By comparison, CHM was used to treat RA (49%), OA (42%), gout (40%), and psoriatic arthritis (20%).

The TCM practitioners reported spending an average of 5.9 hours (SD=5.8) per week on arthritis patient care and providing an average of 6.8 (SD=8.3) arthritis patient visits per week. Moreover, the average total number of treatment consultations was 8.3 (SD=6.2) per patient with arthritis among TCM practitioners. Overall, 96% of TCM practitioners reported employing different consultation methods to explain arthritic symptoms and/or conditions to patients with arthritis, 84% employed both Chinese medical and Western medical theories for the explanation, 11% used traditional Chinese medical theory only and 5% used Western medical theory only.

Table 4 Clinical management of acupuncturists and CHM/ACU practitioners regarding arthritis care

Clinical management	All TCM* practitioners (n=52) n (%)	CHM/ACU practitioners (n=22) n (%)	Acupuncturists (n=30) n (%)	P value
Explain arthritic symptoms/conditions				
No	2 (4)	2 (10)	0	0.203
Yes	44 (96)	19 (90)	25 (100)	
How arthritic symptoms are explained				
Using traditional Chinese medical theory	5 (11)	3 (16)	2 (8)	0.458
Using Western medical theory	2 (5)	0	2 (8)	
Using both theories	37 (84)	16 (84)	21 (84)	
How the following treatments are employed in the management of patients with arthritis				
Using acupuncture only				
No	2 (5)	1 (5)	1 (4)	1.000
Yes	42 (95)	19 (95)	23 (96)	
Using CHM only				
No	23 (52)	6 (30)	17 (71)	0.007
Yes	21 (48)	14 (70)	7 (29)	
Using both acupuncture and CHM				
No	18 (41)	4 (19)	14 (61)	0.005
Yes	26 (59)	17 (81)	9 (39)	
Awareness of any patients using any other treatment(s) for their arthritic symptoms				
No	8 (18)	5 (24)	3 (13)	0.322
Yes	37 (82)	16 (76)	21 (88)	
Enquire whether arthritis patients use any other treatments				
No	1 (2)	0	1 (4)	1.000
Yes	44 (98)	21 (100)	23 (96)	
Arthritic conditions primarily treated with acupuncture				
Rheumatoid arthritis				
No	10 (22)	4 (19)	6 (25)	0.729
Yes	35 (78)	17 (81)	18 (75)	
Osteoarthritis				
No	3 (7)	0	3 (13)	0.236
Yes	42 (93)	21 (100)	21 (88)	
Psoriatic arthritis				
No	32 (711)	16 (76)	16 (67)	0.528
Yes	13 (29)	5 (24)	8 (33)	
Gout				
No	18 (40)	9 (43)	9 (38)	0.767
Yes	27 (60)	12 (57)	15 (63)	
Arthritic conditions primarily treated with CHM				
Rheumatoid arthritis				
No	23 (51)	7 (33)	16 (67)	0.038
Yes	22 (49)	14 (67)	8 (33)	
Osteoarthritis				
No	26 (58)	11 (52)	15 (63)	0.555
Yes	19 (42)	10 (48)	9 (38)	
Psoriatic arthritis				
No	36 (80)	14 (67)	22 (92)	0.061
Yes	9 (20)	7 (33)	2 (8)	
Gout				
No	27 (60)	7 (33)	20 (83)	0.001
Yes	18 (40)	14 (67)	4 (17)	

Continued

Table 4 Continued

Clinical management	All TCM* practitioners (n=52) n (%)	CHM/ACU practitioners (n=22) n (%)	Acupuncturists (n=30) n (%)	P value
Other arthritis				
No	37 (82)	19 (90)	18 (75)	0.252
Yes	8 (18)	2 (10)	6 (25)	
Arthritis patient care	Mean (SD)	Mean (SD)	Mean (SD)	
Hours/week	5.9 (5.8)	6.9 (7.8)	5.1 (3.5)	0.338
Visits/week	6.8 (8.3)	8.0 (12.1)	6.0 (4.4)	0.490
Treatment sessions/patient	8.3 (6.2)	6.8 (3.7)	9.8 (8.0)	0.159

*TCM practitioners include CHM/ACU practitioners and acupuncturists.
ACU, acupuncture; CHM, Chinese herbal medicine; TCM, traditional Chinese medicine.

Table 5 shows TCM practitioners' beliefs regarding their acupuncture and CHM practice for the treatment of arthritis. In total, 72% of TCM practitioners perceived acupuncture as effective for treating arthritis generally. Specifically, using acupuncture to treat RA (81%) and OA (93%) was rated most effective. Moreover, almost all TCM practitioners perceived acupuncture as effective for reducing pain (98%) and swelling (95%) generated by arthritis. On the other hand, approximately half of all TCM practitioners (54%) perceived CHM as effective for treating arthritis generally. A total of 76% of all TCM practitioners believed that CHM was effective for RA and OA, and a number of TCM practitioners believed CHM was effective for reducing pain (68%) and swelling (76%) caused by arthritis. A high proportion of CHM/ACU practitioners perceived acupuncture as effective for reducing pain (95%) and swelling (95%) from arthritis, and perceived CHM as effective mostly for treating RA (86%). The participating acupuncturists perceived acupuncture as effective mostly for reducing arthritis pain (100%) and swelling (96%) and OA (96%), and perceived CHM as effective mostly for reducing arthritis-related pain (70%) and swelling (70%), and OA (70%).

TCM practitioners reported discussing a wide range of topics as part of their care/management plans with arthritis patients (table 6). The most common topics discussed during consultation by TCM practitioners were physical activity/fitness (98%) and diet/nutrition (95%), followed by pain counselling (91%), smoking/drugs/alcohol (88%), ergonomic advice (86%), and nutritional supplements (86%). All the CHM/ACU practitioners discussed diet/nutrition and physical activity/fitness with their patients with arthritis while acupuncturists most commonly discussed physical activity (95%), diet/nutrition (91%) and pain counselling (91%) during their consultations.

DISCUSSION

This paper reports findings from the first in-depth arthritis-focused survey study on the perception of Australian registered TCM practitioners. Our results confirm some findings from previous reports and reveal a number of new significant insights for healthcare practitioners, policymakers and patients with arthritis. Our study identifies a high level of referrals from TCM practitioners to other health practitioners (in particular GPs, osteopaths and naturopaths). The high referral rate from TCM practitioners to GPs has also been reported in previous studies, showing a significant level of interaction between acupuncturists and GPs in Australia and New Zealand.[25 29 30] These high levels of referral may be related to individual TCM modalities, such as acupuncture, not being overwhelmingly effective for some forms of arthritis. Therefore, further investigation is warranted to examine the reasons for the high referral rates. However, our study shows that TCM practitioners report a relatively lower patient referral rate received by themselves from GPs compared with the frequency of patient referrals initiated by them to GPs. This difference may be due to the lack of large-scale evidence base for TCM efficacy in terms of its acceptance by GPs[31] and/or the relative lack of CAM (including TCM) information and training for GPs.[32] Further, GPs have referred to CAM practitioners mainly at the request of patients.[33] Yet, many CAM users do not inform their doctors about such CAM use[8 30] and more studies are required to examine and inform communication between GPs and TCM practitioners.

In our study most TCM practitioners reported that their patients with arthritis also employed other treatments for their arthritic symptoms. This finding confirms the high prevalence of concurrent use of CAM (including herbal medicine and acupuncture) and conventional medicine for people with arthritis identified in previous work.[8 29] Moreover, CAM users have been reported to expect a very wide range of outcomes from their CAM use including control over health, general well-being promotion and improvements in their quality of life, which may result in multiple use of CAM modalities and concurrent use of CAM and conventional medicine.[34] However,

Table 5 Practitioners' beliefs regarding acupuncture and CHM for the treatment of arthritis

Practitioner beliefs	All TCM* practitioners (n=52) n (%)	CHM/ACU practitioners (n=22) n (%)	Acupuncturists (n=30) n (%)	P value
Acupuncture is effective for treating the following:				
Rheumatoid arthritis				
Agree	35 (81)	18 (86)	17 (77)	0.698
Neutral/disagree	8 (19)	3 (14)	5 (23)	
Osteoarthritis				
Agree	40 (93)	19 (90)	21 (95)	0.607
Neutral/disagree	3 (7)	2 (10)	1 (5)	
Psoriatic arthritis				
Agree	22 (51)	13 (62)	9 (41)	0.169
Neutral/disagree	21 (49)	8 (38)	13 (59)	
Gout				
Agree	32 (74)	16 (76)	16 (73)	0.795
Neutral/disagree	11 (26)	5 (24)	6 (27)	
All arthritis				
Agree	31 (72)	14 (67)	17 (77)	0.438
Neutral/disagree	12 (28)	7 (33)	5 (23)	
Reducing pain				
Agree	42 (98)	20 (95)	22 (100)	0.488
Neutral/disagree	1 (2)	1 (5)	0	
Reducing swelling				
Agree	41 (95)	20 (95)	21 (95)	1.000
Neutral/disagree	2 (5)	1 (5)	1 (5)	
CHM is effective for treating the following:				
Rheumatoid arthritis				
Agree	31 (76)	18 (86)	13 (65)	0.159
Neutral/disagree	10 (24)	3 (14)	7 (35)	
Osteoarthritis				
Agree	31 (76)	17 (81)	14 (70)	0.484
Neutral/disagree	10 (24)	4 (19)	6 (30)	
Psoriatic arthritis				
Agree	21 (51)	14 (67)	7 (35)	0.043
Neutral/disagree	20 (49)	7 (33)	13 (65)	
Gout				
Agree	28 (68)	17 (81)	11 (55)	0.100
Neutral/disagree	13 (32)	4 (19)	9 (45)	
All arthritis				
Agree	22 (54)	12 (57)	10 (50)	0.647
Neutral/disagree	19 (46)	9 (43)	10 (50)	
Reducing pain				
Agree	28 (68)	14 (67)	14 (70)	0.819
Neutral/disagree	13 (32)	7 (33)	6 (30)	
Reducing swelling				
Agree	31 (76)	17 (81)	14 (70)	0.484
Neutral/disagree	10 (24)	4 (19)	6 (30)	

*TCM practitioners include CHM/ACU practitioners and acupuncturists.
ACU, acupuncture; CHM, Chinese herbal medicine; TCM, traditional Chinese medicine.

topics with regards to interactions between TCM (Chinese herbal medicine in particular) and Western medications have been actively researched in clinical medicine.[35 36] A cross-sectional study from Canada focusing on CAM use among 281 OA patients indicated that 7.8% were using CAM that could interact with their blood pressure medication and 5.9% were concurrently using conventional pain medications and

Table 6 Discussion of care plan with arthritis patients

Care plan	All TCM* practitioners (n=52) n (%)	CHM/ACU practitioners (n=22) n (%)	Acupuncturists (n=30) n (%)	P value
Diet/nutrition				
No	2 (4.65)	0	2 (9.09)	0.488
Yes	41 (95.35)	21 (100.00)	20 (90.91)	
Smoking/drugs/alcohol				
No	5 (11.63)	1 (4.76)	4 (18.18)	0.345
Yes	38 (88.37)	20 (95.24)	18 (81.82)	
Physical activity/fitness				
No	1 (2.33)	0	1 (4.55)	1.000
Yes	42 (97.67)	21 (100.00)	21 (95.45)	
Ergonomic advice				
No	6 (13.95)	3 (14.29)	3 (13.64)	1.000
Yes	37 (86.05)	18 (85.71)	19 (86.36)	
Pain counselling				
No	4 (9.30)	2 (9.52)	2 (9.09)	1.000
Yes	39 (90.70)	19 (90.48)	20 (90.91)	
Nutritional supplements				
No	6 (14.29)	3 (14.29)	3 (14.29)	1.000
Yes	36 (85.71)	18 (85.71)	18 (85.71)	
Medications				
No	9 (20.93)	4 (19.05)	5 (22.73)	1.000
Yes	34 (79.07)	17 (80.95)	17 (77.27)	
Qigong/Tai Chi				
No	13 (30.23)	4 (19.05)	9 (40.91)	0.185
Yes	30 (69.77)	17 (80.95)	13 (59.09)	
Warming plaster/patches				
No	11 (25.58)	3 (14.29)	8 (36.36)	0.162
Yes	32 (74.42)	18 (85.71)	14 (63.64)	
Moxa				
No	10 (23.26)	4 (19.05)	6 (27.27)	0.721
Yes	33 (76.74)	17 (80.95)	16 (72.73)	

*TCM practitioners include CHM/ACU practitioners and acupuncturists.
ACU, acupuncture; CHM, Chinese herbal medicine; TCM, traditional Chinese medicine.

CAM that had potential polypharmacy issues.[37] As such, further research is required to explore arthritis patients' perceptions, expectations and experiences of their relationship with different healthcare providers in order to facilitate better coordinated care and treatment communication.

While most of the TCM practitioners in our study believed CHM was effective for treating RA and OA, less than half treated OA or RA primarily with CHM. The reason for this finding may be due to their acknowledgement of a lack of quality clinical studies regarding CHM effectiveness on arthritis.[38] Nevertheless, a previous study identified that CHM has been used by people with RA, as some verified effective ingredients of anti-rheumatic Chinese herbs have been found to inhibit RA development,[21] and further high quality clinical trials are necessary in order to substantiate the safety and efficacy of herbal medicines for arthritis. Moreover, the majority of TCM practitioners in our study believed that acupuncture was effective for reducing pain, which is supported by studies suggesting acupuncture may provide useful pain management for those who suffer from chronic pain.[21 39]

Our findings show that more acupuncturists and CHM/ACU practitioners perceived acupuncture as effective for reducing pain or swelling in arthritis than perceived CHM to be effective for reducing pain or swelling in arthritis. Participants who were both registered as an acupuncturist and a CHM practitioner appeared to believe in the role of acupuncture for relieving pain, which may relate to the fact that acupuncture has been reported as a routine clinical care option for arthritic patients with pain.[40 41] However, few studies have examined the effectiveness of acupuncture at reducing arthritis-related swelling. Also, more research is warranted to explore TCM practitioners' perceptions regarding the difference in

the relative effectiveness of CHM or acupuncture for arthritis management.

Our study also identified that more acupuncturists than CHM/ACU practitioners perceived acupuncture as effective for 'all arthritis'. In contrast, more CHM/ACU practitioners believed that CHM was effective for 'all arthritis' when compared with acupuncturists. These differences may possibly be explained via the training of the different practitioner types—acupuncturists who have not been trained with CHM knowledge may be more conservative when it comes to their belief in CHM as being effective in all types of arthritis. This finding suggests that acupuncturists may provide more acupuncture for people with arthritis while CHM/ACU practitioners may provide a combination of CHM and acupuncture. As such, it is suggested that more research on the perceptions, experiences and communications between different types of TCM practitioners is needed in order to guide more effective treatment plans and policies regarding arthritis patient management.

Limitations

Our findings may be limited due to several factors. The survey participants were recruited via PRACI, attracting a relatively small sample of TCM practitioners, and this needs to be considered when attempting to generalise our results to the broader practitioner population. Moreover, the survey data were collected by self-report which may introduce a degree of recall bias. Nevertheless, to our knowledge, this study provides the first examination of TCM practitioners' perceptions regarding TCM use among people with arthritis, thus helping to consider a number of issues that can be drawn on to advance TCM practice and knowledge.

CONCLUSION

The TCM profession represents an increasingly significant part of the Australian CAM practitioner sector and our study reveals a high level of interaction between TCM practitioners and other health practitioners in arthritis care. Moreover, the vast majority of TCM practitioners believe that CHM/acupuncture is effective for treating arthritis. Our study highlights the important need for more research in this area, in order to evaluate TCM provision and its role in providing effective, safe arthritis care.

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4.4 Chapter summary

The results from this chapter present a considerable number of TCM practitioners are using TCM to treat arthritis patients. Moreover, the findings reveal a high level of interaction between TCM practitioners and other healthcare practitioners in arthritis care in Australia. The majority of TCM practitioners believe that CHM/acupuncture is effective for treating arthritis. These findings showcase the current practice of TCM for arthritis care, and raise further questions on the use of healthcare choices such as the potential safety issues of concurrently using TCM and conventional medications; attitudes of people with arthritis (including women with arthritis) on the use of TCM; and where women with arthritis get information about TCM. A detailed examination of all the factors associated is needed, in order to help healthcare providers to provide safe and coordinated arthritis care.

CHAPTER 5 DISCUSSION

The discussion sections from each of the published manuscripts highlighted in earlier chapters have shown various discussion points. This chapter outlines the overall themes of this research in the broader context of TCM for arthritis care. Furthermore, based on the approach of HSR, the impact and significance of the findings from this research will be explored and identified with regard to a number of primary stakeholder groups – women with arthritis, healthcare professionals (including TCM practitioners and conventional professionals) and policy makers. The significance of the research findings, research implications, limitations and strengths of this research, as well as future research directions for TCM research on arthritis management is also outlined in this chapter.

5.1 Primary findings from the research

TCM has been promoted and integrated into primary healthcare by the World Health Organisation (WHO) since 1978 (WHO 2013). Research examining the use of TCM for arthritis has attracted increasing attention around the world (Section 2.1). The five key themes of the study presented in this thesis are: 1) women's use of TCM is associated with arthritis symptoms; 2) the prevalence of TCM use is considerable amongst women with arthritis; 3) the health status associated with arthritis may lead to the increased rate of TCM use amongst women with arthritis; and 4) lifestyle factors are associated with TCM use amongst women with arthritis; 5) referral patterns are associated with TCM use for women with arthritis. These themes are discussed in details below.

5.1.1 Women's use of TCM is associated with arthritis symptoms

As described in the Background Chapter (Section 1.4.2), TCM use is more common amongst women when compared with men, and the prevalence of women with arthritis is higher than that of men (Section 1.5.1). Specifically, it has been identified that TCM use amongst women is positively associated with arthritis (Section 4.1.2). The possible reasons for the use of TCM amongst women with arthritis include the emerging evidence of the effectiveness of TCM on arthritis, expectations of TCM use for arthritis, and women's experience of consultations from different healthcare providers.

5.1.1.1 Emerging evidence of the effectiveness of TCM use for arthritis

The positive associations between TCM use and women with arthritis have been shown in Chapter Four (Section 4.1.2). This may reflect a common awareness amongst arthritis sufferers that TCM has long been used for conditions such as arthritis and as well as an awareness that it may be useful in relieving arthritis symptoms (Cramer et al. 2015). Indeed, there are systematic reviews and clinical evidence showing that acupuncture is effective in OA and RA (Li et al. 2016; Zhang, Yue, et al. 2017). For example, meta-analyses have shown acupuncture may be beneficial for the symptoms of RA (Li et al. 2016; Zhang, Jiang & Lu 2011). Moreover, a recent systematic review overviewing 25 trials focused upon the effectiveness of acupuncture with other relevant physical treatments for relieving pain due to knee OA suggested that acupuncture can be considered as one effective treatment for short-term relief of pain (Corbett et al. 2013). Nevertheless, while there does appear to be a parallel between the use of TCM within our study and the support of literature

and clinical evidence for such use we do need to remain cautious of interpreting the relationship between these women's treatment choices and the more formal evidence-based literature available. It is not possible from the PhD data collected to tease out whether women with arthritis (such as those who have participated in the PhD research presented here) are themselves engaging with clinical literature directly or are accessing and assessing such evidence from a third party (practitioner, family member or community-based significant other) and more research is necessary to help investigate this topic in further depth.

CHMs have been studied for their anti-rheumatic effect on RA. For example, *GuiZhi-ShaoYao-ZhiMu* decoction has been used for the management of RA, has been systematically reviewed for its efficacy and has been suggested as one viable alternative to conventional medicine (Daily et al. 2017). This is in accordance with the findings reported from this thesis showing that TCM practitioners believe CHMs are effective for treating RA (Section 4.3.2). Besides, studies show that most patients with RA who used acupuncture are satisfied with their treatment and perceive acupuncture as effective (Hughes et al. 2007), which is in line with one of the results from this thesis, revealing that most of the arthritis sufferers who used TCM/CAM consider these medicines to be somewhat or very effective (Section 2.1.2).

5.1.1.2 Expectations of TCM use for arthritis

As the use of TCM is growing, previous research has shown women who use TCM may well have expectations due to TCM/CAM being reported for arthritis via non-professional sources such as the mass media (Ulusoy 2012) and encouragement from family members (Ulusoy 2012). This is broadly in line with a key finding from this

thesis, showing that TCM/CAM use amongst women with arthritis is partly motivated by their friends and family members (Section 2.1.2). Meanwhile, the expectation of using TCM for arthritis has also been shown to be supported by the approach and understanding of some TCM/CAM practitioners (Ramos-Remus et al. 1998) and has been more formally recommended by the American College of Rheumatology (Hochberg, Altman, Toupin, et al. 2012). Again, the extent to which such formal announcements and recommendations of support feed into the grass-roots decision-making of women with arthritis is debatable and further research is necessary to explore this and related issues around.

Moreover, pain control is the most common reason that people with arthritis choose to use TCM and other CAM modalities (Section 2.1.2), which is confirmed by the literature review findings, showing that people with arthritis who used TCM/CAM believe these treatments could potentially reduce pain levels (Cesar 2008; Hughes et al. 2007). Interestingly, it was demonstrated that the communication of optimism about the effect of acupuncture during the acupuncture consultation contributed to better pain relieve outcomes for patients and which in turn made patients feel more satisfied with acupuncture treatment (Street et al. 2012).

The negative experience of some using conventional medicine for the treatment of their arthritis is another reason why some women with arthritis may choose TCM (Fautrel et al. 2002). This finding is supported by a population study showing a majority of TCM/CAM users perceive conventional medicine as being unable to deliver effective relief of their OA symptoms (Obalum & Ogo 2011). Moreover, women suffer from significant adverse effects when using conventional medicine for

arthritis, such as gastrointestinal bleeding, renal dysfunction, and blood pressure elevation from taking NSAIDs (Sinusas 2012).

5.1.1.3 Women's experience of consultations from different healthcare providers

The study identifies Australian women with OA who consult acupuncturists as tending to have more visits to CAM practitioners than women with OA who do not use acupuncture (Section 4.2.2). This finding while not directly supported is similar to the finding of a previous population study conducted in Australia (Section 4.2.2), which showed GPs who previously prescribed TCM/CAM or used TCM/CAM themselves personally for their own health were more likely to refer their patients to an acupuncturist (Wardle, Sibbritt & Adams 2013a). Interestingly, arthritis patients in Mexico and Canada who visited TCM/CAM practitioners tend to visit TCM/CAM providers more frequently than GPs or rheumatologists (Cesar 2008; Sirois 2008). Moreover, CHM use amongst 10,287 Australian women has been shown to be positively associated with visits to a range of CAM practitioners (Sibbritt, Adams & Murthy 2013). However, more research is needed to establish and explore the referral patterns amongst different practitioners (including acupuncturists) for patients with arthritis, in order to ensure safer, more coordinated arthritis patient management.

5.1.2 The prevalence of TCM use is considerable amongst women with arthritis

Acupuncture is regarded as a non-toxic treatment with minimal adverse reactions compared to corticosteroids for RA, which is one of the reasons why acupuncture is very popular in the treatment of arthritis in many countries (WHO 2013). This is in line with findings from this thesis, suggesting the considerable use of TCM with 4.0-

9.5% of Australian women used acupuncture or CHM (Section 2.1.2) and 7.7% of women with OA use acupuncture (Section 4.1.2). The possible explanations for the reasons why women with arthritis use TCM have been shown in details below, including increasing prevalence of TCM/CAM use in combination with conventional medicine, motivations may attribute to the growing use of TCM for arthritis, and healthcare availability may drive the use of TCM for arthritis. However, the data from this PhD does not help identify which reason is the case, which warrants more research to find out.

5.1.2.1 Increasing prevalence of TCM/CAM use in combination with conventional medicine

One of the results of this research is the identification of high prevalence of concurrent use of multiple TCM/CAM types and conventional medicine amongst people with arthritis (Section 2.1.2). Firstly, the literature review of the TCM/CAM use for arthritis found that a large number of arthritis sufferers utilise TCM/CAM alongside conventional medicine (Section 2.1.2). This finding is in line with many other large population-based studies, revealing that most women with arthritis who use TCM/CAM together with their conventional medicine (Sleath et al. 2008; Yang et al. 2013). In addition, conventional care use has been shown to be positively related to greater TCM/CAM use which may reflect a desire of such patients to simply add-on additional treatments as opposed to substituting one treatment for another (Canizares et al. 2017). However, more research is needed to examine the benefits of using both TCM/CAM and conventional medicine for arthritis, in order to help

inter-professional care and communication where such coordinated practice may be possible for both treatment and health promotion (Canizares et al. 2017).

Furthermore, this study suggests women with arthritis who consult TCM/CAM practitioners are more likely to use acupuncture compared to those who do not consult TCM/CAM practitioners (Section 4.2.2). This finding can be partly explained by the fact that women with arthritis are reported to be more likely to try multiple types of TCM/CAM treatments (Hasan et al. 2009), and acupuncture is believed to be the most popular treatment in TCM/CAM for arthritis (Khan et al. 2016; Soeken 2004). Moreover, the advantages of using TCM in combination with conventional medicine has been shown for arthritis. For example, *Tripterygium wilfordii* – a CHM has been widely used to treat RA – has been the focus of a meta-analysis of 6 randomised controlled trials including a total of 643 patients. This work showed the combination of *Tripterygium wilfordii* and methotrexate (a synthetic disease-modifying anti-rheumatoid drug) may be a more effective and safer for treating RA compared to methotrexate alone (Wang et al. 2017). As such, more national longitudinal and cross-sectional research is needed to help confirm the popularity of and rich details around TCM use alongside conventional medicine for arthritis.

