

The use of complementary and alternative medicine for back pain by women aged 60-65 years across Australia: A health services research study.

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Certificate of original authorship

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

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Date: July 1st 2016

Statement of contributions to jointly authored works contained in the thesis

The results from this thesis have been submitted for publication in peer-reviewed journals through five articles (one integrative literature review paper and four discrete original articles), presented in Chapter 2, Chapter 4, Chapter 5, Chapter 6 and Chapter 7. For each of these papers, I have been primarily responsible for determining the research question, undertaking the analysis and drafting the manuscript.

Support in all of these areas has been provided by Professor David Sibbritt and Professor Jon Adams. Professor Alex Broom, Ms Emma Kirby, Ms Kathryn M Refshauge and Ms Jane Frawely have also assisted in final stages of manuscript drafting as needed.

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

Published works by the author incorporated into the thesis

Of the drafted manuscripts contained in this thesis, all have been published. The list of published papers contained in this thesis is as follows:

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2. Murthy V, Sibbritt D, Adams J, Broom A, Kirby E, Refshauge KM. Consultations with complementary and alternative medicine practitioners amongst wider care options for back pain: a study of a nationally representative sample of 1,310 Australian women aged 60-65 years. *Clinical Rheumatology* 2013; 33 (2): 253-262.
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5. Murthy V, Adams J, Broom A, Kirby E, Refshauge KM, Sibbritt D. The influence of communication and information sources upon decision-making around complementary and alternative medicine use for back pain among Australian women aged 60-65 years. *Health and Social Care in the community* 2015; doi.10.1111/hsc.12275.

Published conference abstracts

1. Murthy, V., Sibbritt D, Adams J (2013). Health Care Utilisation by Back Pain Sufferers who consult Herbalists: a study from a nationally representative sample of 1,310 Australian women. International Congress on Complementary Medicine Research. 2013, London, UK, 11-13 April 2013.

2. Murthy, V., Sibbritt D, Adams J (2014). How do women's attitudes towards complementary and alternative medicine (CAM) influence their choice of self-prescribed herbal medicines for back pain? International Congress on Naturopathic Medicine. 2014, Paris, France, 4-6 July 2014.

Abbreviations

AHPRA - The Australian Health Practitioner Regulation Agency

AHSR - The Association for Health Services Research

AIHW - Australian Institute of Health and Welfare

ALSWH - Australian Longitudinal Study on Women's Health

ANPA - Australian Naturopathic Practitioners Association

ANTA - Australian Natural Therapists Association

ARC - Australian Research Council

ARCCIM - Australian Research Centre in Complementary and Integrative Medicine

ASGC - Australian Standard Geographical Classification

ATMS - Australian Traditional Medicine Society

BP - Back pain

CAM - Complementary and Alternative Medicine

CT - Computerised tomography

DLPA - DL-Phenylalanine

FNTT - Federation of Natural and Traditional Therapists

GMP - Good Manufacturing Practice

GPs - General Practitioners

HIC - The National Health Insurance Commission

HIV - Human immunodeficiency virus

HSR – Health Services Research

IBS - Irritable Bowel Syndrome

LBP - Low back pain

MACCAH - The Ministerial Advisory Committee for Complementary and Alternative Health

NCCAM - National Centre for Complementary and Alternative Medicine

NHAA - National Herbalists Association of Australia

NHMRC - National Health and Medical Research Council

NMBA - Nursing and Midwifery Board of Australia

Non-specific LBP - Non-specific low back pain

NSAIDs - Non-steroidal anti-inflammatory drugs

OTC - Over-the-counter

RCCM - Research Council for Complementary Medicine

RCTs – Randomised Controlled Trials

Specific LBP – Specific low back pain

TGA - Therapeutic Goods Administration

TMS - Transcranial magnetic stimulation

UK – United Kingdom

US – United States of America

WHO - World Health Organization

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Abstract

Background: Back pain is the most prevalent of musculoskeletal conditions internationally and in Australia with women reporting back pain more frequently than men. Women are higher users of health services than men more generally and tend to use complementary and alternative medicine (CAM) frequently for musculoskeletal conditions. Despite debate around evidence for CAM regarding back pain, CAM is commonly used by back pain sufferers. However, there remain important gaps in our understanding of women's consultation patterns with CAM practitioners and self-prescribed CAM treatments for back pain.

Methods: The study utilised a Health Services Research (HSR) approach. The sample for the research reported in this thesis was obtained from a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). In the baseline ALSWH survey (year 1996), women were randomly selected for the study in three age groups, 18-23 years (young cohort), 45-50 years (mid-age cohort) and 70-75 years (older cohort) from the national Medicare database. For the sub-study that this thesis is based on, the participants were chosen from the mid-age cohort of women, who had indicated in the sixth ALSWH survey (2010) that they had experienced back pain. Of the 10,011 women who responded to the sixth ALSWH survey, 1,851 indicated they had experienced back pain and these women were mailed a 50-item sub-study questionnaire. Subsequently 1,620 women were deemed eligible for participating in the sub-study as they confirmed that they had back pain at the time of the sub-study (2011) and 1,310 (80.9%) women returned the completed questionnaire. Alongside the women's demographics, the survey explored the women's patterns of consultations with CAM practitioners and self-prescribed CAM treatments, the women's attitudes toward CAM, the influence of different information sources and communication on the women's decision-making regarding their use of CAM for back pain. The analyses included Pearson chi-square tests to compare categorical variables and t-tests to compare continuous and categorical variables. Multiple logistic regression models, with backwards-stepwise regression, were employed to determine the significant factors associated with CAM use.

Results: A significant number of women consulted a CAM practitioner (76.4%, n=1,001) and/or self-prescribed CAM treatment (75.2%, n=985) for back pain in the previous twelve months. The most commonly consulted CAM practitioners were massage therapist, chiropractor, acupuncturist, herbalist/naturopath, meditation/yoga practitioner, osteopath and the most commonly self-prescribed CAM treatments were supplements, vitamins/minerals, yoga/meditation, herbal medicines and aromatherapy oils. Women's attitudes toward CAM as providing greater control over their body/health, perceiving CAM as natural or promoting a holistic approach to health had a significant influence on their choice of CAM for back pain. Women's decisions on CAM use for back pain were influenced by professional information sources (e.g., doctors; 43%, CAM practitioner; 30%, pharmacist; 20%) as well as non-professional information sources (e.g., friends/colleagues; 39%, family/relatives; 36%, Internet; 6%). Information sources used by women for their decision-making on CAM use differed according to their symptoms. While non-professional information sources positively influenced women in their decision to use CAM for a range of back pain related symptoms, doctors and allied health workers negatively influenced women in their decision to consult a CAM practitioner for a range of back pain related symptoms. Of the women who used CAM for their back pain, 20% consulted their GP prior to using CAM and 34% always informed their GP following CAM use.

Conclusion: This study gives insights for health care providers and policy makers on the range of CAM treatments used by back pain sufferers. Conventional medical practitioners and CAM practitioners should be aware of back pain sufferers' decision-making regarding a range of CAM treatments and be prepared to communicate with patients on safe and effective CAM treatments for back pain. The study highlights a need for further research to examine this topic more closely, and to develop policy in relation to CAM use in back pain.

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1 Background

1.1 Chapter introduction

In this chapter, a background for the thesis will be provided by contextualising the research within the field of Health Services Research (HSR) as the overarching framework for examining women's use of Complementary and Alternative Medicine (CAM) for back pain. This chapter will define key topics and the scope of this work by considering contemporary definitions within the field of HSR on the topic of CAM use. Further, this chapter will identify the research aims, objectives and the related research questions of the study. This chapter will also outline the structure for the following thesis chapters.

1.2 The examination of complementary and alternative medicine: a health services research approach

The increasing popularity of complementary and alternative medicine, as witnessed by the recent growth in CAM use in developed countries (Harris, P. & Rees, 2000), has resulted in a significant increase in research on CAM (Adams et al., 2012). Within the increasing number of approaches to researching CAM, especially through experimental and clinical studies, health services research (HSR) has gained an important place in the critical investigation of CAM (Adams et al., 2012). This thesis will investigate CAM use for back pain by adopting an HSR perspective. This section outlines a broad definition of HSR, the role and application of HSR in CAM research, and describes the significance of examining CAM use using an HSR approach. The section outlines the application of HSR in looking at women's use of CAM in general, and for examining women's use of CAM for back pain.

1.2.1 Current approaches to complementary and alternative medicine research

CAM has become a progressively important topic of research in recent years (Nahin & Straus, 2001) and has gained much attention from researchers across multiple

disciplines of scientific enquiry (Adams, 2007). This pronounced increase in CAM research can be seen through the sheer number of original articles on aspects of CAM in medical and mainstream health care journals (Adams, 2007; Fontanarosa, 2001) and peer-reviewed journals dedicated specifically to providing critical and objective information on CAM such as *BMC Complementary and Alternative Medicine* and *Complementary Therapies in Medicine*. Contemporary research on CAM takes diverse approaches, representing a vast array of disciplinary perspectives involving multiple methods of scientific enquiry depending on the focus of the study – these include therapeutic efficacy, pathogenic mechanisms or health-care utilisation (Adams et al., 2012).

The various methods for examining CAM therapies and medications include experimental study (laboratory and animal); randomised controlled trial (RCT) design; cohort study (longitudinal); cross-sectional study; case-control study and case studies (US National Library of Medicine, 2007). Concurrently, research methods pertaining to public health and health services form an integral part of enquiry into the use of CAM within clinical populations and populations in general (Adams et al., 2012). Each of these various methods of researching CAM holds a valid place in furthering the understanding of the diverse issues around CAM and its utilisation (Adams, 2007).