5.1.2.2 Motivations may attribute to the growing use of TCM for arthritis

The literature review outlined in Chapter Two identifies a range of factors as contributing to people's decision-making regarding the use of TCM/CAM for their arthritis management. These include disappointment with the efficacy of conventional medicine, and expectations of TCM/CAM for providing recovery, these reasons are consistent with other studies (Ben Natan, Perelman & Ben Naftali 2016;

Bishop & Lewith 2013; Khan et al. 2016; Vernooij & Marcelissen 2017). Specifically, people who used TCM/CAM were associated with more positive attitudes towards TCM/CAM (Ben Natan, Perelman & Ben Naftali 2016). In addition, it was shown that perceived helpfulness and safety of TCM/CAM for arthritis is related with increasing use of TCM/CAM (Cheung, Geisler & Sunneberg 2014; Sharpe et al. 2016). The previous cross-sectional study from the US indicated that 3.5% of 180 patients with arthritis who used TCM/CAM regarded acupuncture as helping their arthritis symptoms, and perceived help from TCM/CAM was one of the predictors for people with arthritis to use multiple types of TCM/CAM (Sharpe et al. 2016). This study is in line with other research from Germany suggesting patients who used acupuncture for OA are more likely to find acupuncture to be helpful with their OA symptoms (Cramer et al. 2015). However, further research is warranted to investigate the details (characteristics, associations, functional status) of the perceived benefits from different types of TCM treatments amongst women with arthritis.

It has been shown from this research that family, friends, and other relatives are the most important information sources guiding arthritis sufferers to use TCM/CAM (Section 2.1.2), which is in line with an earlier review focusing on TCM/CAM use for people with OA (Khan et al. 2016). This review suggested family and friends often influence OA patients' initial decision to use TCM/CAM as well as influencing their continuing use of these therapies (Khan et al. 2016). Moreover, a patient's family are also considered as a possible resource to promote the use of TCM/CAM, as the more positive views on the effect of TCM/CAM from their family, the more positive intentions people will have to use TCM/CAM (Ben Natan, Perelman & Ben Naftali

2016). However, there is an urgent need to examine the motivations around TCM use for arthritis (both initial and ongoing) both in a large population and in-depth. Such information will be especially useful for policy makers in ensuring sensitive, effective and safe arthritis management and practice guidelines.

5.1.2.3 Healthcare availability may drive the use of TCM for arthritis

The findings from the 45 and Up sub-study show that women with OA who use acupuncture are more likely to live in non-urban areas (Section 4.2.2), which is in accordance with a US study comprising 50 women with arthritis, concluding rural participants reported the greatest variety of TCM/CAM use (Cheung, Geisler & Sunneberg 2014). The reasons can be partly explained by the cost restrictions including travel expenses for rural women (Walkom, Loxton & Robertson 2013) and the lack of access to conventional health practitioners (Adams et al. 2011) which can both act as a barrier to conventional healthcare service use amongst those in non-urban areas. Specifically, a recent WHO report has identified that the most important reason for people to use TCM services is the potential cost-savings as TCM/CAM is less expensive than prescribed medications for people with arthritis (Obalum & Ogo 2011; WHO 2013), and the cost of consultations with TCM/CAM practitioners is higher in major cities compared to non-urban areas (Adams et al. 2011). Furthermore, acupuncture services, as well as other TCM/CAM treatments which are often more readily available in rural settings, may result in the higher prevalence of TCM use (Wardle, Lui & Adams 2012).

Previous research has indicated that health insurance for TCM rebates in Australia may have an impact on the use of TCM (Xue et al. 2008). The finding from the ALSWH

study reported in this PhD shows women who use TCM are more likely to have private insurance (Section 2.1.2), this may be partly explained by the fact that acupuncture services are covered by most Australian private health insurance, as well as government universal health insurance (Medicare) if the acupuncturist is also a medical doctor (Xue et al. 2008). Similarly, TCM/CAM users have been found to be more likely to have private insurance in the US (Nguyen et al. 2011). On the other side, research from the US has shown women who are uninsured are more likely to use TCM/CAM in an attempt to reduce their spend on prescription drugs (Wang, Kennedy & Wu 2015) as out-of-pocket costs have been growing for prescription medications in the US (Wang, Kennedy & Wu 2015). In addition, a 2-year follow-up study conducted in the UK evaluated that acupuncture as an alternative to knee surgery and its success in providing pain, stiffness and function improvements with estimated cost saving of GBP£ 100,000 a year (White et al. 2012). As such, it is important for future research to help to identify the experiences of women with arthritis across geographical areas regarding their TCM use, in order to provide insights to help guide TCM decision-making and use in different healthcare settings.

5.1.3 The health status associated with arthritis may lead to the increased rate of TCM use amongst women with arthritis

It has been suggested in previous work that people who use TCM/CAM are more likely to have chronic illnesses (Nguyen et al. 2011). Moreover, arthritis was rated the most common health condition that was treated by TCM/CAM (Cheung, Wyman & Halcon 2007) and people with arthritis have been found to be more likely to use TCM/CAM (Lee et al. 2004). Similarly, in this PhD study, women with arthritis are found to be more likely to use TCM compared to those women without arthritis

(Section 4.1.2). Moreover, the findings have shown that women with OA who use acupuncture are more likely to have longer duration of time since initial diagnosis of OA compared to non-acupuncture users (Section 4.2.2), which may be related to the benefits of acupuncture regarding the complication(s) of arthritis such as mental health problems and comorbidities associated with arthritis (Eshkevari 2017; Zhang, Yue, et al. 2017; Zhang, Chen, et al. 2010), and the relationship between arthritis status and wider choices of healthcare use such as TCM use (Tamhane et al. 2014). These relationships are discussed in detail below, including the association between arthritis status and TCM use, arthritis-associated mental health problems may lead to TCM use, and the association between comorbidities associated with arthritis and TCM use.

5.1.3.1 The association between arthritis status and TCM use

Amongst people with arthritis who regularly use TCM/CAM, trends have been seen for longer arthritis duration (Rao et al. 1999). The finding from this PhD research shows that women with OA who use acupuncture are more likely to have longer duration of OA compared to women with OA who do not use acupuncture (Section 4.2.2), which is in line with the results from a cross-sectional survey comprising 300 patients with rheumatic diseases, suggesting the prevalence of patients with rheumatic disease using TCM/CAM increased with time (Ramos-Remus et al. 1998). Moreover, people with RA with longer than two years were significantly more likely to use more TCM/CAM treatments than those with early disease (Tamhane et al. 2014). Similarly, people with RA who had symptoms of depression were more likely

to have a longer duration of RA, which results in more health services use such as TCM/CAM (Katz & Yelin 1993).

Interestingly, it is notable from a previous research conducted in India that the average duration of arthritis was six years amongst those who used TCM/CAM, while TCM/CAM non-users were five years (Jadhav et al. 2011). Moreover, a Mexican study examining the association between health outcomes and use of TCM/CAM amongst 249 patients with arthritis, suggested TCM/CAM users had longer arthritis duration than TCM/CAM non-users, with an average duration of eight years and six years of arthritis, respectively (Alvarez-Nemegyei, Bautista-Botello & Davila-Velazquez 2009). However, few other studies are focusing on the arthritis duration and patients' use of TCM and there is a need for more studies related to this issue, in order to guide healthcare providers in their attempts to provide better and wider treatment choices at the optimal time for arthritis patients.

5.1.3.2 Arthritis-associated mental health problems may lead to TCM use

Arthritis as a life event, people live with arthritis experience not only physical pain and disability, their mental health is also affected (Alishiri et al. 2008). Moreover, people with RA were significantly influenced on their mental health status and quality of life (Cadena et al. 2003; He et al. 2008). One of the findings in this thesis suggests that Australian women with OA who consult acupuncturists tend to have more visits to psychologists (Section 4.2.2) which is in accordance with the fact that acupuncture has been used to treat psychological problems (Pilkington 2010).

Anxiety disorders are significantly associated with arthritis, which will result in increased use of healthcare resources such as TCM/CAM (Katz & Yelin 1993; Zender & Olshansky 2009). Moreover, clinical trials have been conducted to examine the efficacy of acupuncture on mental health, not only for its physiological effect in improving local microcirculation but also for its effect on mental health in a way results in releasing endorphins (Pilkington 2010; Seca et al. 2016; Sniezek & Siddiqui 2013).

Interestingly, women with arthritis were more likely to experience bodily pain and physical problems (Alishiri et al. 2008) which maybe explain women with arthritis were more likely to experience depression than men (Needham & Hill 2010). Moreover, one of the findings from this thesis showed that women with arthritis were more likely to use TCM/CAM (Section 2.1.2), which can be explained by the relationship between liver depression and menstrual cycle from the TCM theory, women with arthritis who experience arthritis-associated depression may result in increased TCM treatment use (Zender & Olshansky 2009).

5.1.3.3 The association between comorbidities associated with arthritis and TCM use

In this thesis, most participating TCM practitioners perceive acupuncture to be effective in pain relief for patients with arthritis and this is in line with the fact that pain has been identified as one of the major predictors for regular use of TCM/CAM amongst patients with arthritis (Canizares & Badley 2016; Rao et al. 1999). However, there are few studies focusing on the associations between arthritis-associated pain and the use of TCM in a large population (Quandt et al. 2005). Further research is

warranted as the association between pain in arthritis and TCM use is significant for healthcare providers to instruct safe and effective care for patients with arthritis.

Furthermore, comorbidities are common amongst people with arthritis (CDCP 2018), which can be confirmed by the fact that the people with arthritis who used TCM/CAM were more likely to have other chronic illnesses, and coexistence of back or bowel disorders, cancer, sinusitis, or food allergies with arthritis was also related to TCM/CAM use (Fautrel et al. 2002). Moreover, people with RA who experience symptoms of depression have been shown to be more likely to have a longer duration of RA, more comorbidities, and utilise more health services such as TCM/CAM use (Katz & Yelin 1993; Quandt et al. 2005). It is important that future research help identify the underlying relationships between such comorbidities and arthritis status as comorbidities can complicate arthritis management and treatments (CDCP 2018). Such information will help healthcare practitioners in their attempts to understand arthritis in a broader context with a view to providing safe, effective and patient-sensitive care.

5.1.4 Lifestyle factors are associated with TCM use amongst women with arthritis

One of the findings identified from this thesis is that women who use TCM/CAM are more likely to have healthy lifestyles, compared to those with arthritis who did not use TCM/CAM (Section 4.1.2). This finding is in accordance with a survey study from Canada, which concluded that 170 people with arthritis who see themselves as having a healthy lifestyle is one of the predictors to use TCM/CAM (Sirois 2014). The possible reasons for women with arthritis who live in a healthy lifestyle tend to use TCM are discussed in details below, including health behaviour choices (smoking,

physical exercise, etc.) is associated with TCM use, and the relationship between promoting general health and the use of TCM.

5.1.4.1 Health behaviour is associated with TCM use

One of the findings from this PhD study shows that women with OA who report undertaking positive health behaviours such as partaking in physical activities are more likely to use acupuncture than those with OA who do not undertake physical activity (Section 4.2.2). This finding from the research is consistent with a previous cross-sectional study using data from the 2002 US NHIS, suggesting those who use TCM/CAM are more likely to have regular physical activities compared with those who had not used TCM/CAM (Nahin et al. 2007). Having more physical activity is reported to reduce pain, improve function, and reduce the risk of disability without increasing arthritis symptoms or arthritis progression (Hootman, Helmick & Brady 2012; Hootman & Helmick 2006), and TCM/CAM use alongside other treatments (medication, surgery, weight loss, etc.) are reported to be effective in the clinical arthritis management (Nahin et al. 2007). Moreover, studies have suggested physical activity may reduce the incidence of arthritis (Dunlop et al. 2014; Humphreys, McLeod & Ruseski 2014), as well as improve health benefits for people with arthritis (Eurenius & Stenström 2005; Hootman, Helmick & Brady 2012).

The finding from this research that women who are non-smokers or ex-smokers are more likely to use TCM/CAM compared with women who are current smokers (Section 2.1.2), which adds weight to the findings from a previous US national study, suggesting former smokers were more likely to use TCM/CAM, as former smokers who used TCM/CAM decided to quit smoking as part of a healthier lifestyle move

(Nahin et al. 2007). Moreover, another study from the US, comprising 855 participants, suggested that women with RA who used TCM/CAM were less likely to smoke compared to women with RA who did not use TCM/CAM (Tamhane et al. 2014), which is in accordance with a cross-sectional trial from Germany of 2,486 patients with chronic illnesses, showing current smokers were less likely to use acupuncture (Cramer et al. 2015). It is important to further examine and identify possible associations between a number of health behaviours (e.g. smoking, exercise, alcohol consumption) and TCM use in an attempt to provide insights on TCM use for arthritis and help improve coordinated arthritis care amongst healthcare providers and policy makers.

5.1.4.2 The relationship between promoting general health and the use of TCM

From the literature review undertaken and published from this research, it has been identified that most people (including women) with arthritis who use TCM/CAM report positive health benefits from their TCM/CAM (Section 2.1.2). This finding is in line with a population-based study suggesting 73.7% of 445 older adults who used TCM/CAM in order to maintaining general health, followed by 59.6% of these participants who used TCM/CAM to treat health conditions such as arthritis (n=104, 44%) (Cheung, Wyman & Halcon 2007). Furthermore, it was reported from a study using 2002 US NHIS data that people with arthritis who used any TCM/CAM modalities were more likely to have poor functional status, compared to people who used TCM/CAM without arthritis (Quandt et al. 2005). In addition, TCM/CAM users were more likely to rate their health to be better than the prior year amongst 8,487 participants who used TCM/CAM, compared to non-TCM/CAM users (Nguyen et al.

2011). As such, the role of TCM in patients with arthritis may not only act as a treatment for arthritis symptoms but may also possibly provide a means of promoting health. More research is needed to confirm the relationship between promoting general health and the use of TCM, in order to provide safe and effective information on the use of TCM for arthritis.

One of the findings from this research has suggested that people who visit TCM/CAM practitioners for their arthritis are more likely to visit TCM/CAM practitioners than GPs or rheumatologists (Section 4.2.2). This finding adds weight to the insights from a survey conducted in Canada, showing people with arthritis who perceived that they had a healthy lifestyle were more likely to consult TCM/CAM practitioners (Sirois 2014). These findings highlight the potential role of TCM/CAM practitioners in promoting positive health behaviours. Specifically, another survey study conducted in Canada suggested that most of 216 TCM/CAM users changed their health behaviours (improvement in diet, increased exercise, etc.) as a result of the encouragement or recommendation from TCM/CAM practitioner (Williams-Piehota et al. 2011). Moreover, TCM is regarded as a way of promoting health, whereas conventional medicine is often in this regard seen as having very little to contribute (Chung et al. 2014). As such, it is important to investigate the perceptions from TCM/CAM practitioners with regard to treatment for arthritis, and their relationships with conventional practitioners, in order to ensure coordinated and safe arthritis care plans.

5.1.5 Referral patterns are associated with TCM use amongst women with arthritis

The results of this thesis have identified an interesting finding that TCM practitioners report a relatively lower patients referral rate received by themselves from GPs, compared to the frequency of patient referrals initiated by them to GPs (Section 4.3.2). The possible reasons for the referral patterns of TCM use amongst arthritis women are discussed in detail below, including how referrals from other healthcare providers may influence women's choice of TCM, and how the relationship between TCM/CAM practitioners and conventional healthcare providers may influence TCM use.

5.1.5.1 Referrals from other healthcare providers may affect women's choice of TCM

The finding from this research has indicated a high level of referral relationships between TCM practitioners and a wide range of conventional, allied health and CAM practitioners (Section 4.3.2), which adds weight to a previous survey study comprising 456 GPs in rural and regional Australia, suggesting high level of interaction between acupuncturists and GPs (Wardle, Sibbritt & Adams 2013a). Moreover, a recent systematic review showed that personal belief, knowledge, and experience were all the reasons for health professionals to practice and study acupuncture alongside conventional medicines, as the benefits of incorporating acupuncture in conventional OA treatment were discovered (García-Escamilla, Rodríguez-Martín & Martínez-Vizcaíno 2016). This review is in line with previous survey research from 2013, which suggested GPs who had higher levels of self-reported knowledge of TCM, were more likely to engage in referrals to acupuncturists (Wardle, Sibbritt & Adams 2013a; Wardle, Sibbritt & Adams 2013b).

Specifically, the benefits of TCM as an additional treatment to conventional medicine for arthritis have been discussed in the previous Section (Section 1.6.3), with a high prevalence of TCM/CAM use concurrent to conventional treatments amongst patients with arthritis (Section 2.1.2).

One of the findings from the PRACI survey analysis undertaken in this thesis indicates that TCM practitioners (acupuncturists and CHM practitioners) in Australia receive their patients with arthritis mostly via informal referral from a range of practitioners including GPs, naturopaths, osteopaths and physiotherapists (Section 4.3.2). This finding is partly supported by a cross-sectional US study which explored acupuncture use amongst patients with chronic musculoskeletal pain and identified 55% of patients who used acupuncture had received a clinician referral and were significantly more likely to have pain due to arthritis, when compared to patients who used acupuncture via self-referral (Elder et al. 2015). However, research into the referral patterns amongst women with arthritis who use TCM is needed in order to identify the decision-making process and perceived benefits of these women, and provide in-depth referral guides to healthcare providers and policy makers to improve arthritis care.

5.1.5.2 The relationship between TCM/CAM practitioners and conventional healthcare providers may influence TCM use

This PhD research identifies that most of the TCM practitioners in Australia work with a massage therapist or a naturopath in the same practice, rather than a conventional practitioner (Section 4.3.2). This finding is in line with another result from this research, suggesting fewer referrals from GPs to TCM practitioners, compared to

referrals from TCM practitioners to GPs, regarding arthritis care (Section 4.3.2). Specifically, it was identified that GPs using TCM/CAM practitioners as the primary source of TCM/CAM, were more likely to refer their patients to consult an acupuncturist (Wardle, Sibbritt & Adams 2013a).

Interestingly, several previous studies have indicated that conventional practitioners are willing to learn more about TCM/CAM information, such as via fact sheets regarding specific CAM treatment for symptoms and results achieved (Jong et al. 2016), as they are looking for safe and effective treatment resources (Garcia-Escamilla, Rodriguez-Martin & Martinez-Vizcaino 2016). Although there is emerging evidence on the development of a closer working relationship between TCM/CAM practitioners and GPs (Cohen et al. 2005; Jong et al. 2016; Lim et al. 2017), TCM integration for treatment of arthritis remains under-developed. Specifically, a recent study suggested it was feasible to integrate TCM/CAM into a primary healthcare setting for chronic musculoskeletal treatment (including arthritis) although tests are needed for further implementation (Jong et al. 2016). As such, further detailed research focusing on the characteristics, decision-making of women with arthritis with experience from various healthcare providers (especially TCM practitioners) is required, to help understand referral practice regarding arthritis care and factors and reasons related to the differences between different health professionals (conventional practitioners and TCM/CAM practitioners).

5.2 Significance of the research findings

This research addresses a broad range of issues regarding CHM and acupuncture use for women with arthritis symptoms, particular women with OA, as well as perceptions from TCM practitioners regarding arthritis management.

The first primary finding discussed above is the emerging evidence of TCM/CAM use amongst people with arthritis. The critical review outlined in Chapter Two reveals extensive and frequent TCM/CAM use amongst patients with arthritis, who perceive such use to be beneficial. Potential use of TCM/CAM, often concurrent to conventional medical care, is certainly an issue with which all providers including rheumatologists need to be cognisant, and there is a need for further research in this area to help inform effective care and management for those with arthritis which is free from potential direct and indirect risks associated with TCM/CAM use.

The second primary finding from this thesis refers to the use of TCM which is associated with health status and healthy lifestyle choices amongst women with arthritis. The thesis has identified positive associations between women with arthritis and TCM use, such as women with a longer time of initial diagnosis of arthritis and women with arthritis who undertake regular physical activities, are more likely to use TCM for their arthritis. Healthcare practitioners treating women with arthritis need to be aware of the greater likelihood of TCM use by their patients to help advise women regarding efficacy and safety. There is a need for further research to examine the details, challenges and potential benefits of TCM use for women's health to aid the provision of safe and effective care.

The third primary finding identified from this thesis showed women aged 45 and older who use acupuncture for their OA are more likely to live in rural areas, suffer from longer duration of OA, undertake physical exercise and to visit a CAM practitioner (beyond an acupuncturist) and to visit a psychologist when compared with women who did not use acupuncture for their OA. Further research is required to explore these associations in detail and the potential implications of such findings for healthcare practitioners and policy makers.

The fourth primary finding from the thesis reveals a high level of interaction between TCM practitioners and other health practitioners in arthritis care. The TCM profession represents an increasingly significant part of the Australian CAM practitioner sector, and the vast majority of TCM practitioners believe that TCM is effective for treating arthritis. This finding highlights the critical need for more research in this area, in order to evaluate TCM provision and its role (both current and potential) in providing efficient, safe arthritis care.

Overall, this thesis contributes to the critical investigations of TCM for women with arthritis within a HSR approach. All the findings from the study not only address a number of gaps hitherto not investigated regarding TCM use for women with arthritis in Australia but also demonstrate significant implications around TCM use in arthritis care worldwide.

5.3 Implications of the research findings

The aim of this PhD research is to identify the characteristics and influential factors associated with women who used TCM for their arthritis, and the perceptions of TCM

practitioners on arthritis treatment in Australia, through a HSR approach. The findings from this thesis provide insights and highlight challenges of impact upon arthritis care providers, as well as policy makers. As such, this section explores the implications of the research findings presented for each related stakeholder.

5.3.1 Implications for women with arthritis

Women are more likely to suffer from arthritis compared with men, especially with increased age (Rodrigues et al. 2009). Arthritis is one of the major causes of disability and chronic pain which impacts on a patient's quality of life including varying degrees of discomfort and pain (Access Economics 2007).

The primary finding from this PhD research suggests that TCM/CAM higher usage in women compared to men and most of the women with arthritis use TCM/CAM alongside the use of conventional medications. This finding has significant health services implications for arthritis management. Specifically, for women with arthritis, it is essential to communicate with their healthcare providers about their TCM use, an issue of specific importance given that few people disclose their TCM use for arthritis as identified from previous literature (Geisler & Cheung 2015). Women with arthritis who communicate with healthcare providers about TCM use may receive clinical guidance regarding the concurrent use of both conventional medicine and CAM with a view to avoiding potential risks and receive a broader range treatment choices for their arthritis free from safety concerns. Such a scenario does depend upon the knowledge and confidence of the conventional provider with regard to TCM/CAM use, but this is an issue that can be addressed through improved communication and cooperation between the different providers over time.

Moreover, one of the findings from this research is that most women with arthritis receive information on TCM from their family, friends, and other relatives. Such non-professional information sources can open women up to potential risks and these women with arthritis need to seek appropriate advice from healthcare professionals. Meanwhile, although there are various information sources regarding TCM/CAM use and practices (Thomson et al. 2014), the information on safe and effective TCM choices for arthritis is still lacking. Reasons for non-closure of TCM/CAM use include patient concerns about the negative response from conventional practitioners, worries about conventional practitioners lacking TCM/CAM knowledge and conventional practitioner lacking TCM/CAM interest (Chapter 2) (Robinson & McGrail 2004). The All these issues highlight the importance of women with arthritis seeking (conventional medical and TCM) professional advice regarding treatment plans in order to ensure their use of TCM and other concurrent treatments are appropriate and safe. Improved communication between women with arthritis and their conventional provider also has the added benefit of potentially improving their relationship with their healthcare providers and increasing their satisfaction with their care more broadly (Robinson & McGrail 2004).

5.3.2 Implications for arthritis care providers

The findings from this research show women with arthritis who use TCM are also consulting other types of healthcare providers such as GPs, psychologists, and other CAM practitioners (Section 4.2.2). The PhD research also shows that the majority of those with arthritis who use TCM/CAM are not discussing such use with their conventional practitioners (Section 2.1.2). Moreover, nurses, clinicians, and other

CAM practitioners are identified in this thesis to have a critical role with regard to treatment choices in patients who use TCM for their arthritis (Section 1.6). As such, there exist significant practical implications for arthritis care providers, including conventional medical providers for arthritis and TCM/CAM providers for arthritis, regarding improving disclosure amongst patients and coordinating referral patterns between healthcare providers regarding arthritis care plans.

5.3.2.1 Implications for conventional medical providers for arthritis

Conventional medical providers for arthritis in Australia include GPs, rheumatologists, and nurses (Section 1.6.1). There are a considerable number of women who appear to use TCM for their arthritis, and conventional practitioners are the first healthcare professionals that people (including women) contact concerning their healthcare (including arthritis) (Robinson & McGrail 2004). As such, it is important for conventional medical providers to be aware of the details of TCM use, especially when it comes to concurrent use with conventional medicines. However, one of the findings from this research is that most women with arthritis who use TCM/CAM alongside conventional medicine fail to report their TCM (and wider CAM) use with their conventional care providers. There is a need to encourage and facilitate more communication between women with arthritis and conventional care providers in order to ensure safe and effective TCM use. Specifically, the communication skills of conventional care providers are positively related to patients' disclosure of their use of CAM (Zolnierek & DiMatteo 2009) and nurses and doctors have been identified as occupying a key role in patients' choices on TCM/CAM (Elder et al. 2015). Therefore, it is necessary for conventional care

providers to inquire about TCM use during their consultation with women with arthritis. Addressing this crucial issue will require, amongst other things, an increasingly open-minded approach on behalf of conventional providers not only to specifically broaching TCM use but also to acknowledging and investigating their patients' perspectives and needs as central to their arthritis care.

Moreover, it is noticeable from this research that women who use TCM for their OA are more likely to also consult a psychologist. This finding highlights both the importance of communication and interface between psychologists and other providers in the treatment plan of women with arthritis as well as the potential significance of mental health issues associated with living and coping with arthritis symptoms and pain. Importantly, conventional care providers need to be aware of their arthritis patients' mental health, in order to improve their patients' quality of life (He et al. 2008).

5.3.2.2 Implications for TCM/CAM providers for arthritis

One of the findings identified from this study is that while most TCM practitioners perceive CHM as effective for treating RA and OA, less than half treat OA or RA primarily with CHM, suggesting more knowledge regarding TCM for arthritis is needed, in order for these practitioners to provide an effective treatment plan.

Another finding identified in this thesis is that women with OA who use TCM are also more likely to use other CAM therapies which suggest multiple types of TCM/CAM treatments use amongst women with arthritis. This finding highlights a need for close communication amongst the vast range of practitioners in the CAM field in order to

ensure women's arthritis care management is effectively coordinated. Just as the conventional-CAM interface highlights dangers around patient safety and potential pitfalls regarding sub-optimal provider communication, the interface between different CAM providers (including TCM practitioners) also has the potential to negatively impact overall patient care if neglected or under-appreciated. TCM/CAM arthritis care providers should seek rich information from their patients regarding all concurrent provider use, and it is essential they communicate with other CAM practitioners providing arthritis care wherever possible.

5.3.3 Implications for policy makers

There are implications from this study for policy makers. This PhD research reveals considerable TCM use amongst Australian women with arthritis, and a high prevalence of TCM/CAM use concurrent to conventional medicine use for arthritis symptoms. Although there are benefits for using TCM in combination with conventional medicine for arthritis (Chen et al. 2015; Liu et al. 2017), studies have shown that there exist potential harmful reactions or adverse effects from using TCM and conventional medicine. For example, *St John's wort* (one of CHM, *Guan Ye Lian Qiao*) can interact with narcotic pain medications (Marsh et al. 2009). Moreover, a lack of medication safety information was rated one of the greatest concerns amongst women with RA (Ackerman et al. 2015). As such, it is important for policy makers to have formal guidelines with regard to the potential effect on TCM individually or concurrently alongside conventional medicine for arthritis. Meanwhile, the study identifies a high level of referral relationships between TCM practitioners and conventional practitioners and a number of arthritis care guidelines

and recommendations may be considered by policy makers to ensure safe, effective, and coordinated care for women with arthritis.

Although the TCM profession in Australian is established and has been regulated by AHPRA (Section 1.4.3) under the Health Practitioner Regulation National Law since 2012, there is more work (e.g. regulation, treatment information) to be done in relation to its practice and practitioners in arthritis management (Section 4.3). Moreover, as the prevalence of arthritis in Australian is fast growing (Access Economics 2007) and the use of TCM for arthritis has attracted increasing attention, the development of healthcare policies around arthritis need to also reflect these grass-roots realities and consider the contribution, challenges and potential of TCM use in the wider policy development around arthritis care (Moore et al. 2016).

5.4 Limitations of the research

This thesis has drawn upon three large Australian nationally representative samples (relating to both women users and TCM practitioners), in order to investigate the use of TCM in women with arthritis and the approach of TCM practitioners regarding arthritis patient care. Limitations of this research are acknowledged and identified in this section.

5.4.1 Definition of traditional Chinese medicine

The research utilising ALSWH in this thesis was limited to only CHM/acupuncture use rather than all the components of TCM which including CHM, acupuncture, moxa, Tai Chi, Chinese therapeutic massage (Tui Na). While moxa, Tai Chi and Chinese therapeutic massage (Tui Na) have been used for arthritis with positive results

(Callahan et al. 2016; Sun et al. 2014; Yang, Zhang & Zhang 2014). It is likely this limitation may have led to a conservative estimation of TCM use amongst these women. However, this limitation arises from the fact that this PhD study was derived from a large, nationally representative sample, which was not primarily designed to determine TCM use. As a consequence, further research should examine the use of a wider pool of TCM treatments amongst those with arthritis to help move towards a comprehensive and richer understanding of all treatment possibilities relating to TCM and arthritis care.

5.4.2 Selection bias

The age of women from the selected surveys (survey 6 of the ALSWH 'young' cohort, survey 7 of the ALSWH 'middle-aged' cohort, and the 45 and Up Study sub-study) may result in limitations regarding sample selection. For example the young and middle-aged cohort of women in the ALSWH study were aged 34-49 years and 62-67 years when they completed the surveys, respectively. However, women from the 45 and Up Study sub-study were aged over 45. It is known that women with arthritis are within a wider age range, with RA normally experienced from ages 29 to 78 (Costenbader et al. 2007). As such, generalising the study results to all Australian women with arthritis needs to be considered with caution. Similarly, findings from the PRACI survey study were analysed from participants recruited via PRACI, which has a relatively small sample of TCM practitioners. Caution should be taken in any attempt to generalise these results to the broader TCM practitioner population. Nevertheless, results shown from the thesis draw upon large, national samples to provide the first large-scale analyses of TCM use amongst women with arthritis and

the approach and experiences of TCM practitioners regarding arthritis care constituting a solid platform for the further in-depth study on these issues.

5.4.3 Recall bias

This research relies on self-reported data from ALSWH, the 45 and Up Study sub-study, and PRACI which may subject to recall bias. Women with arthritis were asked questions regarding their use of CHM, and acupuncture over the previous 12 months, which may lead to recall bias, and affect the accuracy of the findings. Moreover, the interpretation of the PhD study findings is also limited by the reliance upon the self-reported information, which may reflect a degree of recall bias. TCM practitioners were questioned regarding their demographic characteristics, practice characteristics, and clinical management on arthritis, which may also lead to a degree of recall bias and affect the accuracy of the findings.

5.4.4 Questionnaire design

The ALSWH survey questionnaires drawn upon in this thesis were designed with the aim of examining a broad range of women's health behaviour and were not designed specifically to investigate TCM use for arthritis. As such, measures of the radiological score and functional status which could have measured arthritis characteristics were not available via the ALSWH dataset. Further, the thesis findings from PRACI were drawn from fieldwork with a relatively small sample of TCM practitioners via *SurveyGizmo* and needed to be considered cautiously when generalising to broader practitioner population. Moreover, the 45 and Up sub-study utilised in this thesis was only designed for examining issues around OA in women, and we must be mindful of this feature when considering the generalisability of this work to the broader field of

arthritis care. Nevertheless, these limitations are countered by the first-ever opportunity to analyse key issues around TCM use and practice for arthritis from established, prestigious datasets.

5.5 Strengths of the research

This research represents investigation drawing upon three large-scale population and practitioner studies, the ALSWH study, the 45 and Up Study and the PRACI practice-based research network project. The ALSWH study has been following over 40,000 nationally representative sample of women since 1996 and is documenting a wide range of their healthcare behaviours and utilisation; covering a wide range of CAM use including TCM. As discussed in the Background section, this thesis draws upon data from ALSWH survey 6 in 2012 involving 8,010 participants aged 34-39 years old, and survey 7 in 2013 involving 9,151 participants aged 62-67 years old, which can be used to explore the characteristics of women using TCM from first large-scale, nationally representative sample.

This thesis includes the first study exclusively focusing upon TCM use in arthritis (OA) amongst Australian women aged over 45 years old via a sub-study from the 45 and Up Study. The 45 and Up Study is a large-scale Australian cohort study collecting data on over 266,000 individuals aged 45 years and over, providing a wide range of public health information over time. The 45 and Up Study sub-study research from this thesis was based on information gathered from 800 women from the baseline dataset who indicated they had been diagnosed with OA. Access to this dataset allowed the first opportunity to analyse issues relating to the use of acupuncture amongst women with OA from an established and extensive dataset.

PRACI is the first ever CAM PBRN in the world to focus upon different CAM modalities (including TCM practitioners), and the largest national PBRN for CAM practitioners in the world. Drawing upon this established dataset to recruit and conduct a sub-study this thesis provides the first examination of the perceptions of TCM practitioners in Australia regarding treatment and practice approach regarding arthritis.

5.6 Future research directions for TCM use in arthritis

This thesis presents insights relating to a variety of issues that require further research attention in the area of TCM use and practice for those with arthritis. A number of areas of research building upon the analyses and findings from this study and pertinent for future investigation are outlined below.

5.6.1 Health services research

As demonstrated in Chapter One, there is a need to expand the TCM-focused research gaze beyond RCTs to also promote complementary HSR methods, perspectives, and designs. This thesis provides the first cross-sectional analysis of TCM use amongst women with arthritis from large nationally representative samples, to understand the role of TCM in women with arthritis in Australia. However, more details around women with arthritis and their use of TCM are required. As shown in this thesis, having doctor-diagnosed arthritis was one of the predictors for women choosing to use TCM. This area warrants further attention to explore such topics as: the reasons why women with arthritis decide to use TCM from amidst wide range of healthcare options; the information sources, decision-making, perceived benefits from women with arthritis; and the relationships between women with arthritis and

healthcare providers (including TCM/CAM practitioners and conventional practitioners).

Given the considerable prevalence of women's use of TCM for their arthritis as identified from this thesis, it is important to explore further details and issues relating to such use including examination of the detailed decision-making around TCM use for individual symptoms and a comparison of different TCM methods for such symptom management. There is a need for future investigation to better understand the complexities and nuances of TCM use and the drivers of TCM use from the woman's perspective. How is TCM use related to, reflected in and mediated by the varied social, cultural, political and economic circumstances of individual women within the context of their broader lives and communities? Such future investigation would benefit greatly from longitudinal, large-scale project design, as well as qualitative, in-depth approaches and such HSR-focused enquiry would benefit all stakeholders, and managing services in their efforts towards realising optimal arthritis care and patient management.

Another fruitful area for future HSR on TCM for arthritis is to explore in-depth TCM practitioners' attitudes towards their own practice on this topic and their reflections and evaluations of women's TCM use for their arthritis. The findings of this thesis reveal that a potentially substantial number of TCM practitioners perceive TCM as an effective treatment choice for arthritis. More research is warranted to find out why they are confident in the efficacy of TCM on arthritis and to explore the extent to which confidence and perspective are communicated and shared with patients in consultations. While TCM originated in China and is a healthcare profession in which

the skills and knowledge of practitioner play an essential role in the therapeutic effect of the treatment provided. As such, the educational background (e.g. the country they studied in and the highest level of TCM qualification) of Australian TCM practitioners who participated in our study may have impacted the results presented in this thesis. Further research is warranted to find out whether the educational background of TCM practitioners in Australia is influential upon their clinical practice. Moreover, there is also a need to explore the referral patterns between TCM practitioners, other CAM practitioners, and conventional medical practitioners, in order to identify patterns of TCM use for women with arthritis over time. It will be interesting and important for future research to examine if women's TCM use changes over the course of their journey with arthritis – do they adapt, refine, withdraw or expand their TCM treatment at different periods and through different episodes of living and coping with their arthritis? And how does such possible fluctuations or constants of TCM use relate to women's broader healthcare utilisation. For example, are other non-TCM treatments adopted as TCM is relinquished and how does use of non-TCM treatments (both CAM and conventional) vary as TCM use is adopted. Analysing these and similar issues provide insights of benefit to both women suffering from arthritis and the range of providers who contribute to their care.

Finally, the communication between women with arthritis who use TCM and their conventional health and CAM practitioners is a topic worthy of further investigation. The critical literature review in this thesis (Chapter 2) shows over 50% of people with arthritis fail to disclose TCM/CAM use to their healthcare providers. Future HSR

needs to focus on explaining why women with arthritis disclose or fail to disclose their TCM use to their conventional healthcare providers. Such future investigation can focus upon qualitative fieldwork both questioning providers and patients around their communication as well as non-participatory observations of the style and content of interaction and communication between practitioners and patients in grass-roots daily routine care.

5.6.2 Clinical research

In addition to further HSR on this topic, future investigation is also needed to help strengthen the clinical evidence base around TCM for arthritis (Adams, Sommers & Robinson 2013). There is currently limited clinical evidence with direct reference to managing arthritis, and although TCM has been suggested as useful for relieving arthritis symptoms, previous clinical trials relating to TCM and arthritis have been predominantly of poor methodological quality (Section 1.6.3). As discussed in this thesis, TCM practitioners hold a range of perceptions regarding the efficacy of different TCM treatments (CHM, acupuncture) for treating arthritis and it is essential more research investigating not only practitioner experiences but also the clinical efficacy of this range of TCM treatments in relation to arthritis be undertaken.

5.7 Chapter summary

Chapter 5 outlines a number of primary areas for future research (both focused upon health services and clinical issues) with a view to examining TCM use amongst women with arthritis and the practices and experiences of TCM practitioner in relation to treating arthritis. The chapter highlights how the complex range of providers available for treating women with arthritis and the lack of communication

about TCM use to conventional health practitioners (amongst other issues) help identify the communication and information sharing activities across patients and practitioners as one priority area for future research on this significant healthcare topic. The study limitations, strengths and implications for a range of pertinent stakeholders have also been identified.

CHAPTER 6 CONCLUSION

This thesis examines women's use of TCM for their arthritis and the practice of TCM practitioners regarding arthritis via a HSR approach. A number of significant findings have been identified.

First, the literature review identifies a high prevalence of patients (including women) with arthritis use TCM/CAM either alone or more commonly alongside conventional medication. Meanwhile, only half of these TCM/CAM users inform their conventional practitioners about such use. Moreover, a large proportion of those with arthritis consider TCM/CAM to be effective in alleviating arthritis symptoms, controlling related pain and improving their quality of life.

Second, the secondary data analysis from the ALSWH study reveals considerable TCM use amongst Australian women, and shows women with arthritis are more likely to use TCM compared to women who do not report having arthritis. Moreover, women with arthritis who use TCM are more likely to exercise regularly, to be non-smokers or ex-smokers and to have more visits to specialist health professionals when compared to women who do not use TCM.

Third, the results from the 45 and Up Study sub-study indicate a considerable number of women with OA use acupuncture for their OA. The predictors of acupuncture use amongst women with OA are: experiencing a longer duration of OA; living in a non-urban area; undertaking more exercise; having consulted a psychologist; and having consulted another CAM practitioners.

Finally, the PRACI survey results report that most of the TCM practitioners work with other health professionals in their practice location and are aware of their patients with arthritis using TCM alongside other treatments (conventional medications or other treatments from CAM), and believe TCM to be effective for treating arthritis. Moreover, TCM practitioners in this PhD study report a high level of referral activity with a wide range of conventional, allied health and CAM practitioners.

This thesis has not only elucidated key research findings shown above but also identified implications for all stakeholders related to TCM use for arthritis, as well as raised future research directions on how to develop these findings. This research is the first study focusing on TCM use for arthritis in women which unveiled many characteristics, associations, and prevalence rates from a HSR approach. Moreover, this research provides the first in-depth arthritis-focused examination of Australian registered TCM practitioners. The opportunities to use data from two large national samples (ALSWH and PRACI) and one large State-wide sample (the 45 and Up Study) to examine use and practice of TCM for arthritis have provided insights for future research and of implication to those providing, receiving and organising arthritis care in Australia.

APPENDICES

Appendix 1 Australian Longitudinal Study on Women's Health seventh survey of the middle-aged cohort women (Survey 7)

How to complete this survey

This is the seventh 'main' survey for women in your age group. As the purpose of the project is to look at changes over time, some of the questions are the same as those in previous surveys.

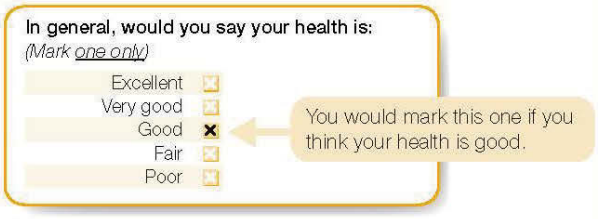
Please answer every question you can. If you are unsure about how to answer a question, mark the *response for the closest answer to how you feel.*

Please write any comments or important information on page 34.
We are not able to *read comments written elsewhere throughout the survey.*

Please read the instructions above each question carefully. Some require you to only answer those *options which are applicable to you. Other questions require you to mark one answer on each line. The questions may also refer to different time periods.*

INSTRUCTIONS ▪ Use a black or blue biro ▪ Do not fold or bend this survey

▪ **Cross the boxes like this:**



▪ **Print clearly in the boxes like this:**

▪ **Correct mistakes like this:**

If you need help to answer any questions, please ring 1800 068 081 (This is a FREECALL number)

- If you are concerned about any of your health experiences and would like some help, you may like to contact:
  - your nearest Women's Health Centre or Community Health Centre
  - your General Practitioner for advice about who would be the best person in your community for you to talk to.
- If you feel distressed now and would like to talk to someone, you could ring Lifeline on 131 114 (local call).

Note: No commercial gain or sponsorship is provided to ALSWH for the inclusion of brand names in the survey.

The questions on the first page ask only about NOW - how your health is NOW and about how your health limits certain activities NOW.

Q1 In general, would you say your health is: *(Mark one only)*

- ☒ Excellent
- ☒ Very good
- ☒ Good
- ☒ Fair
- ☒ Poor

Q2 Compared to one year ago, how would you rate your health in general now? *(Mark one only)*

- ☒ Much better now than one year ago
- ☒ Somewhat better now than one year ago
- ☒ About the same as one year ago
- ☒ Somewhat worse now than one year ago
- ☒ Much worse now than one year ago

Q3 The following questions are about activities you might do during a typical day. Does YOUR HEALTH NOW LIMIT YOU in these activities? If so, how much?
(Mark one on each line)

		Yes, limited a lot	Yes, limited a little	No, not limited at all
a	VIGOROUS activities such as running, lifting heavy objects, participating in strenuous sports	☒	☒	☒
b	MODERATE activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf	☒	☒	☒
c	Lifting or carrying groceries	☒	☒	☒
d	Climbing SEVERAL flights of stairs	☒	☒	☒
e	Climbing ONE flight of stairs	☒	☒	☒
f	Bending, kneeling or stooping	☒	☒	☒
g	Walking MORE THAN ONE kilometre	☒	☒	☒
h	Walking HALF a kilometre	☒	☒	☒
i	Walking 100 metres	☒	☒	☒
j	Bathing or dressing yourself	☒	☒	☒

The next seven questions ask about your health IN THE LAST FOUR WEEKS.

Q4 During the PAST FOUR WEEKS, have you had any of the following problems with your work *(including your work outside the home and housework)* or other regular daily activities AS A RESULT OF YOUR PHYSICAL HEALTH? *(Mark one on each line)*

		Yes	No
a	Cut down on the amount of time you spent on work or other activities	☒	☒
b	Accomplished less than you would like	☒	☒
c	Were limited in the kind of work or other activities	☒	☒
d	Had difficulty performing the work or other activities *(eg it took extra effort)*	☒	☒

Q5 During the PAST FOUR WEEKS, have you had any of the following problems with your work or other regular daily activities AS A RESULT OF ANY EMOTIONAL PROBLEMS *(such as feeling depressed or anxious)*? *(Mark one on each line)*

		Yes	No
a	Cut down on the amount of time you spent on work or other activities	☒	☒
b	Accomplished less than you would like	☒	☒
c	Didn't do work or other activities as carefully as usual	☒	☒

Q6 During the PAST FOUR WEEKS, to what extent have your PHYSICAL HEALTH OR EMOTIONAL PROBLEMS interfered with your normal social activities with family, friends, neighbours or groups? *(Mark one only)*

- Not at all ☒
- Slightly ☒
- Moderately ☒
- Quite a bit ☒
- Extremely ☒

Q7 How much BODILY pain have you had during the PAST FOUR WEEKS? *(Mark one only)*

- No bodily pain ☒
- Very mild ☒
- Mild ☒
- Moderate ☒
- Severe ☒
- Very severe ☒

Q8 During the PAST FOUR WEEKS, how much did PAIN interfere with your normal work *(including work outside the home and housework)*? *(Mark one only)*

- Not at all ☒
- A little bit ☒
- Moderately ☒
- Quite a bit ☒
- Extremely ☒

Q9 For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the PAST FOUR WEEKS:
(Mark one on each line)

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
a	Did you feel full of life?	☒	☒	☒	☒	☒	☒
b	Have you been a very nervous person?	☒	☒	☒	☒	☒	☒
c	Have you felt so down in the dumps that nothing could cheer you up?	☒	☒	☒	☒	☒	☒
d	Have you felt calm and peaceful?	☒	☒	☒	☒	☒	☒
e	Did you have a lot of energy?	☒	☒	☒	☒	☒	☒
f	Have you felt down?	☒	☒	☒	☒	☒	☒
g	Did you feel worn out?	☒	☒	☒	☒	☒	☒
h	Have you been a happy person?	☒	☒	☒	☒	☒	☒
i	Did you feel tired?	☒	☒	☒	☒	☒	☒

Q10 During the PAST FOUR WEEKS, how much of the time have your PHYSICAL HEALTH OR EMOTIONAL PROBLEMS interfered with your social activities ***(like visiting friends, relatives, etc)***? *(Mark one only)*

- All of the time ☒
- Most of the time ☒
- Some of the time ☒
- A little of the time ☒
- None of the time ☒

Q11 How TRUE or FALSE is EACH of the following statements for you? *(Mark one on each line)*

		Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a	I seem to get sick a little easier than other people	☒	☒	☒	☒	☒
b	I am as healthy as anybody I know	☒	☒	☒	☒	☒
c	I expect my health to get worse	☒	☒	☒	☒	☒
d	My health is excellent	☒	☒	☒	☒	☒

Q12 How many times have you consulted the following people for YOUR OWN HEALTH in the LAST TWELVE MONTHS? *(Mark one on each line)*

		None	Once or twice	3 or 4 times	5 or 6 times	7-12 times	13-24 times	25 or more times
a	A family doctor or another General Practitioner (GP)	☒	☒	☒	☒	☒	☒	☒
b	A hospital doctor *(eg in outpatients or casualty)*	☒	☒	☒	☒	☒	☒	☒
c	A specialist doctor	☒	☒	☒	☒	☒	☒	☒

Q13 Have you consulted the following people for YOUR OWN HEALTH in the LAST TWELVE MONTHS? *(Mark one on each line)*

		Yes	No
a	Physiotherapist	☒	☒
b	Counsellor / Psychologist / Social worker	☒	☒
c	A community nurse, practice nurse, or nurse practitioner	☒	☒
d	Optician / Optometrist	☒	☒
e	Hearing specialist	☒	☒
f	Dietitian	☒	☒
g	Podiatrist	☒	☒
h	Dentist	☒	☒
i	Massage therapist	☒	☒
j	Naturopath / Herbalist	☒	☒
k	Chiropractor	☒	☒
l	Osteopath	☒	☒
m	Acupuncturist	☒	☒
n	Other alternative health practitioner *(eg aromatherapist, homeopath, reflexologist, iridologist)*	☒	☒

Q14 How often have you used the following therapies for YOUR OWN HEALTH in the LAST TWELVE MONTHS? *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
a	Vitamins / Minerals	☒	☒	☒	☒
b	Yoga or meditation	☒	☒	☒	☒
c	Herbal medicines	☒	☒	☒	☒
d	Aromatherapy oils	☒	☒	☒	☒
e	Chinese medicines	☒	☒	☒	☒
f	Other alternative therapies	☒	☒	☒	☒

Q15 When you go to a General Practitioner: *(Mark one on each line)*

		Always	Most of the time	Sometimes	Rarely or never
a	Do you go to the same place?	☒	☒	☒	☒
b	Do you usually see the same doctor?	☒	☒	☒	☒

Q16 How would you rate the cost to you of your LAST visit to a General Practitioner? *(Mark one only)*

- No cost to me ☒
- Good ☒
- Fair ☒
- Poor ☒
- Don't know ☒

Q17 Have you been admitted to hospital in the LAST TWELVE MONTHS? *(Mark one only)*

- ☒ No
- ☒ Yes, day only
- ☒ Yes, spent at least one night

Q18 **Do you have a Health Care Card?** This is a card that entitles you to discounts and assistance with medical expenses. This is not the same as a Medicare card. *(Mark one only)*

- ☒ Yes
- ☒ No

Q19a Do you have private health insurance for HOSPITAL COVER? *(Mark one only)*

- ☒ Yes
- ☒ No – I am covered by Veterans' Affairs
- ☒ No – because I can't afford the cost
- ☒ No – because I don't think you get value for money
- ☒ No – because I don't think I need it
- ☒ No – other reason

Q19b Do you have private health insurance for ANCILLARY services (eg dental, physiotherapy)? *(Mark one only)*

- ☒ Yes
- ☒ No – I am covered by Veterans' Affairs
- ☒ No – because I can't afford the cost
- ☒ No – because I don't think you get value for money
- ☒ No – because I don't think I need it
- ☒ No - because the services are not available where I live
- ☒ No – other reason

Q20 When did you last have: *(Mark one on each line)*

		In the last 2 years	2-5 years ago	More than 5 years ago	Never	Don't know
a	A Pap test?	☒	☒	☒	☒	☒
b	A mammogram?	☒	☒	☒	☒	☒

Q21 In the PAST THREE YEARS have you had an abnormal result from: *(Mark one on each line)*

		Yes	No	Don't know
a	A Pap test?	☒	☒	☒
b	A mammogram?	☒	☒	☒

Q22 In the PAST THREE YEARS, have you: *(Mark all that apply on each line)*

		Doctor	Nurse	Other	Not checked
a	Had your blood pressure checked?	☒	☒	☒	☒
b	Had your cholesterol checked?	☒	☒	☒	☒
c	Had your blood sugar level checked?	☒	☒	☒	☒
d	Had your skin checked *(eg spots, lesions, moles)*?	☒	☒	☒	☒

Q23 In the PAST THREE YEARS, have you: *(Mark one on each line)*

		Yes	No
a	Had your breasts examined by a doctor or nurse?	☒	☒
b	Carried out *regular monthly* breast self examination?	☒	☒
c	Had a bone density test?	☒	☒
d	Had a test for bowel cancer?	☒	☒
e	Been vaccinated for influenza *(the 'flu')*?	☒	☒
f	Had a pneumococcal vaccine *(also called PPV, for pneumonia)*?	☒	☒

Q24 Are you CURRENTLY taking Hormone Replacement Therapy (HRT)?