Until recently, medical and health research has predominantly focused on RCTs, this is because they offer the benefits of random sampling and manipulation as well as control, and thus increase the validity of efficacy and effectiveness studies (Walker, W., 2005). The importance of RCTs for potentially establishing an evidence base for CAM therapies and products is undisputable in the context of issues of safety and efficacy of these therapies and products (Adams et al., 2012). While efficacy and effectiveness studies through RCTs and other experimental designs in CAM research are essential, there are other study designs that are useful in understanding the scope and role of CAM in health care (Verhoef, Casebeer & Hilsden, 2002). Such study designs are equally important in translational research, enabling interpretation of clinical trials into practice, and in informing policy and health-care delivery – especially in the context of increasing prevalence of CAM use in populations (Adams, 2007; Adams et al., 2012).

1.2.2 The contribution of health services research to the examination of complementary and alternative medicine

Within the wider range of research methods, this thesis adopts an HSR approach to critically examine women's use of complementary and alternative medicine for back pain.

1.2.2.1 Definition of health services research

HSR is positioned within a broad domain of multi-disciplinary approaches encompassing basic, as well as applied, research for improving the understanding of the effects of health-care provision on individuals and populations (Lohr & Steinwachs, 2002). The field of HSR emerged as a study discipline during the 1960s to inform policies by monitoring access to health care and the cost and quality of health care in order to link biomedical research with health-care provision (Lohr & Steinwachs, 2002). In 2000, the Association for Health Services Research (AHSR) in the United States updated the definition of HSR to represent "the multi-disciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviours affect access to health care, the quality and cost of health care, and ultimately our health and well-being. Its research domains are individuals, families, organizations, institutions, communities, and populations" (Lohr & Steinwachs, 2002).

By including a broad range of disciplinary perspectives in the field of health care, HSR has evolved to extend the scope of research interest across a range of topics such as health care behaviours, decision-making, service delivery, communication, accessibility, cost and outcomes of health care delivery and provision (Adams & Steel, 2012).

HSR integrates epidemiologic, sociological, economic and other analytical scientific methods in the study of health services (Last, 1988). By drawing upon research designs, analytic techniques and methods from these scientific fields, HSR can estimate the prevalence of use of health services and evaluate the outcomes of the healthcare delivery that is accessed by individuals, groups or populations (US National Library of Medicine, 2007). Data in HSR is primarily drawn from population

surveys, documents and direct observations (Shi, 2007). HSR often uses survey questionnaires, medical records, health-status and quality of life measures and condition-specific measures administered to representative samples of population in order to obtain data about the patient experience of health care (Hughes, R. G., Steinwachs & Hughes, 2008). Using these databases in HSR offers opportunities to examine large representative samples at relatively low cost and to systematically analyse health care utilisation for common conditions (Hughes, R. G. et al., 2008). Beyond these, HSR methods include the examination of processes of care such as doctor-patient communication patterns and their impact on satisfaction with and outcomes of care (Hughes, R. G. et al., 2008). HSR plays an important role in informing governments, insurers, consumers and others making decisions about health-related issues (Hughes, R. G. et al., 2008). The evidence generated by HSR can contribute towards advising health-care providers and health care systems with regard to practices, policies and therapies in order to improve the effectiveness of care provision for populations and individuals (Horner, Russ-Sellers & Youkey, 2013).

1.2.2.2 Health services research approach used for the investigation of complementary and alternative medicine

Appropriate methodologies for researching CAM issues and the need for developing CAM research agendas have been the subject of continuous discussion since the early 1990s as the popularity of the therapies has increased (Levin et al., 1997). Although establishing evidence through efficacy studies for CAM therapies and products, the emphasis is on conducting the gold standard RCTs, the need to also understand aspects of CAM utilisation through HSR approaches, has also been highly recommended by various expert groups on CAM research (Herman, D'Huyvetter & Mohler, 2006; Levin et al., 1997; White House Commission on Complementary and Alternative Medicine Policy, 2002). Unlike the routine application of HSR approach in examining conventional health-care topics, since its inception as a discipline in 1960s, HSR for CAM is fairly recent and thus rarely applied when examining CAM topics (Adams, 2007).

With the increase in chronic illnesses across developed nations over the last few decades, the consumption of CAM by patients and communities has become a significant component of health care utilisation (Harris, P. & Rees, 2000; Harris, P. E.

et al., 2012). Unlike conventional medicine that requires demonstration of evidence on safety and efficacy prior to its usage, CAM therapies and products are often used with little evidence and have therefore drawn a great deal of research attention in response to their unsubstantiated benefits, yet widespread consumption (Berman & Straus, 2004). Despite attempts to understand CAM usage by the general public, there is much criticism on the nature of the robustness of research methodologies employed by studies on CAM use (Harris, P. E. et al., 2012). In this context, the HSR approach is particularly important as it provides opportunities to explore a range of important questions on CAM utilisation, which otherwise remain un-answered. Therefore, the HSR approach can provide unique knowledge on CAM utilisation – such as the prevalence of CAM use, the determinants of CAM use and the profile and characteristics of CAM users. HSR explores information sources and factors influencing decision-making on CAM use, the user experience of CAM, communication between CAM users and health care providers, and highlights the interface between CAM and conventional medicine (Adams, 2007). Further, HSR is a suitable approach for exploring reasons for CAM use and common conditions or diseases for which CAM is used (Adams & Steel, 2012).

In contrast to RCT designs, HSR is more suited to exploring multiple issues regarding CAM use, which may be separate or inter-related. HSR therefore is a valuable adjunct for safety and efficacy studies on CAM that using RCTs, and broadens the evidence base for clinical investigations as well as CAM practice (Adams, Sommers & Robinson, 2013). Also, the application of HSR for CAM research helps address the effectiveness gaps of conventional medicine (Fisher et al., 2004). Moreover, HSR approaches in CAM research can provide knowledge that is useful for government, health-care providers, consumers and health-policy makers (Adams, 2008).

The significance of the HSR approach in researching CAM is reflected in the strategic plans and funding of research in CAM using the HSR approach by government agencies such as the National Centre for Complementary and Alternative Medicine (NCCAM) in the US by the National Center for Complementary and Alternative Medicine, 2011. In Australia, the Australian Research Centre in Complementary and Integrative Medicine (ARCCIM) has attracted more than AUD\$11 million in funding from the National Health and Medical Research Council (NHMRC) and the Australian Research Council (ARC), via competitive grants funding public-health and HSR initiatives focusing upon CAM use (Australian Research Centre in Complementary and Integrative Medicine, 2015). Similarly, UK organisations, such as the Research

Council for Complementary Medicine (RCCM), uphold HSR in CAM as a strategic goal (Research Council for Complementary Medicine, 2009).

In conclusion, through HSR it is possible to examine issues related to CAM, broader health-care utilisation and health-services issues among individuals and among the wider populations. As such, a HSR approach is suitable for addressing the research aims and questions of this thesis (see Sections 1.3.1 & 1.3.2).

1.2.3 A health services research approach to examining complementary and alternative medicine in the context of back pain care

Back pain is among the most prevalent conditions affecting adults, not only in Australia (Masters, 2004) but internationally, impacting the quality of life of individuals and whole populations (Buchbinder, Jolley & Wyatt, 2001). Although non-steroidal anti-inflammatory drugs (NSAIDs) are effective in symptomatic pain relief for back pain (van Tulder, M. et al., 2000), due to the adverse side effects and overall poor success rates of conventional medical treatments (Pengel et al., 2003), back pain sufferers tend to seek CAM especially as unresolved back pain progresses to chronic back pain, thus causing physical and psychological distress and prompting back-pain sufferers to explore options outside conventional medicine (Sibbritt, D. W. & Adams, J., 2010). In particular, women tend to report back pain more frequently than men (Walker, B. F., Muller, R. & Grant, W. D., 2004); and, in general, women are known to use CAM more than men (Barnes, Patricia M, Bloom & Nahin, 2007; Xue, C. C. L. et al., 2007). While previous research has focused on one or two particular types of CAM provider in back-pain care (Kelner et al., 2006), few studies have examined patients' use of a wide-range of CAM. There has been very little research into the area of consultations with CAM practitioners and the use of self-prescribed CAM treatments for back pain.

Previous research has focused on the efficacy of popular CAM therapies for back pain examined through RCTs, which had produced promising but inconclusive results, or it had looked at individual CAM therapies and/or examined the use of CAM practitioner consultations/self-prescribed CAM treatments together via cross-sectional surveys utilising non-representative samples and/or small scale studies (Gagnier, J J et al., 2007; Licciardone, J., Brimhall, A. & King, L., 2005; Peleg et al., 2011; Sherman, K. J. et al., 2004; Walker, B. F. et al., 2010).

Complementary and alternative medicine utilisation for back pain includes a range of therapies provided by CAM practitioners such as chiropractors, osteopaths, acupuncturists, massage therapists, naturopaths or herbalists, and self-prescribed CAM treatments such as herbal medicines, vitamins or yoga (Sibbritt, D. W. & Adams, J., 2010).

The diverse nature of CAM, as seen in the multitude of treatment perspectives and approaches to back-pain care, may well be reflected in the service delivery offered by different CAM modalities representing both specific CAM practitioner groups and CAM products.

To date, little attention has been given to HSR approaches to understanding the factors, which cause back-pain sufferers to use CAM, or their choices of CAM practitioner groups/therapies and self-prescribing behaviours. Research employing a large population-based, nationally representative sample of back-pain sufferers is especially scarce. These topics deserve detailed examination and HSR may aid in not only investigating the roles of CAM practitioners in back-pain care provision, and self-management of back-pain care by back pain sufferers, but may also contribute to highlighting the role of CAM within the broader context of health-care provision.

This study employs a well-recognised research approach to close the gap in knowledge on CAM use for back pain. By examining how back-pain sufferers use CAM, the HSR approach contributes to linking healthcare practice with health policy for back-pain care. This thesis uses an HSR approach to examine the use of a broad range of CAM modalities among a large sample of women experiencing back pain, including through both CAM practitioners and self-prescribed CAM treatments. The specific research aims and scope of the thesis are outlined below.