Yes ☒
No ☒

Q25 Do you regularly NEED help with daily tasks because of long-term illness, disability or frailty *(eg personal care, getting around, preparing meals etc)*? *(Mark one only)*

Yes ☒
No ☒

Q26 In the past month: *(Mark one on each line)*

		Yes	No
a	Have you felt keyed up or on edge?	☒	☒
b	Have you been worrying a lot?	☒	☒
c	Have you been irritable?	☒	☒
d	Have you had difficulty relaxing?	☒	☒
e	Have you been sleeping poorly?	☒	☒
f	Have you had headaches or neck aches?	☒	☒
g	Have you had any of the following: trembling, tingling, dizzy spells, sweating, diarrhoea or needing to pass urine more often than normal?	☒	☒
h	Have you been worried about your health?	☒	☒
i	Have you had difficulty falling asleep?	☒	☒

Q27 Thinking about your own health care, how would you rate the following?
(Mark one on each line)

		Excellent	Very good	Good	Fair	Poor	Don't know
a	Access to medical specialists if you need them	☒	☒	☒	☒	☒	☒
b	Access to a hospital if you need it	☒	☒	☒	☒	☒	☒
c	Access to medical care in an emergency	☒	☒	☒	☒	☒	☒
d	Access to after-hours medical care	☒	☒	☒	☒	☒	☒
e	Access to a GP who bulk bills	☒	☒	☒	☒	☒	☒
f	Access to a female GP	☒	☒	☒	☒	☒	☒
g	Hours when a GP is available	☒	☒	☒	☒	☒	☒
h	Number of GPs you have to choose from	☒	☒	☒	☒	☒	☒
i	Ease of seeing the GP of your choice	☒	☒	☒	☒	☒	☒
j	How long you wait to get a GP appointment	☒	☒	☒	☒	☒	☒
k	The outcomes of your medical care *(how much you are helped)*	☒	☒	☒	☒	☒	☒
l	Ease of obtaining a mammogram	☒	☒	☒	☒	☒	☒
m	Ease of obtaining a Pap test	☒	☒	☒	☒	☒	☒
n	Access to a counselling service if you need it	☒	☒	☒	☒	☒	☒

Q28 In the LAST TWELVE MONTHS have you: *(Mark all that apply)*

		Yes
a	Slipped, tripped or stumbled?	☒
b	Had a fall to the ground?	☒
c	Been injured as a result of a fall?	☒
d	Needed to seek medical attention for an injury from a fall?	☒
e	Had any other injury from an accident at your home?	☒
f	Broken or fractured any bone/s?	☒
g	None of the above	☒

Q29 In the PAST WEEK, have you been feeling that life isn't worth living? *(Mark one only)*

Yes ☒
No ☒

Q30 In the PAST 6 MONTHS, have you EVER deliberately hurt yourself or done anything that you knew might have harmed or even killed you? *(Mark one only)*

Yes ☒
No ☒

If you answered YES to either of the last 2 questions, you might like to talk to someone about how you are feeling. You could ring Lifeline on 13 11 14 (local call).

Q31 Do you have any of these sleeping problems? *(Mark all that apply)*

		Yes
a	Waking up in the early hours of the morning	☒
b	Lying awake for most of the night	☒
c	Taking a long time to get to sleep	☒
d	Worry keeping you awake at night	☒
e	Sleeping badly at night	☒
f	None of these problems	☒

Q32 In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
a	Diabetes *(high blood sugar)*	☒
b	Impaired glucose tolerance	☒
c	None of these conditions	☒

In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
d	Osteoarthritis	☒
e	Rheumatoid arthritis	☒
f	Other arthritis	☒
g	Osteoporosis	☒
h	None of these conditions	☒

In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
i	Heart disease *(including heart attack, angina)*	☒
j	Thrombosis *(a blood clot)*	☒
k	Hypertension *(high blood pressure)*	☒
l	Stroke	☒
m	None of these conditions	☒

In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
n	Parkinson's disease	☒
o	Mild Cognitive Impairment (MCI)	☒
p	Alzheimer's disease or dementia	☒
q	None of these conditions	☒

Q32 continued...

In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
r	Low iron level *(iron deficiency or anaemia)*	☒
s	Asthma	☒
t	Bronchitis / emphysema	☒
u	None of these conditions	☒

In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
v	Breast cancer	☒
w	Cervical cancer	☒
x	Lung cancer	☒
y	Bowel cancer *(colorectal cancer)*	☒
z	Skin cancer *(including melanoma)*	☒
aa	Other cancer *(please specify on page 34)*	☒
bb	None of these conditions	☒

In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
cc	Depression	☒
dd	Anxiety / nervous disorder	☒
ee	Other psychiatric disorder	☒
ff	Chronic Fatigue Syndrome	☒
gg	None of these conditions	☒

In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
hh	Macular degeneration	☒
ii	Cataracts	☒
jj	Glaucoma	☒
kk	None of these conditions	☒

In the PAST THREE YEARS, have you been diagnosed or treated for: *(Mark all that apply)*

		Yes, in the past 3 years
ll	Sexually transmitted infection *(eg genital herpes or warts, chlamydia)*	☒
mm	Other major illness or disability *(please specify on page 34)*	☒
nn	None of these conditions	☒

Q33 In the PAST THREE YEARS, have you had any of the following operations or procedures? *(Mark all that apply)*

		Yes, in the past 3 years
a	Both ovaries removed	☒
b	Hysterectomy	☒
c	Repair of prolapsed vagina, bladder or bowel	☒
d	Hip surgery or hip replacement	☒
e	Knee replacement	☒
f	Other knee surgery / arthroscopy	☒
g	Shoulder surgery	☒
h	Mastectomy *(removal of one or both breasts)*	☒
i	Lumpectomy *(removal of lump from breast)*	☒
j	Removal of skin cancer	☒
k	Any cancer surgery *(other than skin or breast)*	☒
l	Chemotherapy or radiotherapy for any cancer	☒
m	Breast biopsy *(taking a sample of breast tissue)*	☒
n	Hysteroscopy *(investigative procedure to examine the uterus)*	☒
o	Cholecystectomy *(gall bladder removed)*	☒
p	Gastroscopy / colonoscopy	☒
q	Gastric banding surgery	☒
r	None of these	☒

Q34 If you have had a hysterectomy, how old were you?

(PRINT age in the box) ☐☐ years old

Q35 How would you rate the overall condition of your teeth, dentures or gums? *(Mark one only)*

- Excellent ☒
- Very good ☒
- Good ☒
- Fair ☒
- Poor ☒

Q36 In the PAST FOUR WEEKS, have you taken any: *(Mark one on each line)*

		Yes	No
a	Medications prescribed by a doctor?	☒	☒
b	Medications / vitamins / supplements or herbal therapies bought without a prescription at the chemist, supermarket or health food shop?	☒	☒
c	Medications to help you sleep?	☒	☒

Q37 **In the PAST FOUR WEEKS, have you taken any:** *(Mark one on each line)*

		Yes	No
a	Glucosamine	☒	☒
b	Paracetamol	☒	☒
c	Omega 3 *(eg fish oil)*	☒	☒
d	Calcium tablets / Caltrate	☒	☒
e	Vitamin D	☒	☒
f	Vitamin C	☒	☒
g	Vitamin B or Vitamin B Complex	☒	☒
h	Multivitamins	☒	☒
i	Aspirin *(eg Aspro clear)*	☒	☒
j	Magnesium supplements	☒	☒
k	Ventolin *(salbutamol)*	☒	☒
l	CoEnzyme Q10 (CoQ10)	☒	☒
m	Zinc	☒	☒
n	Lysine	☒	☒

Q38 **If you were to consider your life in general these days, how happy or unhappy would you say you are on the whole?** *(Mark one only)*

- Extremely happy ☒
- Very happy ☒
- Pretty happy ☒
- Unhappy sometimes ☒
- Unhappy usually ☒

Q39 **Thinking about your current approach to life, please indicate how much you think each statement describes you:** *(Mark one on each line)*

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a	In uncertain times, I usually expect the best	☒	☒	☒	☒	☒
b	If something can go wrong for me, it will	☒	☒	☒	☒	☒
c	I'm always optimistic about my future	☒	☒	☒	☒	☒
d	I hardly ever expect things to go my way	☒	☒	☒	☒	☒
e	I rarely count on good things happening to me	☒	☒	☒	☒	☒
f	Overall, I expect more good things to happen to me than bad	☒	☒	☒	☒	☒

Q40 a. How much do you weigh? *(no clothes or shoes)*

☐☐☐ kgs **OR** ☐☐ stones ☐☐ pounds

b. How tall are you without shoes?

☐☐☐ cms **OR** ☐ feet ☐☐ inches

Q41 What is your waist measurement?

*Please measure your waist while in your underwear. If possible, get someone to help you take the measurement. Find your navel (belly button) and measure at that level. Be careful not to have the tape too tight. You should be able to slip your little finger under it comfortably. Write the measurement to the **nearest** centimetre (or inches if this is the only measure you have available).*

☐☐☐ cms **OR** ☐☐ inches

Q42 In the LAST 12 MONTHS, have you had any of the following: *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
a	Allergies, hay fever, sinusitis	☒	☒	☒	☒
b	Breathing difficulty	☒	☒	☒	☒

In the LAST 12 MONTHS, have you had any of the following: *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
c	Indigestion / heartburn	☒	☒	☒	☒
d	Chest pain	☒	☒	☒	☒
e	Headaches / migraines	☒	☒	☒	☒
f	Severe tiredness	☒	☒	☒	☒
g	Back pain	☒	☒	☒	☒

In the LAST 12 MONTHS, have you had any of the following: *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
h	Stiff or painful joints	☒	☒	☒	☒
i	Problems with one or both shoulders	☒	☒	☒	☒
j	Problems with one or both hips	☒	☒	☒	☒
k	Problems with one or both knees	☒	☒	☒	☒
l	Problems with one or both feet	☒	☒	☒	☒

Q42 continued

In the LAST 12 MONTHS, have you had any of the following: *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
m	Urine that burns or stings	☒	☒	☒	☒
n	Haemorrhoids *(piles)*	☒	☒	☒	☒
o	Other bowel problems	☒	☒	☒	☒
p	Vaginal discharge or irritation	☒	☒	☒	☒
q	Hot flushes	☒	☒	☒	☒
r	Night sweats	☒	☒	☒	☒
s	Leaking urine	☒	☒	☒	☒

In the LAST 12 MONTHS, have you had any of the following: *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
t	Eyesight problems	☒	☒	☒	☒
u	Mouth, teeth or gum problems	☒	☒	☒	☒
v	Avoided eating some foods because of problems with your teeth, mouth or dentures	☒	☒	☒	☒
w	Hearing problems	☒	☒	☒	☒

In the LAST 12 MONTHS, have you had any of the following: *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
x	Depression	☒	☒	☒	☒
y	Anxiety	☒	☒	☒	☒
z	Episodes of intense anxiety *(eg panic attacks)*	☒	☒	☒	☒
aa	Palpitations *(feeling that your heart is racing or fluttering in your chest)*	☒	☒	☒	☒

In the LAST 12 MONTHS, have you had any of the following: *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
bb	Poor memory	☒	☒	☒	☒
cc	Dizziness, loss of balance	☒	☒	☒	☒
dd	Difficulty concentrating	☒	☒	☒	☒

Q43 **Managing time is often difficult. How often do you feel:** *(Mark one on each line)*

		Every day	A few times a week	About once a week	About once a month	Never
a	That you are rushed, pressured, too busy?	☒	☒	☒	☒	☒
b	That you have time on your hands that you don't know what to do with?	☒	☒	☒	☒	☒
c	That people ask too much of your time?	☒	☒	☒	☒	☒
d	That you can spend your time the way you want to?	☒	☒	☒	☒	☒
e	That you need more 'me time'?	☒	☒	☒	☒	☒
f	That you have no control over how your time is spent?	☒	☒	☒	☒	☒

Q44 **Below is a list of the ways you might have felt or behaved. Please indicate how often you have felt this way DURING THE LAST WEEK.** *(Mark one on each line)*

		Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)
a	I was bothered by things that don't usually bother me	☒	☒	☒	☒
b	I had trouble keeping my mind on what I was doing	☒	☒	☒	☒
c	I felt depressed	☒	☒	☒	☒
d	I felt that everything I did was an effort	☒	☒	☒	☒
e	I felt hopeful about the future	☒	☒	☒	☒
f	I felt fearful	☒	☒	☒	☒
g	My sleep was restless	☒	☒	☒	☒
h	I was happy	☒	☒	☒	☒
i	I felt lonely	☒	☒	☒	☒
j	I could not 'get going'	☒	☒	☒	☒
k	I felt terrific	☒	☒	☒	☒

Think about all of the time you spend sitting during EACH DAY while at home, at work, while getting from place to place or during your spare time.

Q45 How many hours EACH DAY do you typically spend sitting down while doing things like visiting friends, driving, reading, watching television or working at a desk or computer?

a	On a usual **WEEK DAY**		hours
b	On a usual **WEEKEND DAY**		hours

The next two questions are about the amount of physical activity you did LAST WEEK.

Q46 How many <u>times</u> did you do each type of activity LAST WEEK?
Only count the number of times when the activity lasted for 10 minutes or more.
*(If you did **not** do an activity, please write '0' in the box)*

a	**Walking briskly** *(for recreation or exercise, or to get from place to place)*		times
b	**Moderate leisure activity** *(like social tennis, moderate exercise classes, recreational swimming, dancing)*		times
c	**Vigorous leisure activity** *(that makes you breathe harder or puff and pant like aerobics, competitive sport, vigorous cycling, running, swimming)*		times
d	**Vigorous household or garden chores** *(that make you breathe harder or puff and pant)*		times

Q47 If you add up all the times you spent in each activity LAST WEEK, how much time did you spend ALTOGETHER doing each type of activity?
(If you did not do an activity, please write '0' in the box)

a	**Walking briskly** *(for recreation or exercise, or to get from place to place)*		hours		minutes
b	**Moderate leisure activity** *(like social tennis, moderate exercise classes, recreational swimming, dancing)*		hours		minutes
c	**Vigorous leisure activity** *(that makes you breathe harder or puff and pant like aerobics, competitive sport, vigorous cycling, running, swimming)*		hours		minutes
d	**Vigorous household or garden chores** *(that make you breathe harder or puff and pant)*		hours		minutes

Q48 Over the LAST TWELVE MONTHS, how stressed have you felt about the following areas of your life? *(Mark one on each line)*

		Not at all stressed	Somewhat stressed	Moderately stressed	Very stressed	Extremely stressed
a	Own health	☒	☒	☒	☒	☒
b	Living arrangements	☒	☒	☒	☒	☒
c	Money	☒	☒	☒	☒	☒

Over the LAST TWELVE MONTHS, how stressed have you felt about the following areas of your life? *(Mark one on each line)*

		Not applicable	Not at all stressed	Somewhat stressed	Moderately stressed	Very stressed	Extremely stressed
d	Health of family members	☒	☒	☒	☒	☒	☒
e	Work / employment	☒	☒	☒	☒	☒	☒
f	Study	☒	☒	☒	☒	☒	☒
g	Relationship with parents	☒	☒	☒	☒	☒	☒
h	Relationship with partner / spouse	☒	☒	☒	☒	☒	☒
i	Relationship with children	☒	☒	☒	☒	☒	☒
j	Relationship with other family members	☒	☒	☒	☒	☒	☒

Q49 How much do you agree or disagree with each of the following statements? *(Mark one on each line)*

		Disagree strongly	Disagree	Disagree slightly	Agree slightly	Agree	Agree strongly
a	At home, I feel I have control over what happens in most situations	☒	☒	☒	☒	☒	☒
b	I feel that what happens in my life is often determined by factors beyond my control	☒	☒	☒	☒	☒	☒
c	Over the next 5-10 years I expect to have more positive than negative experiences	☒	☒	☒	☒	☒	☒
d	I often have the feeling that I am being treated unfairly	☒	☒	☒	☒	☒	☒
e	In the past 10 years my life has been full of changes without my knowing what will happen next	☒	☒	☒	☒	☒	☒
f	I gave up trying to make big improvements or changes in my life a long time ago	☒	☒	☒	☒	☒	☒

Q50 Have you experienced the following events? *(Mark all that apply)*

		Yes, in the last 12 months	Yes, over 12 months ago	No
a	I was ignored or not taken seriously because of my age	☒	☒	☒
b	I was patronised or 'talked down to' because of my age	☒	☒	☒
c	I was denied medical treatment because of my age	☒	☒	☒
d	I was denied employment because of my age	☒	☒	☒

Q51 How often do you usually drink alcohol? *(Mark one only)*

- ☒ I have never drunk alcohol in my life → GO TO Q54
- ☒ I never drink alcohol, but I have in the past → GO TO Q54
- ☒ I drink rarely
- ☒ Less than once a week
- ☒ On 1 or 2 days a week
- ☒ On 3 or 4 days a week
- ☒ On 5 or 6 days a week
- ☒ Every day

Q52 On a day when you drink alcohol, how many standard drinks do you usually have? *(Mark one only)*

- ☒ 1 or 2 drinks per day
- ☒ 3 or 4 drinks per day
- ☒ 5 to 8 drinks per day
- ☒ 9 or more drinks per day

Q53 How often do you have five or more standard drinks of alcohol on one occasion? *(Mark one only)*

- ☒ Never
- ☒ Less than once a month
- ☒ About once a month
- ☒ About once a week
- ☒ More than once a week

Q54 How many glasses / cups of non-alcoholic drinks do you usually have each day *(eg juice, tea, coffee, water, milk etc)*? *(Mark one only)*

- ☒ 0 – 2 glasses
- ☒ 3 – 5 glasses
- ☒ 6 – 8 glasses
- ☒ 9 or more glasses

Questions 55 to 72 are modified from the *Cancer Council of Victoria Food Frequency Questionnaire* and are used with permission.

This section is about your usual eating habits over the LAST 12 MONTHS. Where possible, give only one answer per question for the type of food you eat most often (if you can't decide which type you have most often, answer for the types you usually eat).

Q55 How many pieces of FRESH fruit do you usually eat per day? *(Count ½ cup of diced fruit, berries or grapes as one piece)*

- I don't eat fruit
- Less than 1 piece of fruit per day
- 1 piece of fruit per day
- 2 pieces of fruit per day
- 3 pieces of fruit per day
- 4 or more pieces of fruit per day

Q56 How many different vegetables do you usually eat per day? *(Count all types, fresh, frozen or tinned)*

- Less than 1 vegetable per day
- 1 vegetable per day
- 2 vegetables per day
- 3 vegetables per day
- 4 vegetables per day
- 5 vegetables per day
- 6 or more vegetables per day

Q57 What type of milk do you usually use?

- **a** None
- **b** Full cream milk
- **c** Reduced fat milk
- **d** Skim milk
- **e** Soya milk

Q58 How much milk do you usually use per day? *(Include flavoured milk and milk added to tea, coffee, cereal etc)*

- None
- Less than 250 ml *(1 large cup or mug)*
- Between 250 and 500 ml *(1-2 cups)*
- Between 500 and 750 ml *(2-3 cups)*
- 750 ml *(3 cups)* or more

Q59 What type of bread do you usually eat?

- **a** I don't eat bread
- **b** High fibre white bread
- **c** White bread
- **d** Wholemeal bread
- **e** Rye bread
- **f** Multi-grain bread

Q60 How many slices of bread do you usually eat per day? *(Include all types, fresh or toasted and count one bread roll as 2 slices)*

- Less than 1 slice per day
- 1 slice per day
- 2 slices per day
- 3 slices per day
- 4 slices per day
- 5-7 slices per day
- 8 or more slices per day

Q61 Which spread do you usually put on bread?

- **a** I don't usually use any fat spread
- **b** Margarine of any kind
- **c** Polyunsaturated margarine
- **d** Monounsaturated margarine
- **e** Butter and margarine blends
- **f** Butter

Q62 On average, how many teaspoons of sugar do you usually use per day? *(Include sugar taken with tea and coffee and on breakfast cereal etc)*

- None
- 1 to 4 teaspoons per day
- 5 to 8 teaspoons per day
- 9 to 12 teaspoons per day
- More than 12 teaspoons per day

Q63 On average, how many eggs do you usually eat per week?

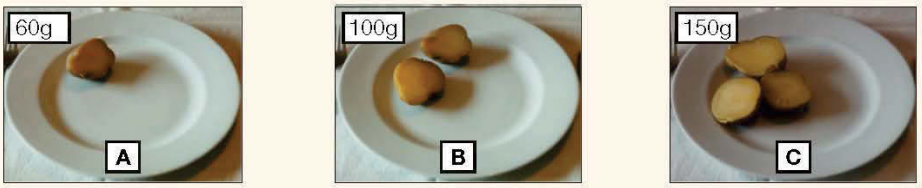
- I don't eat eggs
- Less than 1 egg per week
- 1 to 2 eggs per week
- 3 to 5 eggs per week
- 6 or more eggs per week

Q64 What types of cheese do you usually eat?