1.3 Aims and scope of thesis

1.3.1 Research aim

The aim of this study is to investigate the use of complementary and alternative medicine for back pain by women aged 60-65 years across Australia through the application of a health services research approach.

1.3.2 Research questions

In order to address the above research aim, the study will answer the following research questions:

1. a) What is the incidence of back pain sufferers' use of CAM internationally?
1. b) What are the characteristics of CAM users and the factors influencing decision-making on CAM use, the self-perceived effectiveness of CAM and what does international literature show us about back pain sufferers' communication about CAM use with health care providers?
2. What is the frequency of consultations with groups of CAM practitioner (i.e. acupuncturists, chiropractors, herbalists and naturopaths, massage therapists, yoga/meditation practitioners, osteopaths) by Australian women back-pain sufferers aged 60-65 years?
3. How prevalent is the use of self-prescribed CAM treatments (i.e. herbal medicines, vitamins, minerals, supplements, yoga/meditation, aromatherapy oils) by Australian female back-pain sufferers aged 60-65 years?
4. a) What attitudes toward CAM influence the decision-making on consultations with CAM practitioner groups (i.e. massage therapists, chiropractors, acupuncturists) by Australian female back-pain sufferers aged 60-65 years?
4. b) What attitudes toward CAM influence decision-making on self-prescribing CAM products (i.e. herbal medicines, vitamins, minerals, supplements) by Australian

women back-pain sufferers aged 60-65 years?

5. a) Do Australian women with back pain aged 60-65 years communicate with their health care providers (i.e. GPs, pharmacists, CAM practitioners) regarding CAM use for back pain?
5. b) What information sources influence CAM use (i.e. doctor, friends, colleagues, relatives, partner, alternative health practitioner, pharmacist, book or magazine, mass media, allied health worker, internet) by Australian women aged 60-65 years with back pain?
5. c) What are the associations between a range of influential information sources and consultations with different CAM practitioner groups (i.e. chiropractors, acupuncturists, herbalists and naturopaths, massage therapists, osteopaths) for back-pain related symptoms by Australian women aged 60-65 years?

1.3.3 Significance and scope of thesis

Even though there is considerable international evidence on the broader use of CAM, and on CAM use for back pain in particular, there exists little knowledge on the use of CAM for back pain by middle-aged women. There is a lack of high quality research examining the use of CAM consultations and self-prescribed CAM treatments by women for back pain. As such, a well-designed, large-sample study is needed on CAM use among female back-pain sufferers. In particular, there is a need for detailed examination of CAM consultations and self-prescribed CAM use for back pain by Australian women in their mid-age.

The research presented in this thesis represents the first large, nationally-representative study of CAM use by Australian women aged 60-65 years with back pain. This large-scale, national study provides novel empirical insight into the use of CAM in back-pain care, information on how decisions regarding choice of CAM practitioner(s) or choices of self-prescribed CAM treatments are made by women, and what information and knowledge underpin women's decision making in choosing CAM for back-pain care. This research will provide valuable new information

regarding women's use of CAM in back-pain care by conducting a cross-sectional analysis.

The work presented in this thesis is part of a wider project examining health service utilisation of women with back pain. In addition to the quantitative survey data collection there were qualitative interviews conducted on a subset of 50 women (who participated in the survey). This work has been presented in the following publication:

Kirby, E. R., Broom, A. F., Adams, J., Sibbritt, D. W., & Refshauge, K. M. (2014). A qualitative study of influences on older women's practitioner choices for back pain care. *BMC Health Services Research*, 14(131). doi: 10.1186/1472-6963-14-131

1.3.4 Organisation of thesis

Chapter 1 presents background information on: an HSR approach to CAM research both generally and specifically relating to women's use of CAM for back pain; the wider context of CAM including CAM definitions, categories of CAM modalities, utilisation of CAM generally for women's health and specifically among women with back pain; and the wider context of back-pain care in Australia – including conventional and CAM provision and provider options.

Chapter 2 reviews the international literature relating to CAM use for back pain, with a focus on the prevalence of CAM use for back pain, commonly used CAMs for back pain care, CAM users' profile, reasons for CAM use, influential factors on decision-making regarding CAM use, self-perceived effectiveness of CAM use for back pain, patient communication about CAM use with health care provider, and referral by conventional medical professionals to CAM for back pain between 2000-14. A 15-year period was chosen as it is an optimal time frame for reviews, to consider contemporary research. The findings have been published in *The Spine Journal*.

Chapter 3 describes the methodology, study design, sample selection, ethical considerations and statistical analysis employed in the research.

Chapter 4 presents the results from the study regarding the prevalence of use and characteristics of Australian women (aged 60 -65 years) who use CAM practitioners for back pain. These findings have been published in the journal *Clinical Rheumatology*.

Chapter 5 presents the results from the study regarding the prevalence of use and characteristics of Australian women (aged 60-65 years) who self-prescribe CAM treatments for back pain. These findings have been published in the journal *Complementary Therapies in Medicine*.

Chapter 6 presents the results from the study regarding back pain sufferers' attitudes toward CAM, the associations between women's attitudes toward CAM and consultations with three types of CAM practitioner groups and the associations between women's attitudes toward CAM and three types of self-prescribed CAM products. These findings have been published in the journal *Complementary Therapies in Medicine*.

Chapter 7 presents the results from the study regarding factors influencing decision-making on CAM use for back pain, and back-pain sufferers' communication about CAM use with health care providers; the associations between influential information sources and consultations with five types of CAM practitioner groups for nine different symptoms related to back pain. These findings have been published in the journal *Health and Social Care in the Community*.

Chapter 8 discusses the implications of the findings of this thesis in the context of previous research, identifies limitations of the study, highlights important issues relevant to the research objectives and identifies areas for future research.

Chapter 9 summarises the primary findings of this thesis, and highlights future research and policy directions, which may be addressed from the results of the study.

Overall, this thesis provides a first step to examining CAM use by women with back pain applying an HSR methodology. Drawing upon evidence from the literature review, the analyses of data from the ALSWH provides novel empirical evidence and insight on the use of a wide range of CAM consultations and self-prescribed CAM treatments for back pain. The combination of findings from the literature review and the analyses presented in this thesis can contribute to fully explore and understand the details of CAM use in the management of back pain by middle-aged women.

1.4 The wider significance of complementary and alternative medicine

The fundamental topic of this thesis is the utilisation of CAM. In recent years, a distinct prevalence of CAM use has been noted among populations and particularly among women in developed countries. The use of CAM by women is well documented, and while it is known that women of all ages use CAM for diverse health conditions, CAM use for back pain has been known to be particularly prevalent among women in their middle-age years. This background section gives an outline of the definitions and modalities of CAM, the utilisation of CAM by the general population and particularly by women suffering from back pain in Australia. The chapter further looks at topics that are important within CAM provision in the context of the Australian healthcare system.

1.4.1 Definition of complementary and alternative medicine

CAM has become an important topic in health research in recent years and its increasing use in public health makes CAM a significant issue impacting on healthcare provision and health policy (Adams et al., 2012). CAM refers to a broad range of healing modalities external to the biomedical models of health care. Providing a singular definition of CAM is problematic, with more than 300 modalities categorised as CAM (Chez & Jonas, 1997). The Ministerial Advisory Committee for Complementary and Alternative Health [MACCAH], established in New Zealand in 2001, has adopted the following definition:

Complementary and alternative medicine is a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period. CAM includes all such practices and ideas self-defined by their users as preventing or treating illness or promoting health and well-being (O'Connor et al., 1997).

Due to vast differences in the philosophy, principles, health assessment techniques and the treatments employed by CAM modalities, many of the policy documents adopt the CAM classification proposed by Ben-Arye et al., Crawford et al., and Liu et al., (Ben-Arye, Scharf & Frenkel, 2007; Crawford et al., 2006) and Liu et al., (Liu et al., 2009) (see Table 1), which identifies seven groups of therapies commonly associated with CAM.

Table 1 General classification of CAM

Category	Description
Mind-body interventions	Yoga, mental imaging, meditation, relaxation and astrology
Alternative systems of medical practice	Ayurveda, Chinese medicine, acupuncture, homeopathy, naturopathy, aromatherapy, reflexology and iridology
Lifestyle and disease prevention	Herbology, special diet therapies
Biologically-based therapies	Orthomolecular medicine, pharmacological, biological and instrumental interventions
Manipulative and body-based systems	Chiropractic, massage and body work, unconventional physical therapies
Biofield medicine	Therapeutic touch, Reiki
Bioelectromagnetics	Transcranial magnetic stimulation [TMS]

Source: (Ben-Arye et al., 2007; Crawford et al., 2006; Liu et al., 2009)

The Australian Medical Association defines CAM as “refer[ing] to a wide range of non-prescription products with health claims such as herbal medicines, homeopathic medicines, nutritional and other supplements” (Australian Medical Association, 2002) as well as “acupuncture, chiropractic, osteopathy, naturopathy, and meditation” (Australian Medical Association, 2002). Such broad definitions and classification of CAM pose challenges in clearly defining the boundaries of CAM practice and products. As such, the definition of CAM employed in this study on which the thesis is based, is as follows: “A diverse group of healthcare practices and products not traditionally associated with the medical profession or medical curriculum” (Adams et al., 2012). For the purpose of this thesis, a range of CAM modalities fundamental to women’s health were chosen from the group of commonly used CAM modalities in Australia based on a report by the World Health Organization (WHO) and Australian Institute of Health and Welfare (AIHW), *Health Service Delivery Profile Australia 2012* (WHO & AIHW, 2012). CAM practitioner groups included in the study are: acupuncturists, chiropractors, herbalists and naturopaths, massage therapists, yoga and meditation practitioners and osteopaths. Self-prescribed CAM treatments or

products included in the study are: herbal medicines, vitamins and minerals, supplements, yoga or meditation and aromatherapy oils.

1.4.2 Contemporary context of complementary and alternative medicine

CAM is a widely-used treatment option and is becoming increasingly popular among the general population across developed nations. This section provides the prevalence of CAM use, profile of CAM users, and CAM utilisation by women – specifically the use of CAM for back pain.

1.4.2.1 Prevalence of complementary and alternative medicine use

Studies have reported the growing use of CAM by utilising national surveys and other cross-sectional surveys including studies from the US (Barnes, Patricia M et al., 2007), Australia (Xue, C. C. L. et al., 2007), Canada (McFarland et al., 2002), UK (Hunt et al., 2010) and South Korea (Ock et al., 2009). A systematic review examined the use of CAM over 12-months in the general populations and identified that rates of CAM use varied across countries. For instance, the rates of CAM use were 76% in Singapore (2002); 76% in Japan (2001); 74.8% in South Korea (2006); 68.9% in Australia (2005); 38.3% in the US (2007); 26.3% in the UK (2005); 20% in Sweden (2000) and 14.4% in Canada (1998) (Harris, P. E. et al., 2012). This systematic review also identified rates of CAM practitioner visits and revealed the rates as 12.1% in the UK (2005); 16.2% in the US (2007) and 44.1% in Australia (2005) (Harris, P. E. et al., 2012). In another systematic review on CAM utilisation by the general populations examining ten different countries – Australia, Austria, Canada, Denmark, Germany, Great Britain, Italy, South Korea, Switzerland, United States – the study identified the most commonly used CAM therapies as chiropractic, herbal medicine, massage and homeopathy (Frass et al., 2012). This study also noted that acupuncture and homeopathy had significantly higher prevalence in European countries (Frass et al., 2012). This study further reported rates of prevalence for various CAM modalities across several countries and noted wide differences in prevalence, with acupuncture ranging from 0.4% in the US to 11% in Denmark; naturopathy ranging from 0.2% in the US to 5.7% in Australia; homeopathy ranging

from 0.1% in South Korea to 33.3% in Australia; aromatherapy ranging from 0.6% in Australia to 3.5% in Great Britain; herbal medicine ranging from 0.4% in Australia to 26.6% in Germany; chiropractic ranging from 0.5% in South Korea to 16.7% in Australia; massage ranging from 1.4% in South Korea to 18.2% in Germany; osteopathy ranging from 0.2% in Australia to 4.3% in Great Britain and meditation ranging from 0.2% in Great Britain to 7.6% in the US (Frass et al., 2012). A systematic review of 87 studies from European Union countries on prevalence of CAM use reported a vast difference in prevalence across Europe, based on the definition of prevalence of CAM use as 'any CAM at any time' (Eardley et al., 2012), ranging from 0.3% in the UK to 86% in Turkey. This study identified the five most commonly used CAMs in Europe and reported the prevalence rates as follows; herbal medicine (5.9% - 48.3%); homeopathy (2% - 27%); chiropractic (0.4% - 28.8%); acupuncture (0.44% - 23%) and reflexology (0.4% - 21%) (Eardley et al., 2012). An Australian study employing a nationally representative sample of 1,067 adults, 18 years and above, reported 68.9% prevalence of CAM use from a set of 17 CAM therapies during the year 2005. Some 64% of the participants in the study had visited a CAM practitioner over the previous 12 months (Xue, C. C. L. et al., 2007). The prevalence of use for specific CAM therapies reported in this study was; 27.2% for massage therapy; 17.5% for meditation; 16.3% for herbal medicine; 16.1% for aromatherapy; 16.1% for chiropractic; 12% for yoga; 10.7% for naturopathy; 9.2% for acupuncture and 4.6% for osteopathy (Xue, C. C. L. et al., 2007).

Although a number of studies from various nations report on prevalence of CAM use, it is important to note that a very small proportion of studies on CAM use are rigorous and commentators have identified a number of methodological weaknesses and inconsistencies (Eardley et al., 2012; Posadzki et al., 2013). Among these, the most commonly noted weaknesses were; definition of CAM use in the study not described to the participants; a wide variation in definitions of CAM when defined within the studies; small study samples; studies of non-representative samples; inconsistent reporting; non-reporting of confounders in statistical analysis and a wide variety of time periods (e.g. use of CAM in the previous 24 hours; any time; over the past 24 months) resulting in recall bias.

1.4.2.2 The characteristics and determinants of complementary and alternative medicine users

As noted above, there is high usage of CAM among the general public in various nations, although comparison between prevalence of CAM use in different countries is difficult. However, current literature seems to suggest a considerable uniformity in the profile of CAM users with regard to gender, educational level and income. Studies reviewing prevalence of CAM from across the globe – including the US, Australia, UK, Canada, Germany – reported consistent evidence that women are higher users of CAM than men, and CAM users tend to be well educated in comparison to non-users of CAM (Bishop, Felicity L & Lewith, 2010; Frass et al., 2012). A systematic review of CAM use in Europe also found that women are higher users of CAM than men (Eardley et al., 2012). National surveys from England (Hunt et al., 2010), Canada (Metcalf et al., 2010) and the US (Okoro et al., 2012) all reported that female gender is a predictor for CAM use. CAM use was associated with higher education in studies from various countries including; Australia (MacLennan, Wilson & Taylor, 2002); Canada (McFarland et al., 2002); Israel (Shmueli, Amir & Shuval, 2006); Scandinavia (Hanssen et al., 2005); US (Honda & Jacobson, 2005) and the UK (Hunt et al., 2010).

National surveys from the US, Canada, UK and other EU countries found that use of CAM was associated with higher levels of income (Bishop, Felicity L & Lewith, 2010; Hunt et al., 2010; Metcalf et al., 2010). The use of CAM seems to be more common among middle-aged people than older or younger individuals, as reported by studies from across North America, Australia, Europe and the UK (Bishop, Felicity L & Lewith, 2010). A national population-based survey in England reported that CAM use was most common among people aged 46.8 ± 15.5 years (Hunt et al., 2010). In the US, a population-based national survey of people with functional limitations identified CAM users to be between 18 to 54 years of age (Okoro et al., 2012), and a population-based survey in US and Canada, of adults with chronic diseases, noted that the most common age group of CAM users was 25 to 44 (Metcalf et al., 2010). Although CAM users tend to be of white ethnicity, commentators suggest that evidence on ethnicity and CAM use is difficult to ascertain as ethnicity as a predictor for CAM use may be related to specific CAM modality rather than CAM in general (Bishop, Felicity L & Lewith, 2010). Studies report that CAM users generally live in urban areas (Eisenberg, D M et al., 1998; Thomas, Nicholl & Coleman, 2001) but there is also evidence that women from rural areas tend to be frequent users of CAM (Adams, Sibbritt & Lui, 2011). CAM use is associated with being in poor health and long-

standing illnesses (Hunt et al., 2010). Studies report certain health conditions such as anxiety, depression, asthma, migraines, headaches, insomnia, musculoskeletal problems, back pain and arthritis as determinants of CAM use (Bishop, Felicity L & Lewith, 2010; Eardley et al., 2012; Frass et al., 2012; Hunt et al., 2010; Metcalfe et al., 2010).

In Australia, a national survey on CAM use in 2005 revealed that CAM users tend to be female, 75.3% were between the ages of 18-34, 69% were 35-64 and 57.8% were aged 65 and over (Xue, C. C. L. et al., 2007). This study also found that CAM users had higher levels of education and higher than average income and tend to have private health insurance (Xue, C. C. L. et al., 2007). CAM users are known to use CAM alongside conventional medical treatments (Adams, 2007). In Australia, 71.2% of CAM users had visited a medical practitioner in the preceding 12 months during 2005 and 38.1% had visited both a medical practitioner and a CAM practitioner with 6% visiting a CAM practitioner only during this period (Xue, C. C. L. et al., 2007).

In addition, research has found that there is a substantial out-of-pocket expenditure on CAM usage (Bodeker & Kronenberg, 2002). It is estimated that a total of \$US33.9 billion was spent on consultations with CAM practitioners and on CAM products and therapies in the US in 2007 (National Center for Complementary and Alternative Medicine, 2009). In Australia, approximately A\$ 416 and A\$ 349 per annum per person was spent on visits to CAM practitioners and on self-prescribed CAM in 2009, respectively (Adams, Sibbritt, et al., 2011). A national survey on CAM use in 2005 estimated the annual expenditure by Australians on CAM products at A\$ 1.86 billion, on CAM practitioner consultations at A\$ 1.73 billion, and on purchase of other CAM items at A\$ 0.54 billion with an estimated total expenditure by the adult Australian population of A\$ 4.13 billion on CAM use annually (Xue, C. C. L. et al., 2007). Further, private health insurance is associated with increased use of CAM (Spinks & Hollingsworth, 2012) and certain CAM therapies are subsidised through many private health insurance companies in Australia (Medibank, 2015).

1.4.2.3 Complementary and alternative medicine practice in (mid-age) women's health

It is known that across all age groups women use CAM more than men and CAM use by middle-aged women is particularly high in developed nations (Upchurch et al., 2010). A US national health survey in 2002 estimated the rate of CAM use at 45% for women aged 45-57 years (Brett & Keenan, 2007). In Australia, a base line longitudinal study on women's health during the year 1996 estimated that 28% of mid-aged women (45 -50 years) consulted an alternative medicine practitioner in during 1996 in comparison to 19% of younger women (18-23 years) and 15% of older women (70-75 years) (Adams, J. et al., 2003). In the year 2010, 74.7% of Australian women aged 58-63 had self-prescribed CAM treatments in the previous 12 months (Bowe et al., 2015).