- **a** I don't eat cheese
- **b** Hard cheeses, eg parmesan, romano
- **c** Firm cheeses, eg cheddar, edam
- **d** Soft cheeses, eg camembert, brie
- **e** Ricotta or cottage cheese
- **f** Cream cheese
- **g** Low fat cheese

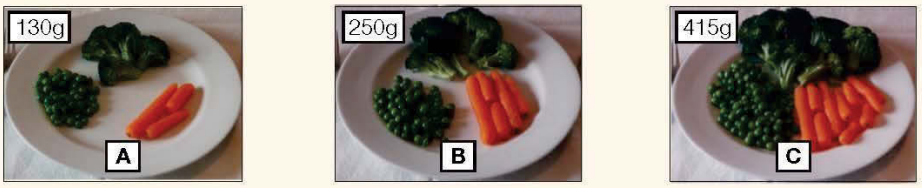
*For each food shown on this page, indicate **how much on average you would usually have eaten at main meals during the PAST 12 MONTHS**. When answering each question, think of the amount of that food you usually ate, even though you may rarely have eaten the food on its own. If you usually ate more than one helping, choose the serving size closest to the **total amount** you ate.*

Q65 When you ate potato, did you usually eat: ☒ I never ate potato



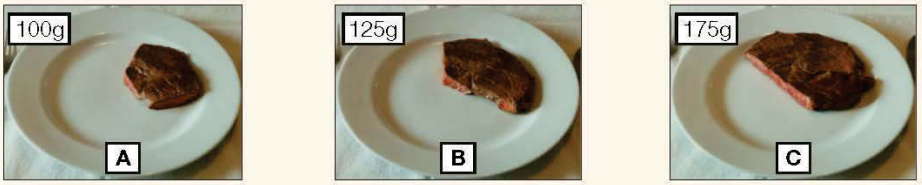
☒ Less than A ☒ A ☒ Between A and B ☒ B ☒ Between B and C ☒ C ☒ More than C

Q66 When you ate vegetables, did you usually eat: ☒ I never ate vegetables



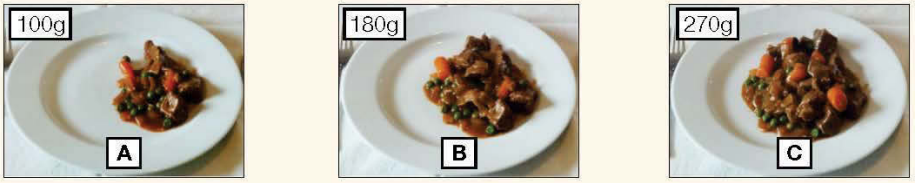
☒ Less than A ☒ A ☒ Between A and B ☒ B ☒ Between B and C ☒ C ☒ More than C

Q67 When you ate steak, did you usually eat: ☒ I never ate steak



☒ Less than A ☒ A ☒ Between A and B ☒ B ☒ Between B and C ☒ C ☒ More than C

Q68 When you ate meat or vegetable casserole, did you usually eat: ☒ I never ate casserole



☒ Less than A ☒ A ☒ Between A and B ☒ B ☒ Between B and C ☒ C ☒ More than C

Q69 Over the LAST 12 MONTHS, on average, how often did you eat the following foods?
(Mark one on each line)

	Times you have eaten	Never	Less than once per month	1 - 3 times per month	1 time per week	2 times per week	3 - 4 times per week	5 - 6 times per week	1 time per day	2 times per day	3 or more times per day
	Cereal, Foods, Sweets & Snacks										
a	All Bran	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
b	Sultana Bran™, FibrePlus™, Branflakes™	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
c	Weet Bix™, Vita Brits™, Weeties™	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
d	Cornflakes, Nutrigrain™, Special K™	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
e	Porridge	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
f	Muesli	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
g	Rice	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
h	Pasta or noodles *(include lasagne)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
i	Crackers, crispbreads, dry biscuits	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
j	Sweet biscuits	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
k	Cakes, sweet pies, tarts and other sweet pastries	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
l	Meat pies, pasties, quiche, and other savoury pastries	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
m	Pizza	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
n	Hamburger with a bun	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
o	Chocolate	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
p	Flavoured milk drink *(cocoa, Milo™ etc)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
q	Nuts	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
r	Peanut butter or peanut paste	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
s	Corn chips, potato crisps, Twisties™ etc	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
t	Jam, marmalade, honey or syrups	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
u	Vegemite™, Marmite™ or Promite™	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
	Dairy Products, Meat & Fish										
a	Cheese	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
b	Ice-cream	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
c	Yoghurt	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
d	Beef	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
e	Veal	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
f	Chicken	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
g	Lamb	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
h	Pork	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
i	Bacon	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
j	Ham	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
k	Corned beef, luncheon meats or salami	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
l	Sausages or frankfurters	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
m	Fish, steamed, grilled or baked	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
n	Fish, fried *(include take-away)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
o	Fish, tinned *(salmon, tuna, sardines etc)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

	Times you have eaten (continued)	Never	Less than once per month	1 - 3 times per month	1 time per week	2 times per week	3 - 4 times per week	5 - 6 times per week	1 time per day	2 times per day	3 or more times per day
	Fruit										
a	Tinned or frozen fruit *(any kind)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
b	Fruit juice	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
c	Oranges or other citrus fruit	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
d	Apples	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
e	Pears	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
f	Bananas	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
g	Watermelon, rockmelon *(cantaloupe)*, honeydew etc	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
h	Pineapple	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
i	Strawberries	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
j	Apricots	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
k	Peaches or nectarines	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
l	Mango or paw paw	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
m	Avocado	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
	Vegetables (including fresh, frozen and tinned)										
a	Potatoes roasted or fried *(include hot chips)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
b	Potatoes cooked without fat	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
c	Tomato sauce, tomato paste or dried tomatoes	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
d	Fresh or tinned tomatoes	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
e	Peppers *(capsicum)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
f	Lettuce, endive, or other salad greens	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
g	Cucumber	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
h	Celery	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
i	Beetroot	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
j	Carrots	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
k	Cabbage or Brussels sprouts	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
l	Cauliflower	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
m	Broccoli	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
n	Silverbeet or spinach	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
o	Peas	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
p	Green beans	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
q	Bean sprouts or alfalfa sprouts	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
r	Baked beans	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
s	Soy beans, soy bean curd or tofu	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
t	Other beans *(include chick peas, lentils etc)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
u	Pumpkin	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
v	Onion or leeks	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
w	Garlic *(not garlic tablets)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
x	Mushrooms	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
y	Zucchini	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

Q70 Over the LAST 12 MONTHS, how often did you drink beer, wine and / or spirits? *(Mark one on each line)*

If you **do NOT drink alcohol**, mark here → ☒ and go to Q73

	Times that you drank	Never	Less than once per month	1 to 3 days per month	1 day per week	2 days per week	3 days per week	4 days per week	5 days per week	6 days per week	Every day
a	Beer *(low alcohol)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
b	Beer *(full strength)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
c	Red wine	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
d	White wine *(include sparkling wines)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
e	Fortified wines, port, sherry etc	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
f	Spirits, liqueurs etc	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

When answering the next two questions, please convert the amounts you drink into glasses using the examples given below. For spirits, liqueurs, and mixed drinks containing spirits, please count each nip (30 ml) as one glass.

1 can or stubby of beer = 2 glasses
1 large bottle beer (750 ml) = 4 glasses
1 bottle wine (750 ml) = 6 glasses
1 bottle of port or sherry (750 ml) = 12 glasses

Q71 Over the LAST 12 MONTHS, on days when you were drinking, how many glasses of beer, wine and / or spirits altogether did you ***usually*** drink? *(Mark one only)*

	One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten or more
Number of glasses per day	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

Q72 Over the LAST 12 MONTHS, what was the ***maximum*** number of glasses of beer, wine and / or spirits that you drank in 24 hours? *(Mark one only)*

	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19 or more
Maximum number of glasses per 24 hours	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

Q73 How often do you currently smoke cigarettes or any tobacco products? *(Mark one only)*

Daily ☒ → GO TO Q74
At least weekly *(but not daily)* ☒
Less often than weekly ☒ → GO TO Q75
Not at all ☒

Q74 If you smoke daily, on average how many cigarettes do you smoke EACH DAY?

(PRINT the number in the box) ☐☐☐ cigarettes per day →GO TO Q77

Q75 Have you ever smoked daily?
(Mark one only)

Yes ☒

No ☒ →IF NO, GO TO Q77

Q76 At what age did you finally stop smoking DAILY?

(PRINT age in the box) ☐☐ years old

Q77 Over the last 12 months, on average, how often did you drink the following?
(Mark one on each line)

		Never	Less than once per month	1 to 3 times per month	1 time per week	2 times per week	3 to 4 times per week	5 to 6 times per week	1 time per day	2 times per day	3 or more times per day
a	Cola drinks / not diet *(eg Coke®)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
b	Diet cola drinks *(eg Diet Coke®)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
c	Other carbonated / not diet *(eg fizzy / soft drinks)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
d	Other carbonated / diet *(eg diet lemonade)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
e	Non-carbonated / not diet cordials, fruit or sport drinks	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
f	Non-carbonated / diet cordials, fruit or sport drinks	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
g	Milk or soya milk *(including flavoured varieties)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
h	Fruit or vegetable juices	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
i	Tea	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
j	Herbal tea	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
k	Coffee	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
l	Water *(including soda or plain mineral water)*	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

Q78 These questions are about getting on with other people: *(Mark one on each line)*

		Yes	No
a	Do you feel uncomfortable with anyone in your family?	☒	☒
b	Do you feel that nobody wants you around?	☒	☒
c	Has anyone forced you to do things you didn't want to do?	☒	☒
d	Has anyone taken things that belong to you without your OK?	☒	☒
e	Has anyone close to you tried to hurt or harm you recently?	☒	☒
f	Has anyone close to you called you names or put you down or made you feel bad recently?	☒	☒
g	Are you afraid of anyone in your family?	☒	☒
h	Have you ever been in a violent relationship with a partner / spouse?	☒	☒

Q79 If you have ever lived with a violent partner or spouse, in which years did you experience violence? *(Mark all that apply)*

a	I have never lived with a violent partner or spouse	☒
b	Before 2007	☒
c	2007	☒
d	2008	☒
e	2009	☒
f	2010	☒
g	2011	☒
h	2012	☒
i	2013	☒

Q80 Which of the following events have you experienced? *(Mark all that apply)*

		Yes, in the last 12 months	Yes, more than 12 months ago	Never
a	Being pushed, grabbed, shoved, kicked or hit	☒	☒	☒
b	Being forced to take part in unwanted sexual activity	☒	☒	☒

Q81 As a child did you experience sexual abuse *(eg forced to engage in unwanted sexual practices such as unwanted touching, exposure or penetration)*? *(Mark one only)*

Yes	☒
No	☒
I prefer not to answer	☒

If you answered YES to any of the last 4 questions, you might like to talk to someone about how you are feeling. You could ring Lifeline on 13 11 14 (local call).

Q82 Have you used any of these methods to lose weight or to control your weight or shape in the LAST TWELVE MONTHS? *(Mark one on each line)*

		Yes	No
a	Commercial weight loss programs *(eg Weight Watchers®, Lite n' Easy®, Sureslim®, Jenny Craig®)*	☒	☒
b	Online weight loss programs *(Biggest Loser Club®, 31 Day Fat Loss Cure Program®)*	☒	☒
c	Meal replacements or slimming products *(eg OPTIFAST®, Herbalife®, Tony Ferguson®)*	☒	☒
d	Exercise	☒	☒
e	Cut down on the size of meals or between meal snacks	☒	☒
f	Cut down on fats *(low fat)* and / or sugars	☒	☒
g	Low glycaemic index *(GI)* diet	☒	☒
h	Diet book diets *(eg Atkins, Zone, CSIRO diet, Liver Cleansing diet)*	☒	☒
i	Laxatives, diuretics or diet pills *(eg Xenical®, Reductil®)*	☒	☒
j	Smoking	☒	☒

Q83 In a USUAL WEEK, how much time in total do you spend doing the following things? *(Mark one on each line)*

		I don't do this activity	1-15 hours	16-24 hours	25-34 hours	35-40 hours	41-48 hours	49 hours or more
a	Full time paid work	☒	☒	☒	☒	☒	☒	☒
b	Part-time paid work	☒	☒	☒	☒	☒	☒	☒
c	Casual paid work	☒	☒	☒	☒	☒	☒	☒
d	Home duties *(own / family home)*	☒	☒	☒	☒	☒	☒	☒
e	Work without pay *(eg family business)*	☒	☒	☒	☒	☒	☒	☒
f	Looking for work	☒	☒	☒	☒	☒	☒	☒
g	Unpaid voluntary work	☒	☒	☒	☒	☒	☒	☒
h	Active leisure *(eg walking, exercise, sport)*	☒	☒	☒	☒	☒	☒	☒
i	Passive leisure *(eg TV, music, reading, relaxing)*	☒	☒	☒	☒	☒	☒	☒
j	Studying	☒	☒	☒	☒	☒	☒	☒
k	Socialising	☒	☒	☒	☒	☒	☒	☒
l	Buying goods and / or services *(eg paying bills, shopping)*	☒	☒	☒	☒	☒	☒	☒

Q84 Do you regularly provide (unpaid) care for grandchildren or other people's children? *(Mark one only)*

- Yes, daily ☒
- Yes, weekly ☒
- Yes, occasionally ☒
- No, never ☒

Q85 Do you regularly provide care or assistance *(eg personal care, transport)* to any other person because of their long-term illness, disability or frailty? *(Mark one on each line)*

		Yes	No	
a	For someone who lives with you	☒	☒	→ IF NO TO BOTH, GO TO Q90
b	For someone who lives elsewhere	☒	☒	

Q86 How many people with a long-term illness, disability or frailty do you regularly provide care for? *(Mark one only)*

- One person ☒
- More than one person ☒

Q87 How often in total do you provide this care or assistance? *(Mark one only)*

- Every day ☒
- Several times a week ☒
- Once a week ☒
- Once every few weeks ☒
- Less often ☒

Q88 How much time do you usually spend providing such care or assistance on each occasion? *(Mark one only)*

- All day and night ☒
- All day ☒
- All night ☒
- Several hours ☒
- About an hour ☒

Q89 Does the person you care for have any of the following major medical conditions or disabilities? *If you care for more than 1 person, please select the person you have cared for the longest and complete the question about that person.* *(Mark all that apply)*

a	Alzheimer's disease / dementia	☒
b	Autism spectrum disorder	☒
c	Autoimmune disorder	☒
d	Cancer	☒
e	Cerebral palsy	☒
f	Down syndrome	☒
g	Frailty in old age	☒
h	Head injury	☒
i	Heart condition	☒
j	Infectious disease	☒
k	Mental health problem *(eg depression, anxiety)*	☒
l	Musculoskeletal condition *(eg break / fracture)*	☒
m	Visual impairment	☒
n	Paralysis	☒
o	Respiratory condition *(eg asthma, emphysema)*	☒
p	Spinal cord injury	☒
q	Stroke	☒
r	Substance abuse / addiction	☒
s	Other neurological disorder *(eg multiple sclerosis, motor neurone disease)*	☒
t	Other reason *(please specify on page 34)*	☒

Q90 **If you DO provide care or assistance, please skip this question and go to Q91. If you DO NOT provide care or assistance to any person with a long term illness, disability or frailty, is it because you:** *(Mark one only)*

a	Used to care for someone in the last 3 years, but they passed away or moved into a nursing home or other residential care facility	☒
b	Used to care for someone in the last 3 years, but stopped caring for them for another reason *(please specify on page 34)*	☒
c	Have never provided care or assistance	☒
d	Other reason *(please specify on page 34)*	☒

Q91 We would like to know YOUR and YOUR PARTNER'S main occupation NOW:
(Mark one in each column)

	A self	B partner
Manager or administrator *(eg magistrate, farm manager, media producer, school principal)*	☒	☒
Professional *(eg registered nurse, allied health professional, teacher, artist)*	☒	☒
Associate professional *(eg office manager, branch manager, shop manager, retail buyer, youth worker, police officer)*	☒	☒
Tradesperson or related worker *(eg cook, dressmaker, hairdresser, gardener, florist)*	☒	☒
Advanced clerical or service worker *(eg credit officer, radio despatcher, personal assistant, flight attendant, law clerk)*	☒	☒
Intermediate clerical, sales or service worker *(eg accounts clerk, checkout supervisor, data entry operator, child care worker, nursing assistant, hospitality worker)*	☒	☒
Intermediate production or transport worker *(eg machine operator, bus driver)*	☒	☒
Elementary clerical, sales or service worker *(eg filing / mail clerk, parking inspector, sales assistant, telemarketer, housekeeper)*	☒	☒
Labourer or related worker *(eg cleaner, factory worker, kitchen hand, fast food cook)*	☒	☒
No paid job	☒	☒
Don't know or no partner	☒	

Q92 Please indicate the following description that best fits your life now. *(Mark one only)*

- I am not retired at all ☒
- I am partially retired ☒
- I am completely retired from paid work ☒
- I gave up paid work over 20 years ago ☒
- I have never been in paid work ☒
- Other *(please specify on page 34)* ☒

Q93 When did you retire or give up work completely?

(PRINT year in the box) ☐☐☐☐ **OR** Not applicable ☒

Q94 **At what age do you expect to retire (completely) from the paid workforce?**

(Print age, in whole years, in the box) | | | | **OR**

- ☒ Do not expect to ever retire
- ☒ Have already retired
- ☒ Don't know

Q95 **How do you manage on the income you have available?** *(Mark one only)*

- ☒ It is impossible
- ☒ It is difficult all the time
- ☒ It is difficult some of the time
- ☒ It is not too bad
- ☒ It is easy

Q96 **What are your CURRENT sources of income?** *(Mark all that apply)*

		Yes
a	Age pension / Service pension / Widow's pension / War Widow's pension	☒
b	Other government pension or allowance	☒
c	Lump sum superannuation payout	☒
d	A pension or annuity purchased with superannuation or some other funds	☒
e	Income from savings and investments *(such as shares and property)*	☒
f	Income from a business	☒
g	Income or pension from your spouse / partner	☒
h	Financial support from family	☒
i	Spouse / partner's superannuation	☒
j	Wage or salary	☒
k	Other sources *(please specify on page 34)*	☒

Q97 **Which of these things (if any) have you had to do in the last 3 years, to help manage financially?** *(Mark all that apply)*

a	☒ Sell your house or move to lower cost accommodation
b	☒ Sell something else you own, like a holiday house, or car or jewellery
c	☒ Share housing with relatives or friends
d	☒ Cut back on your normal weekly spending
e	☒ Cut back on less frequent expenditures such as holidays, new cars & large household goods
f	☒ Take on paid work
g	☒ Rely on your spouse / partner going out to work or increasing their working hours
h	☒ None of the above

Q98 **People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?** *(Mark one on each line)*

		None of the time	A little of the time	Most of the time	All of the time
a	Someone to help you if you are confined to bed	☒	☒	☒	☒
b	Someone you can count on to listen to you when you need to talk	☒	☒	☒	☒
c	Someone to give you good advice about a crisis	☒	☒	☒	☒
d	Someone to take you to the doctor if you need it	☒	☒	☒	☒
e	Someone who shows you love and affection	☒	☒	☒	☒
f	Someone to have a good time with	☒	☒	☒	☒
g	Someone to give you information to help you understand a situation	☒	☒	☒	☒
h	Someone to confide in or talk to about yourself or your problems	☒	☒	☒	☒
i	Someone who hugs you	☒	☒	☒	☒
j	Someone to get together with for relaxation	☒	☒	☒	☒
k	Someone to prepare your meals if you are unable to do it yourself	☒	☒	☒	☒
l	Someone whose advice you really want	☒	☒	☒	☒
m	Someone to do things with to help you get your mind off things	☒	☒	☒	☒
n	Someone to help with daily chores if you are sick	☒	☒	☒	☒
o	Someone to share your most private worries and fears with	☒	☒	☒	☒
p	Someone to turn to for suggestions about how to deal with a personal problem	☒	☒	☒	☒
q	Someone to do something enjoyable with	☒	☒	☒	☒
r	Someone who understands your problems	☒	☒	☒	☒
s	Someone to love and make you feel wanted	☒	☒	☒	☒

Q99 **What is your present marital status?** *(Mark one only)*

- Married *(registered)* ☒
- De facto relationship *(opposite sex)* ☒
- De facto relationship *(same sex)* ☒
- Separated ☒
- Divorced ☒
- Widowed ☒
- Never married ☒

Q100 **If you have been widowed, please write the date of bereavement in the boxes below:**
(if widowed more than once please give all dates)

☒ I have never been widowed

Date 1 D D M M Y Y Y Y

Date 2 D D M M Y Y Y Y

Date 3 D D M M Y Y Y Y

Date 4 D D M M Y Y Y Y

Q101 **How many people live with you now?** *(Mark all that apply)*

a	No one, I live alone	☒			
b	Partner or spouse	☒			
		None	One	Two	Three or more
c	Children up to 18 years	☒	☒	☒	☒
d	Children over 18 years	☒	☒	☒	☒
e	Your parents or in-laws	☒	☒	☒	☒
f	Other adult relatives	☒	☒	☒	☒
g	Other adults (not family members)	☒	☒	☒	☒

Q102 **What is your postcode?**

☒ Mark here if living overseas

a	What is your RESIDENTIAL postcode? *(where you live)*	
b	What is the postcode of your POSTAL ADDRESS? *(if different from residential)*	

Q103 **In general, are you satisfied with what you have achieved in your life so far in the areas of:**
(Mark one on each line)

		Very satisfied	Satisfied	Dissatisfied	Very Dissatisfied
a	Work	☒	☒	☒	☒
b	Career	☒	☒	☒	☒
c	Study	☒	☒	☒	☒
d	Family relationships	☒	☒	☒	☒
e	Partner / closest personal relationship	☒	☒	☒	☒
f	Friendships	☒	☒	☒	☒
g	Social activities	☒	☒	☒	☒

Q104 What is your date of birth?

D D / M M / 1 9 Y Y

Day Month Year

Q105 Did someone help you fill in this survey? *(Mark one only)*

- No ☒
- Yes, but I told them the answers I wanted ☒
- Yes, but the helper answered for me using his / her own judgement ☒

Q106 What was the MAIN reason for your needing help to fill in this survey? *(Please describe)*

Have we missed anything?

If there is ANYTHING else you would like to tell us about changes in your health (especially in the last three years) please write on the lines below.

OFFICE USE ONLY – DO NOT DETACH

CONSENT FORM

1946-51 Main Survey 7, 2013

I agree to the research team following health and other records relating to me, including hospital and health service use records and cancer registers and other chronic conditions registers as described to me in the accompanying brochure. I also understand this means I agree to Medicare releasing information concerning services provided to me under Medicare, the Department of Veterans' Affairs, the Pharmaceutical Benefits Scheme and the Repatriation Pharmaceutical Benefits Scheme, including past information, for the duration of the study, as outlined in the enclosed brochure. *(Mark one only)*

Yes ☒ **No** ☒

Please sign below and send the completed survey back to us in the envelope supplied as soon as possible.
We will detach the consent form and store it in a separate locked room.

SIGNATURE: DATE: / /

Have you remembered to measure your waist? - Page 14, Question 41

Help us keep in touch!

Sometimes we lose touch with our participants. It would be helpful if you could give us your mobile phone number and email address.

Mobile

Email

It would be helpful also if you could give us details of **a relative or friend** who will be able to help us find you, after checking that the relative or friend is happy for you to provide these details.

Name

Address

Town / Suburb State Postcode

Phone ( )

Relationship to you

Thank you for taking the time to complete this survey.

If you need help to answer any of the questions, you can contact us by telephoning 1800 068 081 (Free call).

Please let us know your new details if you move, change your name or your telephone number.

Don't forget to sign the consent and post this back to us in the Reply Paid envelope provided!

No stamp required if posted in Australia

Women's Health Australia
Reply Paid 70
Hunter Region MC
NSW 2310

women's health australia

australian longitudinal study on women's health

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

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THE UNIVERSITY OF QUEENSLAND AUSTRALIA

Appendix 2 Australian Longitudinal Study on Women's Health sixth survey of the young cohort women (Survey 6)

Sixth survey for the women of the 1973-78 cohort

2012

How to complete this survey

This is the sixth survey for the women of the 1973-78 cohort.
As the purpose of the project is to look at changes over time, some of the questions are the same as those in previous surveys. Researchers will be comparing the information provided in this survey with that of surveys you have completed in the past.

Please answer every question you can. If you are unsure about how to answer a question, mark the response for the closest answer to how you feel.

Please answer the survey for the time period indicated even if you are pregnant or your circumstances are unusual in some way (unless the question states otherwise).

Please read the instructions above each question carefully. Some require you to answer only those options which are applicable to you. Other questions require you to mark one answer on each line. The questions may also refer to different time periods.

INSTRUCTIONS:

- Use a black / blue biro
- Do not fold or bend this survey

Cross the boxes like this:

In general, would you say your health is:
(Mark one only)

- Excellent ☐
- Very good ☐
- Good ☒ ← *You would mark this one if you think your health is good*
- Fair ☐
- Poor ☐

Print clearly in the boxes like this:

What is your postcode?
(PRINT clearly in the boxes)

2	3	0	8

Correct mistakes like this:

When you go to a General Practitioner:
(Mark one on each line)

	Always	Most of the time	Some-times	Rarely or never
Do you go to the same place?	☐	☒	☒	☐

If you make a mistake simply scribble it out and clearly mark the correct answer with a cross

If you need help to answer any questions, please ring 1800 068 081
(This is a FREECALL number)

* *If you are concerned about any of your health experiences and would like some help, you may like to contact:*
  - *your nearest Women's Health Centre or Community Health Centre*
  - *your General Practitioner for advice about who would be the best person in your community to talk to.*

* *If you feel distressed now and would like someone to talk to, you could ring Lifeline on 13 11 14(local call).*

Q1 How many times have you consulted the following people for ***your own health*** in the ***last 12 months***? *(Mark one on each line)*

		None	1-2 times	3-4 times	5-6 times	7-9 times	10-12 times	More than 12 times
a	A family doctor or another General Practitioner (GP)	☐	☐	☐	☐	☐	☐	☐
b	A specialist doctor	☐	☐	☐	☐	☐	☐	☐
c	A dentist	☐	☐	☐	☐	☐	☐	☐

Q2 Have you consulted the following services for ***your own health*** in the ***last 12 months***? *(Mark one on each line)*

		Yes	No
a	A hospital doctor (eg in outpatients or casualty)	☐	☐
b	A midwife	☐	☐
c	A counsellor or other mental health worker	☐	☐
d	A chiropractor	☐	☐
e	An osteopath	☐	☐
f	A massage therapist	☐	☐
g	An acupuncturist	☐	☐
h	A naturopath / herbalist	☐	☐
i	Another alternative health practitioner (eg aromatherapist, homeopath, reflexologist, iridologist)	☐	☐
j	A community nurse, practice nurse or nurse practitioner	☐	☐
k	A physiotherapist	☐	☐

Q3 How often have you used the following therapies for ***your own health*** in the ***last 12 months***? *(Mark one on each line)*

		Never	Rarely	Sometimes	Often
a	Vitamins / minerals	☐	☐	☐	☐
b	Yoga or meditation	☐	☐	☐	☐
c	Herbal medicines	☐	☐	☐	☐
d	Aromatherapy oils	☐	☐	☐	☐
e	Chinese medicines	☐	☐	☐	☐
f	Other alternative therapies	☐	☐	☐	☐

Q4 Have you been admitted to hospital in the ***last 12 months*** for any of these reasons? *(Mark one on each line)*

		Yes	No
a	Normal childbirth	☐	☐
b	Problems during pregnancy	☐	☐
c	All other reasons	☐	☐

Q5 When you go to a General Practitioner: *(Mark one on each line)*

		Always	Most of the time	Sometimes	Rarely or never
a	Do you go to the same place?	☐	☐	☐	☐
b	Do you usually see the same doctor?	☐	☐	☐	☐

Q6 **Here are some questions about your *most recent visit* to a General Practitioner. In terms of your *satisfaction*, how would you rate each of the following?**
(Mark one on each line)

		Excellent	Very good	Good	Fair	Poor
a	The amount of time you spent with the doctor	☐	☐	☐	☐	☐
b	The doctor's explanation of your problem and treatment	☐	☐	☐	☐	☐
c	The doctor's interest in how you felt about having the tests, treatment or the advice given	☐	☐	☐	☐	☐
d	Your opportunity to ask all the questions you wanted	☐	☐	☐	☐	☐
e	The technical skills (thoroughness, carefulness, competence) of the doctor	☐	☐	☐	☐	☐
f	The personal manner (courtesy, respect, sensitivity, friendliness) of the doctor	☐	☐	☐	☐	☐
g	The cost to you of the visit	☐	☐	☐	☐	☐
	Mark here if No Cost →	☐				

Q7 **In general, do you prefer to see a female doctor?** *(Mark one only)*

- Yes, always ☐
- Yes, but only for certain things ☐
- No ☐
- Don't care ☐

Q8 **Thinking about *your own health care*, how would you rate the following now?**
(Mark one on each line)

		Excellent	Very good	Good	Fair	Poor	Don't know
a	Access to medical specialists if you need them	☐	☐	☐	☐	☐	☐
b	Access to a hospital if you need it	☐	☐	☐	☐	☐	☐
c	Access to after-hours medical care	☐	☐	☐	☐	☐	☐
d	Access to a GP who bulk bills	☐	☐	☐	☐	☐	☐
e	Access to a female GP	☐	☐	☐	☐	☐	☐
f	Hours when a GP is available	☐	☐	☐	☐	☐	☐
g	Number of GPs you have to choose from	☐	☐	☐	☐	☐	☐
h	Ease of seeing the GP of your choice	☐	☐	☐	☐	☐	☐
i	Ease of obtaining a Pap test	☐	☐	☐	☐	☐	☐
j	Access to Women's Health or Family Planning services	☐	☐	☐	☐	☐	☐
k	Access to maternal and child health services	☐	☐	☐	☐	☐	☐

Q9 **Do you have a Health Care Card?** *This is a card that entitles you to discounts and assistance with medical expenses. This is not the same as a Medicare card.* *(Mark one only)*

- Yes ☐
- No ☐

Q10 **Do you have private health insurance for *hospital cover*? If not, mark the main reason why.** *(Mark one only)*

Yes	☐
No – because I can't afford the cost	☐
No – because I don't think you get value for money	☐
No – because I don't think I need it	☐
No – another reason	☐

Q11 **Do you have private health insurance for *ancillary services* (eg dental, physiotherapy)? If not, mark the main reason why.** *(Mark one only)*

Yes	☐
No – because I can't afford the cost	☐
No – because I don't think you get value for money	☐
No – because I don't think I need it	☐
No – because the services are not available where I live	☐
No – another reason	☐

Q12 **In the *last 3 years*, have you been diagnosed or treated for:** *(Mark all that apply)*

	Please record conditions related to pregnancy (gestational diabetes, hypertension during pregnancy, antenatal depression and postnatal depression) in the section relating to pregnancy later in the survey.	Yes, in the last 3 years
a	Insulin dependent (Type I) diabetes	☐
b	Non-insulin dependent (Type 2) diabetes	☐
c	Heart disease	☐
d	Hypertension (high blood pressure)	☐
e	Low iron (iron deficiency or anaemia)	☐
f	Asthma	☐
g	Bronchitis	☐
h	Depression	☐
i	Anxiety disorder	☐
j	Endometriosis	☐
k	Thrombosis	☐
l	Polycystic Ovary Syndrome	☐
m	Urinary tract infection	☐
n	Chlamydia	☐
o	Genital herpes	☐
p	Genital warts (HPV)	☐
q	Hepatitis B or C	☐
r	Skin cancer	☐
s	Other cancer *(Please specify on page 26)*	☐
t	Other major physical illness *(Please specify on page 26)*	☐
u	Other major mental illness *(Please specify on page 26)*	☐
v	Other sexually transmitted infection *(Please specify on page 26)*	☐
w	Other *(Please specify on page 26)*	☐
x	**None of these conditions**	☐

Q13 In the ***last 12 months***, have you had any of the following:
(Mark one on each line. For all that apply, also answer column B.)

		A				If yes, did you seek help for this problem? B
		Never	Rarely	Some-times	Often	Mark here if you did seek help
a	Allergies, hay fever, sinusitis	☐	☐	☐	☐	☐
b	Headaches / migraines	☐	☐	☐	☐	☐
c	Severe tiredness	☐	☐	☐	☐	☐
d	Indigestion (heart burn)	☐	☐	☐	☐	☐
e	Breathing difficulties	☐	☐	☐	☐	☐
f	Stiff or painful joints	☐	☐	☐	☐	☐
g	Back pain	☐	☐	☐	☐	☐
h	Problems with one or both feet	☐	☐	☐	☐	☐
i	Urine that burns or stings	☐	☐	☐	☐	☐
j	Leaking urine	☐	☐	☐	☐	☐
k	Constipation	☐	☐	☐	☐	☐
l	Haemorrhoids (piles)	☐	☐	☐	☐	☐
m	Other bowel problems	☐	☐	☐	☐	☐
n	Vaginal discharge or irritation	☐	☐	☐	☐	☐
o	Premenstrual tension	☐	☐	☐	☐	☐
p	Irregular periods	☐	☐	☐	☐	☐
q	Heavy periods	☐	☐	☐	☐	☐
r	Severe period pain	☐	☐	☐	☐	☐
s	Skin problems	☐	☐	☐	☐	☐
t	Difficulty sleeping	☐	☐	☐	☐	☐
u	Depression	☐	☐	☐	☐	☐
v	Episodes of intense anxiety (eg panic attacks)	☐	☐	☐	☐	☐
w	Other mental health problems	☐	☐	☐	☐	☐
x	Palpitations (feeling that your heart is racing or fluttering in your chest)	☐	☐	☐	☐	☐

Q14 What is your postcode?

a What is your RESIDENTIAL postcode?
(where you live)

Mark here if living overseas ☐

b What is the postcode of your POSTAL ADDRESS?
(if different from residential)

Q15 When you are outside on a typical summer day, how often do you do the following things to protect yourself from the sun? *(Mark one on each line)*

		Never	Rarely	Some-times	Usually	Always
a	Wear a hat	☐	☐	☐	☐	☐
b	Wear clothing that protects your skin	☐	☐	☐	☐	☐
c	Wear sunglasses	☐	☐	☐	☐	☐
d	Stay in the shade when outdoors	☐	☐	☐	☐	☐
e	Apply sunscreen to face	☐	☐	☐	☐	☐
f	Apply sunscreen to exposed body parts	☐	☐	☐	☐	☐

Q16 When did you last have:

(Mark one on each line)

		Less than 2 years ago	2 to less than 3 years ago	3-5 years ago	More than 5 years ago	Never	Not sure
a	A Pap test?	☐	☐	☐	☐	☐	☐
b	Your blood pressure checked?	☐	☐	☐	☐	☐	☐
c	Your skin checked (eg spots, lesions, moles)?	☐	☐	☐	☐	☐	☐

Q17 Please write down the names of all your medications, vitamins, supplements or herbal therapies that you have taken in the *last 4 weeks*. Where possible, copy names from packets.
(Please write in block letters)

None ☐

a		h	
b		i	
c		j	
d		k	
e		l	
f		m	
g		n	

The following questions ask only about ***now*** – how your health is now and about how your health limits certain activities now.

Q18 In general, would you say your health is: *(Mark one only)*

Excellent ☐
Very good ☐
Good ☐
Fair ☐
Poor ☐

Q19 **Compared to one year ago, how would you rate your health in general now?** *(Mark one only)*

- Much better now than one year ago ☐
- Somewhat better now than one year ago ☐
- About the same as one year ago ☐
- Somewhat worse now than one year ago ☐
- Much worse now than one year ago ☐

Q20 **The following questions are about activities you might do during a typical day. Does *your health now limit you* in these activities? If so, how much?** *(Mark one on each line)*

		Yes, limited a lot	Yes, limited a little	No, not limited at all
a	Vigorous activities such as running, lifting heavy objects, participating in strenuous sports	☐	☐	☐
b	Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf	☐	☐	☐
c	Lifting or carrying groceries	☐	☐	☐
d	Climbing several flights of stairs	☐	☐	☐
e	Climbing one flight of stairs	☐	☐	☐
f	Bending, kneeling or stooping	☐	☐	☐
g	Walking more than one kilometre	☐	☐	☐
h	Walking half a kilometre	☐	☐	☐
i	Walking 100 metres	☐	☐	☐
j	Bathing or dressing yourself	☐	☐	☐

Q21 **During the *past 4 weeks*, have you had any of the following problems with your work (including your work outside the home and housework) or other regular daily activities *as a result of your physical health*?** *(Mark one on each line)*

		Yes	No
a	Cut down on the amount of time you spent on work or other activities	☐	☐
b	Accomplished less than you would like	☐	☐
c	Were limited in the kind of work or other activities	☐	☐
d	Had difficulty performing the work or other activities *(for example it took extra effort)*	☐	☐

Q22 **During the *past 4 weeks*, have you had any of the following problems with your work or other regular daily activities *as a result of any emotional problems* (such as feeling depressed or anxious)?** *(Mark one on each line)*

		Yes	No
a	Cut down on the amount of time you spent on work or other activities	☐	☐
b	Accomplished less than you would like	☐	☐
c	Didn't do work or other activities as carefully as usual	☐	☐

Q23 **During the *past 4 weeks*, to what extent has your *physical health or emotional problems* interfered with your normal social activities with family, friends, neighbours or groups?** *(Mark one only)*

- Not at all ☐
- Slightly ☐
- Moderately ☐
- Quite a bit ☐
- Extremely ☐

Q24 How much ***bodily*** pain have you had during the ***past 4 weeks***? *(Mark one only)*

- None ☐
- Very mild ☐
- Mild ☐
- Moderate ☐
- Severe ☐
- Very severe ☐

Q25 During the ***past 4 weeks***, how much did ***pain*** interfere with your normal work (including both work outside the home and housework)? *(Mark one only)*

- Not at all ☐
- A little bit ☐
- Moderately ☐
- Quite a bit ☐
- Extremely ☐

Q26 For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the ***past 4 weeks***: *(Mark one on each line)*

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
a	Did you feel full of life?	☐	☐	☐	☐	☐	☐
b	Have you been a very nervous person?	☐	☐	☐	☐	☐	☐
c	Have you felt so down in the dumps that nothing could cheer you up?	☐	☐	☐	☐	☐	☐
d	Have you felt calm and peaceful?	☐	☐	☐	☐	☐	☐
e	Did you have a lot of energy?	☐	☐	☐	☐	☐	☐
f	Have you felt down?	☐	☐	☐	☐	☐	☐
g	Did you feel worn out?	☐	☐	☐	☐	☐	☐
h	Have you been a happy person?	☐	☐	☐	☐	☐	☐
i	Did you feel tired?	☐	☐	☐	☐	☐	☐

Q27 During the ***past 4 weeks***, how much of the time has your ***physical health or emotional problems*** interfered with your social activities (like visiting friends, relatives etc)? *(Mark one only)*

- All of the time ☐
- Most of the time ☐
- Some of the time ☐
- A little of the time ☐
- None of the time ☐

Q28 How ***true*** or ***false*** is ***each*** of the following statements for you? *(Mark one on each line)*

		Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a	I seem to get sick a little easier than other people	☐	☐	☐	☐	☐
b	I am as healthy as anybody I know	☐	☐	☐	☐	☐
c	I expect my health to get worse	☐	☐	☐	☐	☐
d	My health is excellent	☐	☐	☐	☐	☐

Q29 **Have you and your partner (current or previous) ever had problems with fertility - that is, tried unsuccessfully for 12 months or more to get pregnant?** *(Mark one only)*

No, have never tried to get pregnant	☐
No, have had no problem with fertility	☐
Yes, but have not sought help / treatment	☐
Yes, and have sought help / treatment	☐

Q30 **Have you ever had any of the following operations or procedures?**
(Mark one on each line)

		Yes	No
a	Hysterectomy	☐	☐
b	One ovary removed	☐	☐
c	Both ovaries removed	☐	☐
d	Repair of prolapsed vagina, bladder or bowel	☐	☐
e	Lumpectomy *(removal of lump from breasts)*	☐	☐
f	Breast biopsy *(taking a sample of breast tissue)*	☐	☐
g	Cholecystectomy *(gall bladder removed)*	☐	☐
h	Gastric banding	☐	☐
i	Cosmetic surgery	☐	☐

Q31 **Do any of the following apply to you?** *(Mark one on each line)*

		Yes	No
a	I am pregnant now / have recently had a baby	☐	☐
b	I am trying to become pregnant	☐	☐
c	I have had a tubal ligation	☐	☐
d	My partner has had a vasectomy	☐	☐
e	I cannot have children	☐	☐
f	My partner cannot have children	☐	☐
g	My partner has a low or zero sperm count	☐	☐
h	I have no male sexual partners now	☐	☐
i	I am using / have used In Vitro Fertilisation (IVF)	☐	☐
j	I am using / have used fertility hormones (eg Clomid)	☐	☐

Q32 **What forms of contraception do you use now?** *(Mark all that apply)*

a	I use a combined oral contraceptive pill (The Pill)	☐
b	I use a progestogen only oral contraceptive pill (The Mini Pill)	☐
c	I use the oral contraceptive pill but I don't know what type	☐
d	I use condoms	☐
e	I use emergency contraception (eg morning after pill)	☐
f	I use an implant (eg Implanon)	☐
g	I use the withdrawal method	☐
h	I use a copper intrauterine device (IUD)	☐
i	I use a progestogen intrauterine device (IUD) (eg Mirena)	☐
j	I use an injection (eg Depo-provera)	☐
k	I use a safe period method (eg natural family planning, rhythm method, Billings method, body temperature method, periodic abstinence)	☐
l	I use a vaginal ring (eg Nuvaring)	☐
m	I use another method of contraception	☐
n	**I don't use contraception**	☐

Q33 **Are you currently pregnant?** *(Mark one only)*

- No ☐
- Less than 3 months ☐
- 3 to 6 months ☐
- More than 6 months ☐
- Don't know ☐

Q34 **Have you ever been pregnant?**

Yes ☐
No ☐ — If no, **go to Q47**

Q35 **How many times have you had each of the following**: *(Mark one on each line)*

		None	One	Two	Three	Four	5 or more
a	Live birth	☐	☐	☐	☐	☐	☐
b	Stillbirth	☐	☐	☐	☐	☐	☐
c	Miscarriage	☐	☐	☐	☐	☐	☐
d	Termination (abortion) for medical reasons (eg fetal abnormalities)	☐	☐	☐	☐	☐	☐
e	Termination (abortion) for other reasons	☐	☐	☐	☐	☐	☐
f	Ectopic pregnancy (tubal pregnancy)	☐	☐	☐	☐	☐	☐

Q36 **For your *most recent* pregnancy, were you**: *(Mark one on each line)*

		Never	Yes, during pregnancy	Yes, following birth	Yes, both during pregnancy and following birth
a	Given any information about emotional well being during pregnancy and early parenthood (eg about depression, anxiety, parenting stress)?	☐	☐	☐	☐
b	Asked any questions by a midwife, GP, child health nurse or other professional about your emotional well being (eg given a questionnaire to complete)?	☐	☐	☐	☐

Q37 **Have you ever given birth?**

Yes ☐
No ☐ — If no, **go to 47**

Q38 **If you have ever given birth, please write the date of each birth in the box.**
(If you had twins, please write the date twice.)

1st D D M M Y Y Y Y 2nd D D M M Y Y Y Y 3rd D D M M Y Y Y Y

4th D D M M Y Y Y Y 5th D D M M Y Y Y Y 6th D D M M Y Y Y Y

7th D D M M Y Y Y Y 8th D D M M Y Y Y Y 9th D D M M Y Y Y Y

Q39 **Did you experience any of the following?** *(Mark all that apply on each line)*

		Never experi-enced this	1st Child	2nd Child	3rd Child	4th Child	5th Child	6th Child	7th Child	8th Child	9th Child
a	Premature birth	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Stillbirth	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c	Caesarean section before going into labour	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d	Induction of labour (via gel or drip)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e	Caesarean section after labour started	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f	Labour lasting more than 36 hours	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g	Gas or injection for pain relief	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h	Epidural or spinal block	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
i	Episiotomy (cut to perineum)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
j	A vaginal tear requiring stitches	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
k	Instrumental delivery (forceps / vacuum)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
l	Emotional distress during labour	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
m	A low birth weight baby (weighing less than 2500 grams or 5 ½ pounds)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
n	A high birth weight (weighing more than 4000 grams or 8 ½ pounds)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
o	Baby requiring admission to special care / Neonatal Intensive Care Unit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
p	Death of a live-born baby within the first month	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q40 **Were you diagnosed or treated for:** *(Mark all that apply on each line)*

		Never experi-enced this	1st Child	2nd Child	3rd Child	4th Child	5th Child	6th Child	7th Child	8th Child	9th Child
a	Antenatal depression?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Postnatal depression?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c	Antenatal anxiety?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d	Postnatal anxiety?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e	Gestational diabetes?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f	Hypertension (high blood pressure) during pregnancy?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

The following questions are about breastfeeding.

Q41 **Have you ever breastfed?**

Yes ☐

No ☐ — If no, **go to Q43**

Q42

		1st Child	2nd Child	3rd Child	4th Child	5th Child	6th Child	7th Child	8th Child	9th Child
a	Mark which of your children had at least one breastfeed	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Write the number of complete months each child was breastfed (if zero write 0)	☐☐	☐☐	☐☐	☐☐	☐☐	☐☐	☐☐	☐☐	☐☐
c	Mark which child or children you are currently breastfeeding	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q43 **At the time of the birth of your last child were you employed (even if you were on leave)?**

(Mark one only)

Yes ☐

No ☐

Q44 **If you went back to paid work after the birth of your last child, how soon did you go back?**

(Please write the number of MONTHS in the boxes)

☐☐ Months Not applicable ☐

Q45 **If you did NOT go back to paid work after the birth of your last child:**

(Mark one on each line)

		Yes	No
a	Are you currently on maternity leave?	☐	☐
b	Are you planning to go back to paid work?	☐	☐

Q46 **Thinking about the birth of your last child:** *(Mark one on each line)*

		Yes	No
a	Did you take paid maternity leave?	☐	☐
b	Did you take unpaid maternity leave?	☐	☐

Q47 **Do you have children living with you (your own, your partner's, fostered etc)?** *(Mark one only)*

Yes ☐

No ☐ — If no, **go to Q51**

Q48 **If you have children living with you (your own, your partner's, fostered etc), how many are:**

(Mark one on each line)

		None	One	Two	Three	Four or more
a	Under 12 months?	☐	☐	☐	☐	☐
b	12 months - 5 years?	☐	☐	☐	☐	☐
c	6 - 12 years?	☐	☐	☐	☐	☐
d	13 - 16 years?	☐	☐	☐	☐	☐

Most parents need someone to care for their children when they cannot.
Formal child care includes before and / or after school care, long day care, family day care, occasional care and preschool. *Informal child care* includes care by family, friends (paid or unpaid) and a paid babysitter.

Q49 **Whether you use child care or not, please answer the following questions.**

	(Mark one on each line)	Yes	No	Don't know
a	Is formal child care located in an area convenient to you?	☐	☐	☐
b	Are formal child care places available to you?	☐	☐	☐
c	Is the cost of formal child care a problem for you?	☐	☐	☐
d	Is informal child care available to you?	☐	☐	☐

Q50 **In a normal week, how often do you usually use child care?** *(Mark one on each line)*

		Do not use this type of child care	Less than 5 hrs	5-10 hrs	11-20 hrs	21-30 hrs	31-40 hrs	More than 40 hrs
a	Formal care	☐	☐	☐	☐	☐	☐	☐
b	Informal care	☐	☐	☐	☐	☐	☐	☐

Q51 **How tall are you without shoes?**
(If you are not sure, please estimate)
☐☐☐ cms

Q52 **How much do you weigh without clothes or shoes? *If you are pregnant now, write in the weight you were in the month prior to pregnancy.***
(If you are not sure, please estimate)
☐☐☐ kgs

Q53 **Have you used any of these methods to lose weight or to control your weight or shape in the *last twelve months*?** *(Mark one on each line)*

		Yes	No
a	Commercial weight loss programs (eg Weight Watchers®, Lite n' Easy®, Sureslim®, Jenny Craig®)	☐	☐
b	Meal replacements or slimming products (eg OPTIFAST®, Herbalife®)	☐	☐
c	Exercise	☐	☐
d	Cut down on the size of meals or between meal snacks	☐	☐
e	Cut down on fats (low fat) and / or sugars	☐	☐
f	Low glycaemic index (GI) diet	☐	☐
g	Diet book diets (eg Atkins, Zone, CSIRO diet, Liver Cleansing diet)	☐	☐
h	Laxatives, diuretics or diet pills (eg Xenical®, Reductil®)	☐	☐
i	Fasting	☐	☐
j	Smoking	☐	☐
k	Other	☐	☐

Q54 **How much would you *like* to weigh *now*?** *(Mark one only)*

- Happy as I am ☐
- 1 – 5 kg more ☐
- Over 5 kg more ☐
- 1 – 5 kg less ☐
- 6 – 10 kg less ☐
- Over 10 kg less ☐

Q55 In the past month, how dissatisfied have you felt about: *(Mark one on each line)*

		Not at all dissatisfied		Slightly dissatisfied		Moderately dissatisfied		Markedly Dissatisfied
a	Your weight	☐	☐	☐	☐	☐	☐	☐
b	Your shape	☐	☐	☐	☐	☐	☐	☐

Q56 How often do you currently smoke cigarettes or any tobacco products? *(Mark one only)*

- Daily ☐ → **go to Q57a**
- At least weekly (but not daily) ☐ → **go to Q57b**
- Less often than weekly ☐
- Not at all ☐

→ **go to Q58**

Q57 a If you smoke daily, on average how many cigarettes do you smoke *each day*?

PRINT the number in the box ☐☐☐ cigarettes per day → **go to Q61**

b If you smoke, but not daily, on average how many cigarettes do you smoke *per week*?

PRINT the number in the box ☐☐☐ cigarettes per week

Q58 In your lifetime, would you have smoked at least 100 cigarettes (or equivalent)? *(Mark one only)* Yes ☐ No ☐ → If no, **go to Q63**

Q59 Have you ever smoked daily? *(Mark one only)* Yes ☐ No ☐ → If no, **go to Q63**

Q60 At what age did you finally stop smoking daily? *(Write age in boxes)* ☐☐ years old

Q61 Have you tried to quit smoking in the last six months? *(Mark one only)* Yes ☐ No ☐

Q62 Have you ever been advised by a doctor to quit smoking? *(Mark one only)* Yes ☐ No ☐

Q63 How often do you usually drink alcohol? *(Mark one only)*

- I never drink alcohol ☐ → **go to Q66**
- Less than once a month ☐
- Less than once a week ☐
- On 1 or 2 days a week ☐
- On 3 or 4 days a week ☐
- On 5 or 6 days a week ☐
- Every day ☐

Q64 On a day when you drink alcohol, how many standard drinks do you usually have? *(Mark one only)*

- 1 or 2 drinks per day ☐
- 3 or 4 drinks per day ☐
- 5 to 8 drinks per day ☐
- 9 or more drinks per day ☐

Q65 **How often do you have five or more standard drinks of alcohol on one occasion?**
(Mark one only)

Never	☐	About once a week	☐
Less than once a month	☐	More than once a week	☐
About once a month	☐		

***Remember** that any information you give us is kept confidential.*

Q66 **The following question asks about the use of drugs for *non-medicinal* purposes. We want to know about general patterns of use. Please do not give details of specific instances of use.** *(Mark all that apply)*

		In the last 12 months	More than 12 months ago	Never
a	Have you tried Marijuana? (cannabis, hash, grass, dope, pot, 'yandi')	☐	☐	☐
b	Have you tried any other illicit drugs? (amphetamines, LSD, natural hallucinogens, tranquilisers, cocaine, ecstasy, inhalants, heroin or barbiturates)	☐	☐	☐

The next question is about the amount of physical activity you did ***last week***.

Q67 **Please state *how many times* you did each type of activity and *how much time you spent altogether* doing each type of activity *last week*.**
Only count activities that lasted for 10 minutes or more; add up all the times you spent in each activity to get the total time for each activity.
*(If you did **not** do an activity, please write "0" in the boxes)*

		Number of times	Total time in this activity: hours	Total time in this activity: minutes
a	**Walking briskly** (for recreation or exercise, or to get from place to place)	☐☐	☐☐	☐☐
b	**Moderate leisure activity** (like social tennis, moderate exercise classes, recreational swimming, dancing)	☐☐	☐☐	☐☐
c	**Vigorous leisure activity** (that makes you breathe harder or puff and pant like aerobics, competitive sport, vigorous cycling, running, swimming)	☐☐	☐☐	☐☐
d	**Vigorous household or garden chores** (that make you breathe harder or puff and pant)	☐☐	☐☐	☐☐

Now think about all of the time you spend sitting during ***each day*** while at home, at work, while getting from place to place or during your spare time.