Women seem to use CAM for a range of health issues including back pain, arthritis, headaches, insomnia, depression, cancer, pregnancy-related conditions, menstrual symptoms and menopausal symptoms (Wade et al., 2008). In a nationally representative American study, women commonly used chiropractic, yoga or meditation for back pain; vitamins and nutritional supplements for joint pain or arthritis; chiropractic, yoga and meditation for headaches; herbs, teas, vitamins and nutritional supplements for insomnia and depression (Wade et al., 2008). In 2010, Australian women aged 58-63 had self-prescribed vitamins or minerals (69%) for joint pain, allergies/hay fever, high-cholesterol and low-iron levels; herbal medicines (27%) for back problems, allergies or hay fever, hot-flushes, arthritis; aromatherapy (15%) for headaches or migraines (Bowe et al., 2015).

Women who use CAM seem to have higher levels of education, higher levels of income and report poorer health status (Adams, J, Sibbritt, D W, et al., 2003; Wade et al., 2008). Some of the drivers for the use of CAM by women include orientation towards self-care, commitment to proactive and preventative approaches to individual health care, belief in holistic model of health, and having an interest in personal responsibility for health (Parkman, 2005). It has been reported that women gather information from both professional and non-professional sources such as GPs, friends and family in their decision-making on CAM use (Broom et al., 2012b; Wade et al., 2008). It is also known that mid-age women using CAM actively seek information on CAM treatment options, CAM practitioners and effectiveness of CAM treatments (Broom et al., 2012b).

1.4.2.4 Complementary and alternative medicine practice in back pain care

While much is known about the broader use of CAM (Eisenberg, D M et al., 1998; Robinson & McGrail, 2004; Stange, Amhof & Moebus, 2008; Wade et al., 2008), few studies have investigated CAM use specific to back-pain care (Côté, Cassidy & Carroll, 2001; Hughes, C., Quinn & Baxter, 2011; Ong, C. K. et al., 2004) and fewer studies have differentiated CAM practitioner consultations (Côté et al., 2001; Ong, C. K. et al., 2004) from self-prescribed CAM treatments among back-pain sufferers. In 2007, the ALSWH found that of all the women (n= 9,820) surveyed, 54.8% of women had back pain, were aged 53-61 years, and that 63% of these women had either consulted a CAM practitioner or had self-prescribed CAM (Broom et al., 2012a; Sibbritt, D.W., & Adams, J., 2010). It is known that backpain sufferers tend to use CAM in addition to seeking help from a range of treatment providers (Breivik et al., 2006; Chenot et al., 2007; Côté et al., 2001; Haetzman et al., 2003; Mortimer & Ahlberg, 2003) with the occasional exception of exclusive CAM use (Haetzman et al., 2003; Stange et al., 2008). As definitions of CAM tend to differ in studies, a wide variation in the prevalence of CAM use is noted in previous studies. A UK study reported 15.7% of patients suffering from chronic pain (n=840) had taken alternative medications (Haetzman et al., 2003). A US survey on women (n=808) showed that of the 41.3% of respondents who reported back pain, 33.8% had used CAM treatments (Wade et al., 2008).

Of the various CAM treatments for back pain, the most commonly used modalities were found to be: chiropractic (Côté et al., 2001; Eisenberg, D M et al., 1998; Mortimer & Ahlberg, 2003; Xue, C., C L et al., 2008); massage (Breivik et al., 2006; Chenot et al., 2007; Côté et al., 2001; Eisenberg, D M et al., 1998); acupuncture (Breivik et al., 2006; Eisenberg, D M et al., 1998; Xue, C., C L et al., 2008) and osteopathy (Mortimer & Ahlberg, 2003). A US national survey of adults using acupuncture (n=31,044) showed 34% of participants had acupuncture treatments for back pain (Burke et al., 2006). Surveys from European countries with comparable population samples report chiropractic as one of the most common treatments for back pain with rates around 12-14% (Côté et al., 2001; Ong, CK et al., 2004), whereas a German study identified massage as the most commonly used treatments for back pain (Chenot et al., 2007). With few studies investigating CAM use for back pain (Côté et al., 2001; Hughes, C et al., 2011), very little is known about CAM consultations and exclusive self-prescribed CAM use for back pain. Also, interpreting the findings from previous research on the prevalence of CAM use in back pain is

challenging due to the wide variation in study designs (including definition of CAM) and the purpose, duration, population, setting and sample size across different studies.

The use of CAM for back pain is more common among the mid-aged (Ong, CK et al., 2004; Wade et al., 2008; Xue, C, CL et al., 2008) and women using CAM for back pain tend to be more educated and have higher income than those who do not use CAM (Broom et al., 2012a; Eisenberg, DM et al., 1998; Ong, CK et al., 2004; Sibbritt, DW, & Adams, J, 2010; Thomas et al., 2001). With studies reporting that CAM users generally reside in urban areas (Eisenberg, DM et al., 1998; Thomas et al., 2001) there is also evidence that women from rural areas tend to be higher users of CAM (Adams, J, Sibbritt, DW, et al., 2003). However, it is not known if women who consult CAM practitioners for back pain predominantly reside in urban or rural areas.

Studies on the efficacy of treatments for back pain (conventional, allied and CAM) remain inconclusive (Deshpande et al., 2007; Furlan et al., 2008; Furlan et al., 2005; Gagnier, J et al., 2006; Licciardone, J, Brimhall, A, & King, L, 2005; Rubinstein, SM et al., 2011; van Tulder, M et al., 2000; Walker, BF et al., 2010; Weiner, DK & Ernst, 2004; Williams, K et al., 2009). A recent systematic review including 65 trials suggests that non-steroidal, anti-inflammatory drugs have more adverse side effects than paracetamol, despite being effective for symptomatic pain relief in the short-term (van Tulder, M et al., 2000). Opioids used in treating chronic back pain show neither significant pain relief nor improved functional ability and appear to be associated with side effects such as headache and nausea (Deshpande et al., 2007). Systematic reviews identify short to medium term improvement in pain from receiving osteopathy (Licciardone, J et al., 2005) and short term improvement in disability for those receiving chiropractic (Walker, BF et al., 2010), but do not show long-term improvement in pain relief, nor significant improvement in disability for these two modalities (Licciardone, J et al., 2005; Walker, BF et al., 2010). Massage therapy may be an effective approach for the management of non-specific low back pain (Furlan et al., 2008) especially when combined with exercise and self-education. Some herbal treatments (Gagnier, J et al., 2006; Weiner, DK & Ernst, 2004) appear to have low-level evidence of benefit, and while yoga has been shown to reduce pain and decrease medication use for back pain, there are no large studies to generalise these benefits (Williams, K et al., 2009).

Acupuncture, chiropractic and osteopathic treatments show some evidence of benefit in back pain, but there is little evidence of them being more effective than conventional treatments for back pain (Furlan et al., 2005; Rubinstein, SM. et al., 2011). As such, there is a lack of clear evidence base to guide patients' decision-making and health-seeking behaviour around back pain.

Further, back pain and associated problems are often diffuse and difficult to define in terms of; a) the source of problem and b) the degree to which the problem is in fact treatable (Chou, R. & Huffman, L H, 2007). Such diagnostic and prognostic uncertainties create an environment that is conducive to a diverse market of competing providers and over-the counter products offering varying choices in treating back pain. The availability of a wide range of treatments for back pain, particularly CAM, poses potential difficulties with regard to decision making involving different CAM practitioners and treatments.

In the past, research has focused mainly on one or two particular types of CAM providers (Kelner et al., 2006) in back-pain care, and few studies have examined patients' use of a wide range of CAM. There has been little research in Australia that examines consultations with CAM practitioners and use of self-prescribed CAM treatments for back pain. To address this research gap in the use of CAM for back pain in Australia, more detailed studies are required drawing upon specific CAM practitioners and self-prescribed CAM treatments commonly used by back-pain sufferers employing a large nationally representative sample. An examination of CAM use among back-pain sufferers will provide crucial insights into the relationship between CAM use and back-pain care, and further inform future CAM practice, research and health-care policy development. A sub-study from the ALSWH, on which this thesis is based, includes questionnaire items on a wide range of CAM provider and self-prescribed CAM treatments and products, and thus allows for examination of CAM use by mid-aged women with back pain.

1.4.3 Complementary and alternative medicine provision in the Australian healthcare setting

Until very recently, the biomedical profession has been the dominant authority in Australian health-care provision, shaping structures of health and care delivery (Baer,

2008). To date, the biomedical profession's primary position in health-care delivery is expressed through legislative supports such as statutory regulation, medical practice laws and third-party payment. In recent years, with the availability of diversified health-care options, this position of relative biomedical dominance has given way to therapeutic pluralism with an array of practices and practitioners operating within/ and beside (i.e. allied health) and outside (i.e. complementary and alternative medicine) the biomedical setting (Baer, 2008). The Health Practitioner Regulation National Law came into effect on 1st July 2010 (Australian Health Practitioner Regulation Agency, 2015), meaning that some CAM professions have undergone statutory regulation (e.g. Chinese medicine, chiropractic, osteopathy) and some CAM treatments are being subsidised by government support or via private health insurance rebates.

1.4.3.1 CAM practitioner registration

The Australian Health Practitioner Regulation Agency (AHPRA) is a national regulatory body, which regulates 14 health professions including some CAM professions in all states and territories of Australia under the National Regulation and Accreditation Scheme (Australian Health Practitioner Regulation Agency, 2015). All health-care professionals registered to practice in Australia are included on the national register of practitioners managed by AHPRA. Of the 14 national boards regulating various health professions, three boards are responsible for regulating Chinese medicine, chiropractic and osteopathy. The primary roles of these boards are to protect the public and to set standards and policies that every registered health practitioner must meet. Every registered health practitioner must attain the board's registration standards, including continuing professional development, criminal history registration, English language skills, professional indemnity insurance and recency of practice registration standards.