Q68 **In total, how much time do you typically spend sitting down while doing things like visiting friends, driving, reading, watching television, or working at a desk or computer?**

a	On a usual **week day**	☐☐	hours	☐☐	minutes
b	On a usual **weekend day**	☐☐	hours	☐☐	minutes

Q69 **Thinking about your current approach to life, please indicate how much you think each statement describes you:**
(Mark one on each line)

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a	In uncertain times, I usually expect the best	☐	☐	☐	☐	☐
b	If something can go wrong for me, it will	☐	☐	☐	☐	☐
c	I'm always optimistic about my future	☐	☐	☐	☐	☐
d	I hardly ever expect things to go my way	☐	☐	☐	☐	☐
e	I rarely count on good things happening to me	☐	☐	☐	☐	☐
f	Overall, I expect more good things to happen to me than bad	☐	☐	☐	☐	☐

Q70 **Over the *last 12 months*, on average, how often did you drink the following?**
(Mark one on each line)

		Never	Less than once per month	1 to 3 times per month	1 time per week	2 times per week	3 to 4 times per week	5 to 6 times per week	1 time per day	2 times per day	3 or more times per day
a	Cola drinks - not diet (eg Coke)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Diet cola drinks (eg Diet Coke™)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c	Other carbonated drinks – not diet (eg fizzy / soft drinks)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d	Other diet carbonated drinks (eg diet lemonade)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e	Non-carbonated cordials, fruit or sport drinks- not diet	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f	Non-carbonated diet cordials, fruit or sport drinks	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g	Milk or soya milk (including flavoured varieties)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h	Fruit or vegetable juices	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
i	Tea	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
j	Herbal tea	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
k	Coffee	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
l	Water (including soda or plain mineral water)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q71 **Do you regularly *need* help with daily tasks because of long-term illness or disability (eg help with personal care, getting around, preparing meals etc)?** *(Mark one only)*

Yes ☐ **No** ☐

Q72 **Do you regularly *provide* unpaid care or assistance *(eg personal care, transport)* to any other person because of their long-term illness, disability or frailty?** *(Mark one on each line)*

		Yes	No	
a	For someone who lives with you	☐	☐	If no to both, **go to Q76**
b	For someone who lives elsewhere	☐	☐	

Q73 **How many people with a long-term illness, disability or frailty do you regularly provide care for?** *(Mark one only)*

- One person ☐
- Two people ☐
- More than two people ☐

Q74 **How often in total do you provide this care or assistance?** *(Mark one only)*

- Every day ☐
- Several times a week ☐
- Once a week ☐
- Once every few weeks ☐
- Less often ☐

Q75 **How much time do you usually spend providing such care or assistance on each occasion?** *(Mark one only)*

- All day and night ☐
- All day ☐
- All night ☐
- Several hours ☐
- About an hour ☐

Q76 **People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kind of support available to you if you need it?**

	(Mark one on each line)	None of the time	A little of the time	Some of the time	Most of the time	All of the time
a	Someone to help you if you are confined to bed	☐	☐	☐	☐	☐
b	Someone you can count on to listen to you when you need to talk	☐	☐	☐	☐	☐
c	Someone to give you good advice about a crisis	☐	☐	☐	☐	☐
d	Someone to take you to the doctor if you need it	☐	☐	☐	☐	☐
e	Someone who shows you love and affection	☐	☐	☐	☐	☐
f	Someone to have a good time with	☐	☐	☐	☐	☐
g	Someone to give you information to help you understand a situation	☐	☐	☐	☐	☐
h	Someone to confide in or talk to about yourself or your problems	☐	☐	☐	☐	☐
i	Someone who hugs you	☐	☐	☐	☐	☐
j	Someone to get together with for relaxation	☐	☐	☐	☐	☐
k	Someone to prepare your meals if you are unable to do it yourself	☐	☐	☐	☐	☐
l	Someone whose advice you really want	☐	☐	☐	☐	☐
m	Someone to do things with to help you get your mind off things	☐	☐	☐	☐	☐
n	Someone to help with daily chores if you are sick	☐	☐	☐	☐	☐
o	Someone to share your most private worries and fears with	☐	☐	☐	☐	☐
p	Someone to turn to for suggestions about how to deal with a personal problem	☐	☐	☐	☐	☐
q	Someone to do something enjoyable with	☐	☐	☐	☐	☐
r	Someone who understands your problems	☐	☐	☐	☐	☐
s	Someone to love and make you feel wanted	☐	☐	☐	☐	☐

Q77	Have you experienced any of the following events? *(Mark all that apply)*	A Yes – In the last 12 months	B Yes – More than 12 months ago
a	Major personal illness	☐	☐
b	Major personal injury	☐	☐
c	Major surgery (not including dental work)	☐	☐
d	Having a child with a disability or serious illness	☐	☐
e	Getting married	☐	☐
f	Divorce	☐	☐
g	Separation	☐	☐
h	Death of partner	☐	☐
i	Death of a parent	☐	☐
j	Death of a child	☐	☐
k	Natural disaster (fire, flood, drought, earthquake etc) or house fire	☐	☐
l	Being robbed	☐	☐
m	Involvement in a serious accident	☐	☐
n	Being pushed, grabbed, shoved, kicked or hit	☐	☐
o	Being forced to take part in unwanted sexual activity	☐	☐
p	**None of these events**	☐	

Q78 In the ***past week***, have you been feeling that life isn't worth living? *(Mark one only)*

Yes ☐ No ☐

Q79 In the ***past 6 months***, have you ***ever*** deliberately hurt yourself or done anything that you knew might have harmed or even killed you? *(Mark one only)*

Yes ☐ No ☐

If you answered yes to either of the last 2 questions, you might like to talk to someone about how you are feeling. You could ring Lifeline on 13 11 14 (local call).

Q80 Below is a list of the ways you might have felt or behaved. Please indicate how often you have felt this way ***during the last week***.
(Mark one on each line)

		Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)
a	I was bothered by things that don't usually bother me	☐	☐	☐	☐
b	I had trouble keeping my mind on what I was doing	☐	☐	☐	☐
c	I felt depressed	☐	☐	☐	☐
d	I felt that everything I did was an effort	☐	☐	☐	☐
e	I felt hopeful about the future	☐	☐	☐	☐
f	I felt fearful	☐	☐	☐	☐
g	My sleep was restless	☐	☐	☐	☐
h	I was happy	☐	☐	☐	☐
i	I felt lonely	☐	☐	☐	☐
j	I could not 'get going'	☐	☐	☐	☐
k	I felt terrific	☐	☐	☐	☐

Q81 Next are some specific questions about your health and how you have been feeling in the ***past month***. *(Mark one on each line)*

		Yes	No
a	Have you felt keyed up or on edge?	☐	☐
b	Have you been worrying a lot?	☐	☐
c	Have you been irritable?	☐	☐
d	Have you had difficulty relaxing?	☐	☐
e	Have you been sleeping poorly?	☐	☐
f	Have you had headaches or neck aches?	☐	☐
g	Have you had any of the following: trembling, tingling, dizzy spells, sweating, diarrhoea or needing to pass urine more often than usual?	☐	☐
h	Have you been worried about your health?	☐	☐
i	Have you had difficulty falling asleep?	☐	☐

Q82 Over the ***last 12 months***, how stressed have you felt about the following areas of your life? *(Mark one on each line)*

		Not applicable	Not at all stressed	Somewhat stressed	Moderately stressed	Very stressed	Extremely stressed
a	Own health	☐	☐	☐	☐	☐	☐
b	Health of family members	☐	☐	☐	☐	☐	☐
c	Work / employment	☐	☐	☐	☐	☐	☐
d	Living arrangements	☐	☐	☐	☐	☐	☐
e	Study	☐	☐	☐	☐	☐	☐
f	Money	☐	☐	☐	☐	☐	☐
g	Relationship with parents	☐	☐	☐	☐	☐	☐
h	Relationship with partner / spouse	☐	☐	☐	☐	☐	☐
i	Relationship with other family members	☐	☐	☐	☐	☐	☐
j	Relationship with friends	☐	☐	☐	☐	☐	☐
k	Motherhood / children	☐	☐	☐	☐	☐	☐

Q83 Have you ever had a partner or spouse? *(Mark one only)*

Yes ☐ **No** ☐ — If no, **go to Q86**

Q84 Have you ever been in a violent relationship with a partner / spouse? *(Mark one only)*

Yes ☐ **No** ☐ **I prefer not to answer** ☐

The following questions ask about difficult situations you may have experienced.
Some people prefer not to answer questions of this nature.
If this is true for you, please go to Question 86.

Q85 **This question asks about situations you may have experienced with *current or past* partners.**
(Mark as many as apply on each line)

	My Partner:	In the last 12 months	More than 12 months ago	Never
a	Told me that I wasn't good enough	☐	☐	☐
b	Kept me from medical care	☐	☐	☐
c	Followed me	☐	☐	☐
d	Tried to turn my family, friends and children against me	☐	☐	☐
e	Locked me in the bedroom	☐	☐	☐
f	Slapped me	☐	☐	☐
g	Forced me to take part in unwanted sexual activity	☐	☐	☐
h	Told me that I was ugly	☐	☐	☐
i	Tried to keep me from seeing or talking to my family	☐	☐	☐
j	Threw me	☐	☐	☐
k	Hung around outside my house	☐	☐	☐
l	Blamed me for causing their violent behaviour	☐	☐	☐
m	Harassed me over the telephone	☐	☐	☐
n	Shook me	☐	☐	☐
o	Harassed me at work	☐	☐	☐
p	Pushed, grabbed or shoved me	☐	☐	☐
q	Used a knife or gun or other weapon	☐	☐	☐
r	Became upset if dinner / housework wasn't done when they thought it should be	☐	☐	☐
s	Told me that I was crazy	☐	☐	☐
t	Told me that no one would ever want me	☐	☐	☐
u	Took my wallet and left me stranded	☐	☐	☐
v	Hit or tried to hit me with something	☐	☐	☐
w	Did not want me to socialise with my female friends	☐	☐	☐
x	Refused to let me work outside the home	☐	☐	☐
y	Kicked me, bit me or hit me with a fist	☐	☐	☐
z	Tried to convince my friends, family or children that I was crazy	☐	☐	☐
aa	Told me that I was stupid	☐	☐	☐
bb	Beat me up	☐	☐	☐

If you feel distressed about any experiences of violence and abuse and would like some help to deal with this, please consider contacting one of the following:
**** Your nearest Women's Health Centre or Community Health Centre***
**** Your General Practitioner for advice about who would be the best person in your community to talk to***
**** A Lifeline counsellor on 13 11 14 (local call).***

Q86 Please read each statement below and indicate how much the statement applied to you ***over the past week***. *(Mark one on each line)*

		Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me to a considerable degree, or a good part of the time	Applied to me very much, or most of the time
a	I was aware of dryness of my mouth	☐	☐	☐	☐
b	I experienced breathing difficulty (eg excessively rapid breathing, breathlessness in the absence of physical exertion)	☐	☐	☐	☐
c	I experienced trembling (eg in the hands)	☐	☐	☐	☐
d	I was worried about situations in which I might panic and make a fool of myself	☐	☐	☐	☐
e	I felt I was close to panic	☐	☐	☐	☐
f	I was aware of the action of my heart in the absence of physical exertion (eg sense of heart rate increase, heart missing a beat)	☐	☐	☐	☐
g	I felt scared without any good reason	☐	☐	☐	☐

The following questions ask about how you use your time.

Q87 **Managing time is often difficult. How often do you feel:**
(Mark one on each line)

		Every day	A few times a week	About once a week	About once a month	Never
a	That you are rushed, pressured, too busy?	☐	☐	☐	☐	☐
b	That you have time on your hands that you don't know what to do with?	☐	☐	☐	☐	☐

Q88 **In a usual week, how much time in total do you spend doing the following things?**
(Mark one on each line)

		I don't do this activity	1-15 hours	16-24 hours	25-34 hours	35-40 hours	41-48 hours	49 hours or more
a	Active leisure (eg walking, exercise, sport)	☐	☐	☐	☐	☐	☐	☐
b	Passive leisure (eg TV, music, reading, relaxation)	☐	☐	☐	☐	☐	☐	☐
c	Full-time permanent paid work	☐	☐	☐	☐	☐	☐	☐
d	Part-time permanent paid work	☐	☐	☐	☐	☐	☐	☐
e	Casual paid work	☐	☐	☐	☐	☐	☐	☐
f	Work without pay (eg family business)	☐	☐	☐	☐	☐	☐	☐
g	Studying	☐	☐	☐	☐	☐	☐	☐
h	Unpaid voluntary work	☐	☐	☐	☐	☐	☐	☐
i	Home duties (own / family home)	☐	☐	☐	☐	☐	☐	☐
j	Looking after your / your partner's children	☐	☐	☐	☐	☐	☐	☐

Q89 **Are you currently unemployed *and actively seeking work*?** *(Mark one only)*

- No ☐
- Yes, unemployed for less than 6 months ☐
- Yes, unemployed for 6 months or more ☐

Q90 **Do you normally do any of the following kinds of paid work?** *(Mark all that apply)*

a	I don't do any paid work	☐	go to Q92
b	Paid shift work	☐	
c	Paid work with irregular hours	☐	
d	Paid work on short-term contract (less than one year)	☐	
e	Paid work in more than one job	☐	
f	Paid work at night	☐	
g	Paid work from home	☐	
h	Self employment	☐	
i	**None of the above**	☐	

Q91 **How secure or insecure do you feel about your paid job or jobs?**
(Mark one only)

- I worry all the time about losing my job ☐
- Sometimes I worry about losing my job ☐
- I rarely or never worry about losing my job ☐
- Don't know ☐

Q92 **Are you happy with the number of hours of paid work you do?**
(Mark one only, even if you have no paid work)

- Yes, happy as is ☐
- No, would like to do more ☐
- No, would like to do less ☐

Q93 **We would like to know your main occupation *now*** *(Mark one only)*

Manager or administrator (eg magistrate, farm manager, general manager, director of nursing, school principal)	☐
Professional (eg scientist, doctor, registered nurse, allied health professional, teacher, artist)	☐
Associate professional (eg technician, manager, youth worker, police officer)	☐
Tradesperson or related worker (eg hairdresser, gardener, florist)	☐
Advanced clerical or service worker (eg secretary, personal assistant, flight attendant, law clerk)	☐
Intermediate clerical, sales or service worker (eg typist, word processing / data entry operator, receptionist, child care worker, nursing assistant, hospitality worker)	☐
Intermediate production or transport worker (eg sewing machinist, machine operator, bus driver)	☐
Elementary clerical, sales or service worker (eg filing / mail clerk, parking inspector, sales assistant, telemarketer, housekeeper)	☐
Labourer or related worker (eg cleaner, factory worker, general farm hand, kitchen hand)	☐
No paid job	☐

Q94 a **What is the average gross (before tax) income that you receive each week, including pensions, allowances and financial support from parents?**

b **What is the average gross (before tax) income of your household each week (eg you and your partner, or you and your parents sharing a house?)**
*(Mark **one** for **yourself** and **one** for your **household**)*

	a. Self	b. Household
No income	☐	☐
$1-$119 ($1-$6,239 annually)	☐	☐
$120-$299 ($6,240-$15,599 annually)	☐	☐
$300-$499 ($15,600-$25,999 annually)	☐	☐
$500-$699 ($26,000-$36,399 annually)	☐	☐
$700-$999 ($36,400-$51,999 annually)	☐	☐
$1,000-$1,499 ($52,000-$77,999 annually)	☐	☐
$1,500-$1,999 ($78,000-$103,999 annually)	☐	☐
$2,000-$2,499 ($104,000-$129,999 annually)	☐	☐
$2,500-$2,999 ($130,000-$155,999 annually)	☐	☐
$3,000 or more ($156,000 or more annually)	☐	☐
Don't know	☐	☐
Don't want to answer	☐	☐
I live alone (household income is the same as mine)		☐

Q95 **How many people (including yourself) are dependent on this household income?** *(Write number in boxes)*

Q96 **How do you manage on the income you have available?** *(Mark one only)*

- It is impossible ☐
- It is difficult all the time ☐
- It is difficult some of the time ☐
- It is not too bad ☐
- It is easy ☐

Q97 **What is the highest qualification you have completed?** *(Mark one only)*

- No formal qualifications ☐
- Year 10 or equivalent (eg School Certificate) ☐
- Year 12 or equivalent (eg Higher School Certificate) ☐
- Trade / apprenticeship (eg hairdresser, chef) ☐
- Certificate / diploma (eg child care, technician) ☐
- University degree ☐
- Higher university degree (eg Grad Dip, Masters, PhD) ☐

Q98 **Which one of the following best describes your housing situation?** *(Mark one only)*

- Private rental (including rent paid to real estate agents) ☐
- State Department of Housing public rental ☐
- Housing that comes with employment (eg Department of Defence, Department of Education, mining company etc) ☐
- Owned home (with or without mortgage) ☐
- Living with parents / in-laws ☐

Q99 **Which of these most closely describes your sexual orientation?** *(Mark one only)*

- I am exclusively heterosexual ☐
- I am mainly heterosexual ☐
- I am bisexual ☐
- I am mainly homosexual (lesbian) ☐
- I am exclusively homosexual (lesbian) ☐
- I don't know ☐
- I don't want to answer ☐

Q100 **What is your present marital status?** *(Mark one only)*

- Never married ☐
- Married ☐
- De facto (opposite sex) ☐
- De facto (same sex) ☐
- Separated ☐
- Divorced ☐
- Widowed ☐

Q101 **Who lives with you?** *(Mark all that apply)*

a	No one, I live alone	☐
b	Partner / spouse	☐
c	Own children	☐
d	Someone else's children	☐
e	Parents	☐
f	Other adults	☐

Q102 **In general, how satisfied are you with what you have achieved in each of the following areas of your life?** *(Mark one on each line)*

		Not applicable	Very satisfied	Satisfied	Dissatisfied	Very dissatisfied
a	Work	☐	☐	☐	☐	☐
b	Career	☐	☐	☐	☐	☐
c	Study	☐	☐	☐	☐	☐
d	Family relationships	☐	☐	☐	☐	☐
e	Partner / closest personal relationship	☐	☐	☐	☐	☐
f	Friendships	☐	☐	☐	☐	☐
g	Social activities	☐	☐	☐	☐	☐
h	Motherhood / children	☐	☐	☐	☐	☐

Q103 What is your date of birth?
(Write date in boxes)

D D M M **19** Y Y

Q104 Did someone help you fill in this survey? *(Mark one only)*

No ☐
Yes, but I told them the answers I wanted ☐
Yes, but the helper answered for me using his / her own judgement ☐

Q105 What was the MAIN reason for your needing help to fill in this survey? *(Please describe)*

_____

Have we missed anything?

If you have anything else you would like to tell us, please write on the lines below. You may also like to take a moment to check you have not missed any questions or pages.

_____
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Thank you for taking the time to complete this survey.

If you need help to answer any of the questions, you can contact us by telephoning 1800 068 081 (Freecall)

When you have completed the survey, please sign the next page and send the survey back to us as soon as possible. We will detach the consent form and store it in a separate locked room.

Consent

I agree to the research team following health and other records relating to me, including hospital and health service use records and cancer registers and other chronic conditions registers as described to me in the accompanying brochure. I also understand this means I agree to Medicare releasing information concerning services provided to me under Medicare, The Department of Veterans' Affairs, the Pharmaceutical Benefits Scheme and the Repatriation Pharmaceutical Benefits Scheme, including past information, for the duration of the study, as outlined in the enclosed letter.
(Mark one only)

Yes ☐ No ☐

Please sign below and send the completed survey back to us in the envelope supplied as soon as possible. We will detach the consent form and store it in a separate locked room.

Signature: _____ **Date:** / /

What is your Maiden Name? *(Please print in the boxes)*

Help us keep in touch

Sometimes we lose touch with our participants. It would be helpful if you could give us your mobile phone number and email address.

Mobile

Email

It would be helpful also, if you could give us details of **parents, a relative or friend** who will be able to help us find you, after checking that the relative or friend is happy for you to provide these details.

Name:

Address:

Town / Suburb _____ State _____ Postcode _____

Phone: ( ) **Relationship to you:**

Name:

Address:

Town / Suburb _____ State _____ Postcode _____

Phone: ( ) **Relationship to you:**

women's health australia

the australian longitudinal study on women's health

Please post this back in the Reply Paid envelope provided.

Please let us know your new details if you move, change your name or your telephone number.

Freecall Number: 1800 068 081

Australian Longitudinal Study on Women's Health
The University of Newcastle, Callaghan NSW 2308
Phone: 02 4913 8872 Fax: 02 4913 8888
Email: whasec@newcastle.edu.au
Web: www.alswh.org.au

Appendix 3 The 45 and Up Study sub-study: Women's self-care strategies for coping and living with chronic illness - Osteoarthritis questionnaire

Draft

saxinstitute

THE 45 AND UP STUDY

Women's self-care strategies for coping and living with chronic illness
Osteoarthritis questionnaire

UTS UNIVERSITY OF TECHNOLOGY, SYDNEY

The ***Women's self-care strategies for coping and living with chronic illness*** research project is being conducted by researchers at the University of Technology Sydney. The aim of the project is to collect information on what women do to improve their health that are outside of conventional medical care (self-care) to better understand how women cope and live with the following chronic illnesses: osteoarthritis, asthma, depression, osteoporosis and diabetes.

This is the osteoarthritis questionnaire. If you have more than one of the chronic conditions listed above we would like you to complete this questionnaire for osteoarthritis. If you do not have osteoarthritis please advise us by contacting the 45 and Up Study on 1300 45 11 45 or by email to 45andUp@saxinstitute.org.au

Participation is completely voluntary. All information that you provide will be kept strictly confidential and will be used for health research only. To participate in the research project, please read the participant information leaflet, then fill in the questionnaire and consent form and return them in the envelope provided.

COMPLETION GUIDELINES

Your answers and experiences are important to us.

Fully shade the appropriate box(es)/circle(s) ● Yes ○ No

To help us read your answers, please write as clearly as possible using a **BLACK** or **DARK BLUE** pen.

Place a cross over any incorrect selection you wish to cancel ● Yes ○ No

Place numbers or CAPITAL letters in appropriate boxes | A | B | C | | 1 | 2 | 3 |

Circles are provided where only one choice is permitted ○
Boxes indicate that multiple responses are permitted □

For written responses, please cross out your incorrect response and write your new response just above or below the one you have crossed out.

INCORRECT
CORRECT

YOUR GENERAL HEALTH

Q1. Please indicate which statements best describe your own health state today.

Mobility *(Choose one only)*

○ I have no problems in walking around
○ I have some problems in walking around
○ I am confined to bed

Personal care *(Choose one only)*

○ I have no problems with personal care
○ I have some problems washing or drying myself
○ I am unable to wash or dress myself

Usual activities (e.g. work, study, housework, family or leisure activities) *(Choose one only)*

○ I have no problems with performing my usual activities
○ I have some problems with performing my usual activities
○ I am unable to perform my usual activities

Pain/discomfort *(Choose one only)*

○ I have no pain or discomfort
○ I have moderate pain or discomfort
○ I have extreme pain or discomfort

Anxiety/depression *(Choose one only)*

○ I am not anxious or depressed
○ I am moderately anxious or depressed
○ I am extremely anxious or depressed

Q2. To help people say how good or bad a health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 10 and the worst state you can imagine is marked 1.

We would like you to indicate on this scale how good or bad your own health is today, in your opinion. Please do this by shading the circle on whichever point on the scale indicates how good or bad your health state is today.

Worst state									Best state
○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9	○ 10

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Q3. Below is a list of ways you might have felt or behaved. Please indicate how often you have felt this way during the last week.

(Choose one on each line)	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)
I was bothered by things that don't usually bother me	O	O	O	O
I had trouble keeping my mind on what I was doing	O	O	O	O
I felt depressed	O	O	O	O
I felt everything I did was an effort	O	O	O	O
I felt hopeful about the future	O	O	O	O
I felt fearful	O	O	O	O
My sleep was restless	O	O	O	O
I was happy	O	O	O	O
I felt lonely	O	O	O	O
I could not "get going"	O	O	O	O
I felt terrific	O	O	O	O

Q4. Please indicate how much you agree or disagree with each of the following statements:

(Choose one on each line)	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
I can avoid illness if I take care of myself	O	O	O	O	O	O
Luck plays a big part in determining how soon I will recover from an illness	O	O	O	O	O	O
I am in control of my health	O	O	O	O	O	O
My good health is largely a matter of good fortune	O	O	O	O	O	O
No matter what I do, if I am going to get sick, I will get sick	O	O	O	O	O	O
The main thing which affects my health is what I do myself	O	O	O	O	O	O
Setting goals for health is realistic	O	O	O	O	O	O
Most things that affect my health happen to me by accident	O	O	O	O	O	O
If I get sick, it is my own behaviour that determines how soon I will get well	O	O	O	O	O	O
I will stay healthy if it's meant to be	O	O	O	O	O	O
No matter what I do, I am likely to get sick	O	O	O	O	O	O
If I take the right actions, I can stay healthy	O	O	O	O	O	O
I can be as healthy as I want to be	O	O	O	O	O	O
I have little influence over my health	O	O	O	O	O	O

Q5. **In the past 12 months, have you been diagnosed or treated by a doctor for any of the following:**
(Choose all that apply)

- ☐ Anxiety/nervous disorder
- ☐ Asthma
- ☐ Cancer (excluding skin cancer)
- ☐ Dementia, Alzheimer's disease
- ☐ Depression
- ☐ Diabetes
- ☐ Heart disease (incl. heart attack, angina)
- ☐ Hypertension
- ☐ Osteoarthritis
- ☐ Osteoporosis
- ☐ Parkinson's disease
- ☐ Stroke
- ☐ Other 1 (specify) ____
- ☐ Other 2 (specify) ____

Q6. **Have you taken or used any prescription medication other than those for your osteoarthritis, prescribed by a doctor/specialist during the past 12 months?**
○ Yes ▼ if Yes, please list ○ No ▶ if No, go to Question 7

1.	**4.**
2.	**5.**
3.	**6.**

PHYSICAL ACTIVITY

Q7. **How many *times* did you do each type of activity last week (Monday to Sunday)? If you add up all the times you spent in each activity last week, how much time did you spend altogether doing each type of activity?**

Only count the number of times when the activity lasted for 10 minutes or more. (If you did not do an activity, please write "0" in the box)	Number of times in last week	Time spent altogether hours	minutes
Walking briskly *(for recreation or exercise, or to get from place to place)*	☐☐	☐☐ :	☐☐
Moderate leisure activity *(like social tennis, moderate exercise classes, recreational swimming, dancing)*	☐☐	☐☐ :	☐☐
Vigorous leisure activity *(that makes you breathe harder or puff and pant like aerobics, competitive sport, vigorous cycling, running, swimming)*	☐☐	☐☐ :	☐☐
Vigorous household or garden chores *(that make you breathe harder or puff and pant)*	☐☐	☐☐ :	☐☐

SMOKING AND TOBACCO

Q8. **How often do you currently smoke cigarettes or any tobacco products?** *(Choose one only)*
○ Daily ▶ go to Question 9
○ At least weekly (but not daily) ▶ go to Question 10
○ Less often than weekly ▶ go to Question 11
○ Not at all ▶ go to Question 13

Q9. **If you smoke daily, on average how many cigarettes do you smoke each day?**
☐☐ cigarettes per day ▶ go to Question 13

Q10. **If you smoke, but not daily, on average how many cigarettes do you smoke per week?**
☐☐☐ cigarettes per week

Q11. **Have you ever smoked daily?**
○ Yes ▼ ○ No ▶ if No, go to Question 13

Q12. **At what age did you finally stop smoking daily?**
☐☐ years old

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ALCOHOL AND DRINKING

Q13. Do you drink alcohol? *(Choose one only)*
- O I have never drunk alcohol in my life ▶ go to Question 17
- O I never drink alcohol, but I have in the past ▶ go to Question 17
- O Yes

Q14. How many alcoholic drinks do you have each week?
One drink = a small glass of wine, middy of beer or nip of spirits *(put "0" if you do not drink, or have less than one drink each week).*

☐☐ number of alcoholic drinks each week

Q15. On how many days each week do you usually drink alcohol?