According to AHPRA's publication in September 2015, there were 4,716 registered chiropractors (under the Chiropractic Board), 1,925 registered osteopaths (under the Osteopathy Board) and, 4,410 registered Chinese medicine practitioners (under the Chinese Medicine Board). Within the registry for Chinese Medicine practitioners, 1,718 had registered as acupuncturists and 2,081 had registered as acupuncturists and Chinese herbal medicine practitioners. According to the Australian bureau of statistics census of population of housing data, the total CAM work force in 2006 was

19,401 practitioners including; chiropractors (n=2,488), osteopaths (n=777), traditional Chinese medicine practitioners (n=483), acupuncturists (n=946), massage therapists (n=8,191), naturopaths (n=2,982), homeopaths (n=238) and 'other CAM practitioners' (n= 3,296) (Leach, 2013). Most CAM services in Australia are delivered through primary health-care settings, with practitioners working in clinics or in group practices, with very few CAM services being provided through secondary or tertiary care settings such as hospitals and residential health care facilities (Adams, J et al., 2003; Leach, 2013). Most of the CAM practitioners are still not part of AHPRA, and are therefore not regulated by the national statutory regulatory boards, and are usually voluntarily self-regulated (Wardle, JJ et al., 2014).

1.4.3.2 Privatisation of CAM healthcare

Health services in Australia are paid for by a combination of sources including a universal public health insurance scheme called Medicare, – a government funded initiative – private health insurances, accident compensation schemes and out-of-pocket payment by patients (Australian Institute of Health and Welfare, 2014a). Medicare provides access to medical and hospital services and covers fees or subsidised treatments offered by health professionals mainly, doctors, specialists and allied health care practitioners (Australian Department of Human Services, 2016). While Medicare does not generally cover CAM services, acupuncture, when provided by a medical practitioner, is eligible for Medicare funding under specified conditions described by the Medicare Benefit Schedule. However, some chiropractic -and osteopathy services are funded by Medicare under 'individual, allied health services for chronic disease management' for patients with a chronic condition, and where complex care is needed (Australian Government Department of Health, 2016). Besides relying on public-health insurance by Medicare, Australians may choose optional additional coverage for some, or all, of the costs of health services, not covered under the Medicare scheme, through private health insurance (Australian Department of Human Services, 2016). Individuals opting to buy private health insurance can mix and match the types and levels of health insurance cover to suit their needs. There are two types of private health insurance – the hospital insurance policy, which pays for hospital treatments, and general treatment policy covers (also known as Ancillary Health Insurance) that pays for some health services such as physiotherapy, dental treatments, optical treatments and CAM therapies (Australian

Government Private Health Insurance Ombudsman, 2016). In 2011-12, 57.1% of Australian adults aged 18 years and above had private health insurance. Of these people with private health insurance, 79.1% had both hospital and ancillary cover, while 7.2% had ancillary cover only and 12.3% had hospital cover only. People aged 55-64 years had the highest percentage (67.5%) of private health insurance compared to people of other age groups (Australian Bureau of Statistics, 2013).

With regard to back-pain care in the Australian context, a wide range of primary care options are available and a combination of Medicare and private health insurance covers for some of the services offered by back pain care providers (Walker, BF Muller & Grant, 2003). Individuals with back pain typically consult a GP whose diagnostic recommendations and treatment charges are covered by either Medicare or by a combination of Medicare and private health insurance (Australian Department of Human Services, 2016; Walker, BF et al., 2003). While Medicare refunds all GP charges, only 85% of specialist fees are eligible for refund and any consultations with specialists typically require referrals by a GP (Australian Institute of Health and Welfare, 2014a). With regard to CAM treatments, Medicare covers acupuncture offered by a GP and chiropractic and osteopathic treatments in some circumstances (Australian Government Department of Health, 2016). Private health insurers are adding an increasing range of CAM therapies to their insurance coverage by including CAM professions such as chiropractic therapy, osteopathy, and acupuncture, massage therapy and naturopathy (Australian Government Department of Health, 2015). Research has shown that people who have private health insurance are more likely to use CAM compared to those who are not insured (Xue, CL et al., 2008). Generally, CAM services in Australia are paid for by users with limited options for coverage via private health insurance. The Australian Government may offer rebates to help cover the cost of insurance premiums based on certain criteria including compliance of health insurance policy with a registered insurer (Australian Government Department of Health, 2015). As the Private Health Insurance Act 2007 and Rules do not specify the coverage requirements for ancillary treatment where Medicare benefit is not available, insurers are responsible for taking decisions on criteria for covering CAM services (Australian Government Department of Health, 2015). While the Private Health Insurance (Accreditations) Rules 2013 enables private health insurers to pay benefits for CAM therapies, compliance with minimum standards as defined by health funds are required to be met. Only some private health insurers offer cover for CAM services and, where offered, they often have limits on what benefits qualify and include annual limits on the amount that may be

claimed (Australian Government Department of Health, 2015). Despite, public health insurance, and due to limited private health insurance coverage for CAM treatments, back-pain sufferers need to pay out-of-pocket expenses for most CAM treatments.

1.4.3.3 Regulation of CAM products

The Therapeutic Goods Administration (TGA) is an Australian governmental agency, which monitors the quality, safety and performance of therapeutic goods, including CAM products, available on the market (Department of Health, 2015). By applying the Therapeutic Goods Act 1989 standards, TGA classifies therapeutic goods as higher risk products or low risk products when made available to consumers. CAM products need to comply with regulations pertaining to the 'low risk' category and demonstrate that they are of acceptable quality and do not present significant safety risks (Department of Health, 2015). CAM products include vitamins, minerals, herbs, aromatherapy oils and homeopathic products. Most CAM products in Australia are listed or registered with TGA and are available at supermarkets, health food stores or pharmacies. While TGA monitors and assesses the quality of the ingredients in CAM products, it does not evaluate the efficacy and safety of the listed CAM products (Wardle, JJ et al., 2014).

1.5 The wider significance of back pain care

Back pain is one of the most common health problems affecting 80-85% of people over their lifetime and the most frequent complaint restricting activity among the young and middle-aged people (Hoy et al., 2010). A systematic review of global prevalence of low back pain revealed that the mean overall prevalence rate was 31%, and that low back pain is the most prevalent among women aged 40-80 years (Hoy et al., 2012). Being the second most leading cause of sick leave, back pain poses a great burden on individuals, families, communities, governments and health care resources (Hoy et al., 2010; Myburgh et al., 2015). Of the 291 disease conditions studied in 2010, low back pain was ranked as the greatest contributor to global disability (measured in years of life lost) and the sixth in terms of overall burden (measured in disability adjusted life years) (Hoy et al., 2014). Low back pain was ranked the greatest contributor to overall

disability in Australia (Hoy et al., 2014). Low back pain tends to be non-specific in most cases with only 10% of cases with identifiable specific causes and when back pain is persistent for several months, the resulting disability worsens with increasing duration of pain (Krismer & van Tulder, 2007).

Chronic back pain often results in loss of function, associated distress, behavioural problems, limited daily functioning ability besides work disability and dependence on others for care (Krismer & van Tulder, 2007). It is known that after six months of back pain related sick leave, fewer than 50% return to work, and after 2 years' absence from work it is likely to become permanent (Waddell G, 1998). Back pain sufferers cost hundreds of millions of dollars every year and are considered a major economic burden for the health system (see Section 1.5.1.7). Therefore, back-pain care services are an essential aspect of healthcare delivery. This following section addresses back pain care, with description of the definitions of back pain, impact of back pain on individuals and the economic burden caused by back pain.

1.5.1.1 Defining back pain

Back pain refers to pain of variable duration localised between the 12th rib and the inferior gluteal folds – with or without leg pain (Krismer & van Tulder, 2007). Defining back pain is complex, as back pain is neither a disease nor a diagnostic entity and is syndromic in presentation, seldom with a single identifiable cause and often non-specific (George E Ehrlich, 2003). Pain in the area between the neck and the lowest rib is not called 'back pain' and when pain is present in the neck region and/or an anatomical area between the neck and the lowest rib, the cause is generally organic; infectious, traumatic, neoplastic or referred pain (Ehrlich, 2003). As such, neck pain is a category in itself and 'back pain' almost always refers to 'low back pain'. Back pain presents usually as acute or sub-acute pain, lasting no more than six weeks to three months, or as chronic low back pain when it persists beyond three months (Krismer & van Tulder, 2007). While acute and sub-acute pain represent the early manifestation of the condition, chronic low back pain is associated with high levels of disability, characterising the late stages of the condition (Krismer & van Tulder, 2007). For the purpose of this thesis, the term 'back pain' and 'low back pain' (LBP) are used interchangeably.

1.5.1.2 Non-specific low back pain (Non-specific LBP)

When no specific pathology can be traced as causing back pain, the term 'non-specific low back pain' (LBP) is employed and non-specific LBP is the most common form of back pain (Ehrlich, 2003). One-year prevalence of non-specific LBP is estimated to be 15% to 45% and the lifetime prevalence is estimated at 60% to 70% in developed nations (Béatrice, 2013). Non-specific LBP may be experienced as aching, stabbing, burning, sharp or dull, well defined or vague, with varying intensity. The pain may begin suddenly or gradually (Béatrice, 2013). LBP is categorised into three types. When LBP occurs suddenly after a minimum period of six months without history of LBP and lasts for less than six weeks, it is considered as 'acute LBP' (Ehrlich, 2003). When LBP occurs suddenly after a period of a minimum of six months without LBP and lasts for between six weeks and three months, it is considered as 'sub-acute' (Ehrlich, 2003). LBP lasting for more than three months, and/or when LBP occurs episodically within a six-month period, it is considered as 'chronic LBP' (Krismer & van Tulder, 2007). For the purpose of this thesis, responses by women of having experienced back pain in the 12 months prior to the survey were considered for analysis.

1.5.1.3 Specific low back pain (Specific LBP)

Specific LBP is a term restricted to LBP with identifiable causes and accounts for less than 20% of LBP cases, the probability that a case of back pain has a specific cause is only 0.2% of all LBP cases (George E Ehrlich, 2003). These cases include back pain resulting from trauma (i.e. moving vehicle accident, fall), osteoporosis with fractures, prolonged use of corticosteroids among older people, vertebral infections; tumours, metabolic bone disease, psychogenic pain and congenital disorders (Ehrlich, 2003; George E Ehrlich, 2003). In this thesis, as the data is gathered through self-reporting by back-pain sufferers, the type of back pain is not specified.

1.5.1.4 Risk factors for LBP

When LBP results from specific causes, certain signs and symptoms are shown to be common. For example, violent trauma causing back pain may present with constant, progressive, non-mechanical pain associated with severe restriction of lumbar flexion

(Krismer & van Tulder, 2007). Often, when LBP is due to specific causes occurring in individuals over 55 years of age, the causes may be related to cancer, use of systemic steroids, drug abuse or human immunodeficiency virus (HIV) infection. In such cases, neurological symptoms, weight loss or thoracic pain may be present depending on the related cause and, additionally, neurological signs and structural deformities can often be elicited (Krismer & van Tulder, 2007).

While a minority of LBP cases have identifiable causes, most LBP (non-specific) is of obscure origin and may result from several factors such as lifestyle factors, heavy physical work, occupational risk factors, awkward static or dynamic postures, manual work, lifting and psychological factors (Béatrice, 2013). A range of psychological and occupational factors have shown to be linked with both the occurrence and chronicity of back pain (Krismer & van Tulder, 2007). Although the erect posture of humans can be a predisposing factor for back pain, the natural curvature of the spine counteracts such risk, except in conditions where distortion of the spinal curves is triggered by factors such as obesity or pregnancy (Ehrlich, 2003). Low abdominal strength or lumbar lordosis has also been shown to play a role in LBP (Ehrlich, 2003). Running, jogging, driving vehicles, sitting in inadequately responsive chairs and heavy lifting are also known to be risk factors for back pain (Ehrlich, 2003). Research has shown some evidence that both current smokers and former smokers have a higher risk for back pain in comparison to those who have never smoked (Shiri et al., 2010).

Psychological factors such as stress and anxiety have also been shown to be linked to the onset of back pain, while distress and depressive mood have been associated with the chronicity of back pain (Krismer & van Tulder, 2007). Poor job satisfaction seems to play a major role in the onset and chronicity of back pain and research has shown that although job dissatisfaction is strongly linked to back pain among younger men, this predisposition equalises itself among both genders as they get older (Ehrlich, 2003).

1.5.1.5 Biomechanics of LBP

The biomechanics of LBP can be complex and non-specific LBP may involve several tissues including muscles, ligaments, joint capsule cartilage, soft connective tissue and blood vessels (Béatrice, 2013). The tissues involved in back pain may be

strained, stretched, pulled or sprained producing inflammation and releasing inflammatory chemicals (i.e. cytokines, chemokines). These inflammatory chemicals stimulate the nerve fibres causing pain and swelling (Béatrice, 2013). Although disc herniation and spinal stenosis are often considered as risk factors for back pain, and despite surgical intervention in these conditions, the outcomes tend to be highly varied and such surgeries have rarely been shown to alleviate back pain definitively (Béatrice, 2013; Ehrlich, 2003). Overall, the mechanism of back pain can be obscure and the diagnosis of back pain may be complex making treatment of back pain uncertain.

1.5.1.6 Back pain related symptoms/co-morbidities

There is much evidence that pain conditions such as back pain are often associated with co-morbidities (Crombie & Davies, 1999; Dworkin, Vonkorff & LeResche, 1990). A number of conditions and symptoms – including headache, depression, anxiety, sleeping problems, fatigue and weakness – have been linked to LBP (Bingefors & Isacson, 2004). Due to the influence of psychological factors involved in the onset and progression of back pain, studies recognise psychological problems as being intimately associated with pain (Bingefors & Isacson, 2004). A population-based survey of 4,056 people aged between 20-64 showed that headache, as co-morbidity, was strongly linked to back pain (Bingefors & Isacson, 2004). In this study, headache, sleeping problems, anxiety and depressive symptoms were among the co-morbidities in both genders linked to back pain and pain in the extremities. Headache, depressive symptoms, sleeping problems and anxiety were among the highly-ranked co-morbidities for back pain and pain in the extremities among women (Bingefors & Isacson, 2004). Research suggests that psychological factors may cause pain conditions or are expressed as pain (Von Korff et al., 1988). It is also suggested that pain may cause mental health problems and that conditions such as depression may share common pathogenic mechanism with pain manifestation (Breslau et al., 1994).

Musculoskeletal pain may often manifest as widespread pain along with LBP. While, widespread pain preceding LBP is a strong predictor of chronic LBP, repeated incidences of acute LBP are known to evolve gradually into widespread pain conditions (Natvig, Bruusgaard & Eriksen, 2001). Such manifestations of pain associated with LBP may include neck pain, leg pain, sciatica, arm pain, muscle

spasms or stiffness. LBP may present as a symptom of fibromyalgia syndrome, which is a long-standing condition in which patients often self-report multitude of symptoms such as weakness, fatigue and stiffness (Weiner, R. S., 2001). Further, fibromyalgic patients may also report symptoms of Irritable Bowel Syndrome (IBS), which is characterised by nausea, weakness, fatigue and back pain as well as other digestive symptoms (George E Ehrlich, 2003). Even without the presence of fibromyalgia, those suffering from IBS may experience the above symptoms (Thompson et al., 2000). In addition, sciatica, a painful condition caused by compression of a nerve root in the lower back, manifests as back pain associated with radiating pain to the lower extremities and the sensation of pins and needles (Konstantinou & Dunn, 2008). Back pain is associated with many other conditions and those suffering from back pain may not only consult CAM practitioners or self-prescribe CAM treatments for their back pain, but also use CAM for a range of symptoms associated with back pain. Therefore, it is important to understand back pain sufferers' use of CAM for back pain in co-relation to a range of back-pain related symptoms. This thesis, analyses the prevalence of CAM practitioner consultations for back-pain related symptoms, factors associated with back pain sufferer's choice of CAM practitioners for back-pain related symptoms including influential information sources that direct back pain sufferers' decision making in their choice of CAM practitioner consultation for back-pain related symptoms.

1.5.1.7 Economic influences on back pain care

Back-pain care has been shown to pose a significant economic burden on individuals and healthcare systems in order to cover diagnostic costs, health care interventions and disability compensation. Chronic back-pain care in particular accounts for the highest consumption of economic resources (Maetzel & Li, 2002). In the absence of definitive clinical guidelines for back-pain care, the costs toward computerised tomography (CT) or other diagnostic imaging, as well as treatments, may often increase the overall economic burden of back-pain care (Maetzel & Li, 2002). Back-pain care involves both direct and indirect costs. While direct costs are for diagnosis, hospital care, rehabilitation, ancillary treatments including conventional medical, allied health and CAM treatments, the indirect costs comprise loss of earnings and loss of productivity (Walker, BF et al., 2003). As discussed in Section 1.4.2.4, despite public health and private health cover for costs associated with back-pain care, back-pain sufferers not only rely on their GPs for care but concurrently explore a range of other back-pain care options, which incur out-of-pocket expenditure. The various

components of back pain-care seeking comprise, firstly, visits to a GP, purchase of medications, follow up consultations. Secondly, diagnostic tests. Thirdly, visits to physiotherapists and/or allied health care professionals. Fourthly, besides specialist consultations, many back-pain sufferers consult CAM practitioners, use CAM therapies and purchase over-the-counter CAM products.

1.6 Overview of back-pain care provision and providers in Australia

Back-pain sufferers can draw upon a wide range of possible treatment providers in Australia who can be identified as comprising three main provider categories:

Conventional medical practitioners – those core to the biomedical model and medical curriculum. These include: GPs, orthopaedic specialists, neurologists and rheumatologists (Walker, B. F. et al., 2004a; Xue, C, C L et al., 2008).

Allied health care practitioners – those associated with the biomedical model and who traditionally closely assist the conventional medical profession in service provision. These include physiotherapists, nurses and pharmacists (Broom et al., 2012a).

CAM practitioners – those not traditionally associated with biomedicine or the medical curriculum. These include acupuncturists, chiropractors, herbalists, naturopaths, massage therapists, osteopaths, yoga and meditation practitioners, aroma therapists, reflexologists, reiki therapists, traditional Chinese Medicine practitioners and craniosacral therapists (Broom et al., 2012a; Charlie CL Xue et al., 2008).

1.6.1 Conventional back-pain care provision

Back pain sufferers tend to seek help from GPs, with less than 5% of patients seeing specialists for back-pain care (Walker, B, Muller, R. & Grant, W., 2004). An Australian study indicated that 35% of mid-aged women who suffered from back pain consulted a conventional medical practitioner (Broom et al., 2012b).

1.6.1.1 General practitioners

In Australia, GPs are the patient's first point of contact with the healthcare system. In 2012, there were approximately 26,000 GPs in Australia and a survey in 2011 showed that 13% of Australians had consulted a GP at least once in the previous 12 months, 64% had visited at least twice, 37% had visited at least four times and 10% had visited a GP at least 12 times (Australian Institute of Health and Welfare, 2014b). GPs' services cover most of their patients' health-care needs including, diagnosis, prescription of medicines, treatments for management of symptoms and referral to specialists or other health services. As mentioned in Section 1.6.1.1, visits to GPs are paid for by Medicare (covering 85% of individuals' costs), unless the patient is bulk billed.