☐ days each week

Q16. How often do you have four or more drinks of alcohol on one occasion? *(Choose one only)*
O Never O Less than once a month O About once a month O About once a week O More than once a week

SLEEP

Q17. How long did it usually take for you to fall asleep during the past 4 weeks? *(Choose one only)*
O 0 - 15 minutes O 16 - 30 minutes O 31 - 45 minutes O 46 - 60 minutes O More than 60 minutes

Q18. On average, how many hours did you sleep each night during the past 4 weeks?

☐☐ hours per night

Q19. How often during the past 4 weeks did you...

(Choose one on each line)	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
Feel that your sleep was not quiet (moving restlessly, feeling tense, speaking, etc. while sleeping)?	O	O	O	O	O	O
Get enough sleep to feel rested upon waking in the morning?	O	O	O	O	O	O
Awaken short of breath or with a headache?	O	O	O	O	O	O
Feel drowsy or sleepy during the day?	O	O	O	O	O	O
Have trouble falling asleep?	O	O	O	O	O	O
Awaken during your sleep time and have trouble falling asleep again?	O	O	O	O	O	O
Have trouble staying awake during the day?	O	O	O	O	O	O
Snore during your sleep?	O	O	O	O	O	O
Take naps (5 minutes or longer) during the day?	O	O	O	O	O	O
Get the amount of sleep you needed?	O	O	O	O	O	O

HEIGHT AND WEIGHT

Q20. How much do you weigh? *(No clothes or shoes)*
kg ☐☐☐ OR stone ☐☐ lbs ☐☐

Q21. How tall are you without shoes?
cm ☐☐☐ OR feet ☐ inches ☐☐

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YOUR OSTEOARTHRITIS

Q22. How long is it since you were first diagnosed with osteoarthritis? *(Please specify number of years/months)* ☐☐ years ☐☐ months

Q23. How would you rate the severity of your osteoarthritis during the past 12 months?

Least severe									Most severe
O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9	O 10

Q24. How would you rate the severity of your osteoarthritis in the past 4 weeks?

Least severe									Most severe
O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9	O 10

MEDICAL/ALLIED HEALTH PROFESSIONAL VISITS

Q25. Did you consult with any of the health practitioners listed below for your osteoarthritis during the past 12 months?

O Yes ▼ O No ▶ if No, go to Question 29

If Yes, how many times did you consult with the following practitioners?

(Choose one on each line as relevant)	1 or 2	3 - 6	7 or more
General practitioner	O	O	O
Medical specialist	O	O	O
Hospital doctor	O	O	O
Nurse	O	O	O
Pharmacist/chemist	O	O	O
Counsellor	O	O	O
Psychologist	O	O	O
Dietitian	O	O	O
Physiotherapist	O	O	O
Occupational therapist	O	O	O

Q26. How much did it cost you in total for these consultations during the past 12 months? *(Choose one only)*

O Up to $100 O $100 - $499 O $500 - $999 O $1,000 - $1,499 O $1,500 or above

Q27. Have you taken any prescription medication for your osteoarthritis during the past 12 months prescribed by a doctor/specialist?

O Yes ▼ if Yes, please list O No ▶ if No, go to Question 29

	Did you find this medication effective?			Did this medication have unmanageable, ongoing side-effects?		
	Yes	No	Don't know	Yes	No	Don't know
1.	O	O	O	O	O	O
2.	O	O	O	O	O	O
3.	O	O	O	O	O	O
4.	O	O	O	O	O	O
5.	O	O	O	O	O	O

Q28. How much did it cost you in total for these medications listed in Question 27 during the past 12 months? *(Choose one only)*

O Up to $100 O $100 - $499 O $500 - $999 O $1,000 - $1,499 O $1,500 or above

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COMPLEMENTARY HEALTH PRACTITIONER VISITS

Q29. Did you consult with any complementary health practitioners listed below for your osteoarthritis during the past 12 months?

O Yes ▼ O No ▶ if No, go to Question 31

If Yes, how many times did you consult with the following practitioners during the past 12 months?

(Choose one on each line as relevant)	1 or 2	3 - 6	7 or more
Acupuncturist	O	O	O
Chiropractor	O	O	O
Naturopath/herbalist	O	O	O
Homeopath	O	O	O
Massage therapist	O	O	O
Meditation instructor	O	O	O
Yoga instructor	O	O	O
Nutritionist	O	O	O
Osteopath	O	O	O
Traditional Chinese medicine practitioner	O	O	O
Other (please specify)	O	O	O

Q30. How much did it cost you in total for these consultations during the past 12 months? *(Choose one only)*

O Up to $100 O $100 - $499 O $500 - $999 O $1,000 - $1,499 O $1,500 or above

USE OF COMPLEMENTARY HEALTH PRODUCTS/PRACTICES

Q31. Did you use any complementary health products or practices listed below for your osteoarthritis during the past 12 months?

O Yes ▼ O No ▶ if No, go to Question 37

If Yes, how many times did you take/use them during the past 12 months?

(Choose one on each line as relevant)	At least once daily	At least weekly	At least monthly
Aromatherapy oils	O	O	O
Herbal medicines	O	O	O
Homeopathic remedies	O	O	O
Meditation by yourself (i.e. without instructor)	O	O	O
Yoga by yourself (i.e. without instructor)	O	O	O
Physical activities/exercises	O	O	O
Multivitamins	O	O	O
Glucosamine/chondroitin	O	O	O
Fish oil	O	O	O
Other 1. (please specify)	O	O	O
Other 2. (please specify)	O	O	O

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Q32. Did any of the following health practitioners recommend the following complementary health products or practices for your osteoarthritis during the past 12 months? Are any of the health practitioners monitoring/ managing your ongoing use of these products or practices?

(Choose one option for 'Recommend' and one option for 'Monitor' on each line as relevant)	Medical practitioner (e.g. GP, respiratory specialist)		Allied health practitioner (e.g. physiotherapist, pharmacist)		Complementary health practitioner (e.g. naturopath, acupuncturist)	
	Recommend	Monitor	Recommend	Monitor	Recommend	Monitor
Aromatherapy oils	☐	☐	☐	☐	☐	☐
Herbal medicines	☐	☐	☐	☐	☐	☐
Homeopathic remedies	☐	☐	☐	☐	☐	☐
Meditation by yourself (i.e. without instructor)	☐	☐	☐	☐	☐	☐
Yoga by yourself (i.e. without instructor)	☐	☐	☐	☐	☐	☐
Physical activities/exercises	☐	☐	☐	☐	☐	☐
Multivitamins	☐	☐	☐	☐	☐	☐
Glucosamine/chondroitin	☐	☐	☐	☐	☐	☐
Fish oil	☐	☐	☐	☐	☐	☐
Other 1 (as specified in Q31)	☐	☐	☐	☐	☐	☐
Other 2 (as specified in Q31)	☐	☐	☐	☐	☐	☐

Q33. Where did you purchase the following complementary health products that you used for your osteoarthritis, during the past 12 months?

(Choose all that apply)	Supermarket/ health food store	Pharmacy/ chemist	Complementary health practitioner	Internet
Aromatherapy oils	☐	☐	☐	☐
Herbal medicines	☐	☐	☐	☐
Homeopathic remedies	☐	☐	☐	☐
Multivitamins	☐	☐	☐	☐
Glucosamine/chondroitin	☐	☐	☐	☐
Fish oil	☐	☐	☐	☐
Other 1 (as specified in Q31)	☐	☐	☐	☐
Other 2 (as specified in Q31)	☐	☐	☐	☐

Q34. How much did it cost you in total for these products and practices during the past 12 months?
(Choose one only)

○ Up to $100 ○ $100 - $499 ○ $500 - $999 ○ $1,000 - $1,499 ○ $1,500 or above

Q35. How effective did you find the following complementary health products and practices for the relief of symptoms associated with your osteoarthritis?

(Choose one on each line as relevant)	Effective	Somewhat effective	Not at all effective
Aromatherapy oils	○	○	○
Herbal medicines	○	○	○
Homeopathic remedies	○	○	○
Meditation by yourself (i.e. without instructor)	○	○	○
Yoga by yourself (i.e. without instructor)	○	○	○
Physical activities/exercises	○	○	○
Multivitamins	○	○	○
Glucosamine/chondroitin	○	○	○
Fish oil	○	○	○
Other 1 (as specified in Q31)	○	○	○
Other 2 (as specified in Q31)	○	○	○

Draft

Q36. Did you talk to any of the following health practitioners about your use of these complementary health products or practices for your osteoarthritis?

(Please choose all that apply)	**Medical practitioner** (e.g. GP, respiratory specialist)	**Allied health practitioner** (e.g. physiotherapist, pharmacist)	**Complementary health practitioner** (e.g. naturopath, acupuncturist)
Aromatherapy oils	☐	☐	☐
Herbal medicines	☐	☐	☐
Homeopathic remedies	☐	☐	☐
Meditation by yourself (i.e. without instructor)	☐	☐	☐
Yoga by yourself (i.e. without instructor)	☐	☐	☐
Physical activities/exercises	☐	☐	☐
Multivitamins	☐	☐	☐
Glucosamine/chondroitin	☐	☐	☐
Fish oil	☐	☐	☐
Other 1 (as specified in Q31)	☐	☐	☐
Other 2 (as specified in Q31)	☐	☐	☐

SOURCES OF INFORMATION ABOUT COMPLEMENTARY HEALTH CARE

Q37. Apart from professional advice, have any of the following information sources been influential in your decision to use complementary health products and/or practitioners for your osteoarthritis?

○ I did not use complementary health products and/or practitioners ▶ go to Question 38

(Choose one on each line as relevant)	**Not influential**	**Moderately influential**	**Very influential**
Family or relatives	○	○	○
Friends or colleagues	○	○	○
Website or internet blog	○	○	○
Facebook or Twitter	○	○	○
Manufacturer's website or helpline	○	○	○
Book	○	○	○
Mass media (e.g. newspaper, TV, magazine, radio)	○	○	○
Scientific literature (medical journal)	○	○	○
Telephone helpline	○	○	○
Self-help or support group	○	○	○

ABOUT YOU

Q38. Do you have private health insurance?

○ Yes ▼ ○ No ▶ if No, go to Question 39

If Yes, does your policy give you a rebate for any of the following? *(Choose all that apply)*

☐ GP ☐ Acupuncturist ☐ Massage therapist ☐ Meditation classes
☐ Medical specialist ☐ Herbalist/Naturopath ☐ Osteopath ☐ Gym membership/ exercise classes
☐ Chiropractor ☐ Physiotherapist ☐ Yoga

Q39. How confident are you filling out medical forms by yourself? *(Choose one only)*

○ Extremely ○ Quite a bit ○ Somewhat ○ A little bit ○ Not at all

Q40. What is the highest qualification you have completed? *(Choose the most appropriate)*

○ No school certificate or other qualifications
○ School or intermediate certificate (or equivalent)
○ Higher school or leaving certificate (or equivalent)
○ Trade/apprenticeship (e.g. hairdresser, chef)
○ Certificate/diploma (e.g. child care, technician)
○ University degree or higher

Q41. What best describes your current situation? *(Choose one only)*

○ Single ○ Married ○ De facto/living with a partner ○ Widowed ○ Divorced ○ Separated

Q42. How do you manage on the income you have available? *(Choose one only)*

○ It is impossible ○ It is difficult all the time ○ It is difficult some of the time ○ It is not too bad ○ It is easy

Draft

Please return your questionnaire AND the signed consent form in the reply paid envelope or post (no stamp required) to:
The 45 and Up Study, Women's Self-Care Strategies Project, Reply Paid 1005, BROADWAY NSW 2007
Infoline 1300 45 11 45 **Email** 45andUp@saxinstitute.org.au

Appendix 4 *SurveyGizmo* questionnaire

Treating people with arthritis in traditional Chinese medicine: an examination of the perceptions of traditional Chinese medicine practitioners.

Practitioner Characteristics

1. **What is your age in years?**

2. **What is your gender?**

- ○ Male
- ○ Female

3. **Which of the following best describes your ethnicity?**

- ○ Asian
- ○ White/Caucasian
- ○ Other, please specify

Practitioner Characteristics

4. **Do you have an acupuncture qualification?**

- ○ No
- ○ Yes

What is your highest level of qualification in acupuncture?

- ○ Diploma
- ○ Bachelor Degree
- ○ Master Degree
- ○ PhD
- ○ Other, please specify

5. Do you have a Chinese herbal medicine qualification?

- ○ No
- ○ Yes

What is your highest level of qualification in Chinese herbal medicine?

- ○ Diploma
- ○ Bachelor Degree
- ○ Master Degree
- ○ PhD
- ○ Other, please specify

6. Have you received any acupuncture training in China?

- ○ No
- ○ Yes

7. **Have you received any traditional herbal medicine training in China?**

- ○ No
- ○ Yes

Practice Characteristics

8. **Do you practice in more than one location?**

- ○ No
- ○ Yes, how many locations in total:

9. **In which State/Territory do you practice? (select all that apply)**

- ☐ ACT
- ☐ NSW
- ☐ VIC
- ☐ QLD
- ☐ WA
- ☐ SA
- ☐ TAS
- ☐ NT

10. **Which of the following best describes your practice location(s)? (select all that apply)**

- ☐ Urban
- ☐ Rural
- ☐ Remote

11. **Please indicate all other health professionals working in your practice location(s) (select all that apply)**

- ☐ None
- ☐ Another acupuncturist
- ☐ Another Chinese herbal medicine practitioner
- ☐ GP
- ☐ Medical specialist
- ☐ Occupational therapist
- ☐ Osteopath
- ☐ Psychologist/Counsellor
- ☐ Physiotherapist
- ☐ Massage therapist
- ☐ Naturopath
- ☐ Chiropractor
- ☐ Other(s), please specify

Clinical Management Regarding Arthritis

12. **Please indicate the frequency with which you REFER your patients with arthritis to any of the following practitioners:**

	Never	Rarely	Sometimes	Often
GP	○	○	○	○
Medical specialist	○	○	○	○
Psychologist/Counsellor	○	○	○	○
Occupational therapist	○	○	○	○
Physiotherapist	○	○	○	○
Naturopath	○	○	○	○
Chiropractor	○	○	○	○
Osteopath	○	○	○	○
Another Chinese herbal medicine practitioner	○	○	○	○
Another acupuncturist	○	○	○	○
Enter another option	○	○	○	○

Clinical Management Regarding Arthritis

13. **Please indicate the frequency with which you RECEIVE the referrals of patients with arthritis from any of the following practitioners**

	Never	Rarely	Sometimes	Often
GP	○	○	○	○
Medical specialist	○	○	○	○
Psychologist/Counsellor	○	○	○	○
Occupational therapist	○	○	○	○
Physiotherapist	○	○	○	○
Naturopath	○	○	○	○
Chiropractor	○	○	○	○
Osteopath	○	○	○	○
Another Chinese herbal medicine practitioner	○	○	○	○
Another acupuncturist	○	○	○	○
Enter another option	○	○	○	○

Clinical Management Regarding Arthritis

14. **With regards to patients with arthritis, how many of the following do you provide on average, per week?**

Patient care hours

Patient visits

15. **With regards to patients with arthritis, how many treatment consultations do you provide on average per patient?**

16. **Do you typically explain arthritic symptoms and/or conditions to your patients with arthritis?**

No
Yes

If no, why not?

- I don't have time
- I don't think it is necessary
- Other (s), please specify:

If yes, how do you explain the arthritic symptoms and/or conditions to your patients with arthritis?

- Using traditional Chinese medical theory
- Using Western medical theory
- Using both Chinese medical and Western medical theories
- Other(s), please specify:

Clinical Management Regarding Arthritis

17. **Please indicate the frequency with which you employ the following treatments in your management of patients with arthritis?**

	Never	Rarely	Sometimes	Often
Acupuncture only	○	○	○	○
Chinese herbal medicine only (oral and/or external use)	○	○	○	○
Both acupuncture and Chinese herbal medicine	○	○	○	○
Enter another option	○	○	○	○

18. **Are you aware of any of your patients with arthritis using any other treatment(s) (traditional Chinese medicine and/or Western medicine) for their symptoms of arthritis?**

- ○ No
- ○ Yes, please specify the treatment(s):

19. **Do you typically ask your patients with arthritis whether they are using any other treatment(s) (traditional Chinese medicine/Western medicine) for their symptoms of arthritis?**

- ○ No
- ○ Yes

Clinical Management Regarding Arthritis

20. Which of the following arthritic conditions do you treat primarily with acupuncture as the main therapy? (select all that apply)

- ☐ Rheumatoid arthritis
- ☐ Osteoarthritis
- ☐ Psoriatic arthritis
- ☐ Gout
- ☐ Other arthritis, please specify:
- ☐ I do not treat any arthritic conditions with acupuncture

21. To what extent do you agree with the following statements?

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Acupuncture is effective for treating rheumatoid arthritis	○	○	○	○	○
Acupuncture is effective for treating osteoarthritis	○	○	○	○	○
Acupuncture is effective for treating psoriatic arthritis	○	○	○	○	○
Acupuncture is effective for treating gout	○	○	○	○	○
Acupuncture is effective for treating other arthritis (the one you specified previously)	○	○	○	○	○
Acupuncture is effective for treating all types of arthritis	○	○	○	○	○
Acupuncture is effective for reducing pain associated with arthritis	○	○	○	○	○
Acupuncture is effective for reducing swelling associated with arthritis	○	○	○	○	○

22. Which of the following arthritic conditions do you treat primarily with Chinese herbal medicine as the main therapy? (select all that apply)

- ☐ Rheumatoid arthritis
- ☐ Osteoarthritis
- ☐ Psoriatic arthritis
- ☐ Gout
- ☐ Other arthritis, please specify:
- ☐ I do not treat any arthritic conditions with Chinese herbal medicine

23. **To what extent do you agree with the following statements?**

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Chinese herbal medicine is effective for treating rheumatoid arthritis	○	○	○	○	○
Chinese herbal medicine is effective for treating osteoarthritis	○	○	○	○	○
Chinese herbal medicine is effective for treating psoriatic arthritis	○	○	○	○	○
Chinese herbal medicine is effective for treating gout	○	○	○	○	○
Chinese herbal medicine is effective for treating other arthritis (the one you specified previously)	○	○	○	○	○
Chinese herbal medicine is effective for treating all types of arthritis	○	○	○	○	○
Chinese herbal medicine is effective for reducing pain associated with arthritis	○	○	○	○	○
Chinese herbal medicine is effective for reducing swelling associated with arthritis	○	○	○	○	○

Clinical Management Regarding Arthritis

24. **Please indicate the frequency with which you discuss the following as part of your care/management plan with patients with arthritis:**

	Never	Rarely	Sometimes	Often
Diet/Nutrition	○	○	○	○
Smoking/Drugs/Alcohol	○	○	○	○
Physical Activity/Fitness	○	○	○	○
Ergonomic advice	○	○	○	○
Pain counselling	○	○	○	○
Nutritional supplements (including vitamins, minerals, herbs)	○	○	○	○
Medications (including for pain/inflammation)	○	○	○	○
Qi Gong/Tai Chi	○	○	○	○
Warming plaster/Patches	○	○	○	○
Moxa	○	○	○	○
Enter another option	○	○	○	○

Appendix 5 Ethics approval letter

UTS HREC Letter of Noting

Research.Ethics@uts.edu.au <Research.Ethics@uts.edu.au> 3 June 2015 at 14:45
To: Lu.Yang-1@student.uts.edu.au, David.Sibbritt@uts.edu.au, Jon.Adams@uts.edu.au, Research.Ethics@uts.edu.au

Dear Applicant,

The Faculty has considered your Nil/Negligible Risk Declaration Form for your project titled, "A Public Health Examination Of Traditional Chinese Medicine Use Amongst Australian Women", and agree your research does not require review from the UTS Human Research Ethics Committee. Please keep a copy of your Declaration form on file to show you have considered risk.

For tracking purposes, you have been provided with an ethics application number, which is UTS HREC 2015000249.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

You should consider this your official letter of noting.

Instructions for saving the declaration form can be downloaded from: http://www.research.uts.edu.au/policies/restricted/human/forms.html#instructions
To access this application, please follow the URLs below:
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* if accessing outside of UTS network: https://remote.uts.edu.au , and click on "RMENet - ResearchMaster Enterprise" after logging in.

If you or anyone connected with this research have any queries please do not hesitate to contact Research.Ethics@uts.edu.au

Yours sincerely,

Professor Marion Haas
Chairperson
UTS Human Research Ethics Committee
C/- Research & Innovation Office
University of Technology, Sydney
E: Research.Ethics@uts.edu.au
I: http://www.research.uts.edu.au/policies/restricted/ethics.html
P: PO Box 123, BROADWAY NSW 2007
[Level 14, Building 1, Broadway Campus]
CB01.14.08.04

REF: E28

From: Research.Ethics@uts.edu.au
Sent: Thursday, 11 May 2017 3:23 PM
To: Lu.Yang@uts.edu.au; Jon.Adams@uts.edu.au; David.Sibbritt@uts.edu.au; Wenbo.Peng@uts.edu.au; Research.Ethics@uts.edu.au
Subject: UTS HREC Letter of Noting - ETH17-1451

Dear Applicant,

The Faculty has considered your Nil/Negligible Risk Declaration Form for your project titled, "Characteristics of Australian women who use acupuncture for their osteoarthritis", and agree your research does not require review from the UTS Human Research Ethics Committee. Please keep a copy of your Declaration form on file to show you have considered risk.

For tracking purposes, you have been provided with an ethics application number, which is UTS HREC ETH17-1451.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

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If you or anyone connected with this research have any queries please do not hesitate to contact Research.Ethics@uts.edu.au

Yours sincerely,

Associate Professor Beata Bajorek
Chairperson
UTS Human Research Ethics Committee
C/- Research & Innovation Office
University of Technology, Sydney
E: Research.Ethics@uts.edu.au
https://staff.uts.edu.au/topichub/Pages/Researching/Research%20ethics/Human%20research%20ethics/human-research-ethics.aspx
PO Box 123, BROADWAY NSW 2007
[Level 14, Building 1, Broadway Campus]

REF: E28

UTS HREC Approval - ETH16-0631

Research.Ethics@uts.edu.au <Research.Ethics@uts.edu.au> 7 July 2016 at 12:38
To: Lu.Yang-1@student.uts.edu.au, David.Sibbritt@uts.edu.au, Jon.Adams@uts.edu.au, Wenbo.Peng@uts.edu.au, Research.Ethics@uts.edu.au

Dear Applicant

The UTS Human Research Ethics Committee reviewed your application titled, "A survey of traditional Chinese medicine practitioners' perception on arthritis", and agreed that the application meets the requirements of the NHMRC National Statement on Ethical Conduct in Human Research (2007). I am pleased to inform you that ethics approval is now granted.

Your approval number is UTS HREC REF NO. ETH16-0631
Approval will be for a period of five (5) years from the date of this correspondence subject to the provision of annual reports.

Your approval number must be included in all participant material and advertisements. Any advertisements on the UTS Staff Connect without an approval number will be removed.

Please note that the ethical conduct of research is an on-going process. The National Statement on Ethical Conduct in Research Involving Humans requires us to obtain a report about the progress of the research, and in particular about any changes to the research which may have ethical implications. This report form must be completed at least annually from the date of approval, and at the end of the project (if it takes more than a year). The Ethics Secretariat will contact you when it is time to complete your first report.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

You should consider this your official letter of approval. If you require a hardcopy please contact Research.Ethics@uts.edu.au.

To access this application, please follow the URLs below:
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* if accessing outside of UTS network: https://remote.uts.edu.au , and click on "RM6 - ResearchMaster Enterprise" after logging in.

We value your feedback on the online ethics process. If you would like to provide feedback please go to:
http://surveys.uts.edu.au/surveys/onlineethics/index.cfm

If you have any queries about your ethics approval, or require any amendments to your research in the future, please do not hesitate to contact Research.Ethics@uts.edu.au.

Yours sincerely,

Professor Marion Haas
Chairperson
UTS Human Research Ethics Committee
C/- Research & Innovation Office
University of Technology, Sydney
E: Research.Ethics@uts.edu.au

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