1.6.1.2 Specialist doctors

In the context of back pain care, orthopaedic specialists, neurologists and rheumatologists are the three main types of specialist doctors in Australia.

Orthopaedic specialists treat conditions pertaining to the musculoskeletal system including bones, joints, muscles, ligaments and tendons by applying medical, physical, and rehabilitation methods as well as through surgery. Patients are referred to an orthopaedic specialist by GPs – especially when back pain is associated with degenerative disc problems and in cases where surgical treatment may become necessary (AOA, 2016).

Neurologists are specialists who treat conditions related to brain functions including certain diseases of the muscles. They usually work in private practice and in hospitals. Presence of neurological symptoms in back pain (e.g. peri-anal sensory loss, leg numbness) is usually due to compression of nerve roots in the *cauda equina* caused by prolapse of a lower lumbar central disc (Kleinig, Brophy & Maher, 2011). In Australia, when GPs elicit neurological symptoms or signs present in patients with back pain, such patients are referred to a neurologist for further assessment and treatment (ANZAN, 2016).

Rheumatologists specialise in the diagnosis and treatment of diseases affecting joints, muscles and bones such as arthritis, autoimmune connective tissue disease, spinal disorders, soft tissue disorders, osteoporosis and chronic musculoskeletal pain conditions (ARA, 2016). When back pain is suspected to have an inflammatory condition as the underlying cause such as *ankylosing spondylitis*. GPs tend to refer the back pain patient to a rheumatologist (Boonen et al., 2005).

1.6.2 Conventional back pain care treatments

Non-specific low back pain, the most common type of back pain (representing 90% of all patients with back pain) is met with some variations in diagnosis and treatment by GPs and specialists despite a general consensus about the clinical guidelines for the management of back pain within, and between, countries (Koes, BW et al., 2010; Koes, B W, Van Tulder & Thomas, 2006). Clinical guidelines for the management of acute or sub-acute and chronic back pain can involve multidisciplinary treatments including exercise and behavioural therapy besides medications (Koes, B W et al., 2010; Koes, BW et al., 2006). Pharmaceutical medications are the most frequently prescribed treatment for back pain (Chou, Roger & Huffman, Laurie Hoyt, 2007). The following section provides an overview of the commonly used medications in back-pain care including prescription only and medications available for purchase over-the-counter.

1.6.2.1 Analgesics

Acetaminophen, an analgesic drug, commonly known as paracetamol, is widely used in back-pain care for its pain relieving property and few side effects (Davies, Maher & Hancock, 2008). Until 2000, clinical guidelines around the world for back-pain care recommended paracetamol as the first line of treatment (Koes, B W et al., 2001). Although non-steroidal, anti-inflammatory drugs have been given prominence in more recently published clinical guidelines, paracetamol is still often mentioned as a useful drug in acute back pain and a drug of choice for short periods in chronic low back pain (Davies et al., 2008). A systematic review of paracetamol for non-specific low back pain found that the effect of paracetamol treatment on pain outcomes was not statistically significant for acute as well as chronic back pain (Davies et al., 2008). Further, this systematic review also found that paracetamol treatment did not show statistically significant improvement in disability for back-pain patients (Davies et al., 2008).

1.6.2.2 Non-steroidal anti-inflammatory drugs (NSAIDs)

Non-steroidal anti-inflammatory drugs have shown to be effective in back pain and are recommended for short-term use in acute, sub-acute and chronic low back pain (Koes, BW et al., 2010). Some commonly used over the counter, as well as prescription NSAIDs, in Australia include aspirin (in brands such as Disprin), ibuprofen (in brands such as Nurofen), naproxen (in brands such as Naprosyn), diclofenac (in brands such as Voltaren) and celecoxib (in brands such as Celebrex) (Department of Health & Human Services, 2015). NSAIDs are used as second choice in back-pain care in cases where paracetamol is not sufficient (Koes, BW et al., 2010). A Cochrane review found that short-term use of NSAIDs was effective in acute low back pain and did not require additional analgesics (Chou, Roger & Huffman, Laurie Hoyt, 2007). In chronic back pain, ibuprofen was found to be effective (Chou, Roger & Huffman, Laurie Hoyt, 2007). There is little data on long-term benefits and harms associated with use of NSAIDs in low back pain and studies report that use of NSAIDs was no more effective than non-pharmacological interventions such as physical therapy or spinal manipulation (Chou, Roger & Huffman, Laurie Hoyt, 2007).

1.6.2.3 Muscle relaxants

The use of muscle relaxants for the treatment of non-specific LBP shows considerable variations in different countries. For example, the clinical guidelines for the treatment of non-specific LBP in many European countries recommend muscle relaxants as the last option after paracetamol and NSAIDs in acute LBP, with Germany and France recommending muscle relaxants for both acute and chronic LBP (Koes, B W. et al., 2010). Muscle relaxants are also commonly recommended for acute LBP in Canada, Finland and the US (Koes, B. et al., 2010). However, in Australia, muscle relaxants are not recommended for acute LBP (Australian Acute Musculoskeletal Pain Guidelines Group, 2003). Muscle relaxants such as dantrolene, baclofen, tizanidine have shown to be efficacious in acute low back pain, and skeletal muscle relaxants have shown to be slightly superior to placebo for short-term use (Chou, Roger & Huffman, Laurie Hoyt, 2007). However, skeletal muscle relaxants are known to be associated with a number of side effects (Chou, Roger & Huffman, Laurie Hoyt, 2007).

1.6.2.4 Antidepressants

The clinical guidelines for the use of antidepressants in the treatment of LBP are explicit – either recommending in some or not recommending their use in other countries. While in Finland, France and Norway antidepressants are recommended for LBP only in cases with a clear diagnosis of depression, in the UK, back pain patients who don't respond to other medications are prescribed tricyclic antidepressants (Koes, BW et al., 2010). In Europe and the US, antidepressants are considered as co-medication for pain relief in chronic LBP (Koes, BW et al., 2010). Australian clinical guidelines do not recommend the use of antidepressants for LBP (Australian Acute Musculoskeletal Pain Guidelines Group, 2003). One systematic review found antidepressants to be more effective than placebo for pain relief in chronic low back pain (Salerno, Browning & Jackson, 2002). However, the effects of different antidepressants on pain relief were inconsistent across trials (Salerno et al., 2002). While tricyclic antidepressants were found to be more effective than placebo for pain relief, paroxetine and trazodone were no more effective than placebo (Salerno et al., 2002). Antidepressants for LBP have been reported to be associated with higher risk for adverse effects compared to placebo and the adverse effects commonly include dry mouth, drowsiness, dizziness and constipation (Chou, Roger & Huffman, Laurie Hoyt, 2007).

1.6.2.5 Opioid analgesics

In many developed nations (i.e. Australia, Austria, Finland, France, Germany, Netherlands, Norway, Spain, UK, US) opioids are the third choice after paracetamol and NSAID for LBP, if pain relief cannot be achieved through other treatments, and opioids are generally used in addition to paracetamol or NSAID (Koes, BW et al., 2010). Opioids are used in chronic LBP in several countries, particularly for sciatica (Koes, BW et al., 2010; Negrini et al., 2006). New Zealand is one of the few countries where opioids are considered harmful in the treatment of LBP (National Health Committee, 2004). A meta-analysis of seven clinical trials indicated low quality evidence that opioids were better than placebo for pain relief and improvement in functional ability (Kuijpers et al., 2011). One study showed very low quality evidence that opioids had no difference in pain relief or improvement in functional ability compared to another NSAID (i.e. naproxen) (Jamison et al., 1998). One study found no significant differences between propoxyphene and placebo (Baratta, 1976) and another study found no significant differences between codeine and acetaminophen for acute back pain (Wiesel et al., 1980). A multicentre, randomised, double blind,

placebo and active-controlled study found that sustained release oxycodone was superior to placebo in chronic back pain (Hale, Dvergsten & Gimbel, 2005). This study found that 85% of LBP patients reported adverse events such as constipation and sedation (Hale et al., 2005).

1.6.2.6 Other therapeutic recommendations by GPs or specialists

Besides prescribing pain medications, conventional medical practitioners, including GPs and specialists, instruct their back-pain patients to be physically active and progressively increase activity levels (Koes, BW et al., 2010). Clinical guidelines on LBP strictly discourage long-term bed rest and restrict bed rest to no longer than two days. Also, there is consensus on not recommending exercise in acute LBP and in recommending supported exercise in chronic LBP. There is much debate on the value of spinal manipulation with some European countries (e.g. UK, Netherlands) suggesting a short course of manipulation in those patients who do not respond to other treatments, some countries (e.g. Austria, Italy) suggesting manipulative therapy as optional, while countries such as Australia do not recommend manipulation as a treatment for LBP (Koes, BW et al., 2010).

1.6.2.7 Invasive procedures for LBP

Invasive treatments are not recommended for non-specific LBP (Koes, B W et al., 2006). Injections of corticosteroid and analgesic administered to the joint facet, prolotherapy, trigger point injections and interdiscal injections for pain relief are in vogue but have shown little effectiveness in comparison to conservative treatment of LBP (van Tulder, M. W. et al., 2006). Surgical intervention is sometimes considered in cases of back pain with degenerative lumbar spondylosis. Surgery in such cases is performed to decompress the nerve root or to fuse the lumbar vertebrae to decrease pain generated from the joint. A study on surgical decompression for spinal stenosis did not find any difference in clinical outcomes between laminectomy and multiple laminectomy (Amundsen et al., 2000). Further studies on surgical treatment for correcting spinal stenosis by using decompression plus fusion or decompression alone have not shown statistically significant outcomes (Carragee, 1997; Postacchini

et al., 1993). In cases of back pain caused by disc prolapse, relieving the irritation on the nerve root or reducing herniation are performed via open discectomy (van Tulder, M. W. et al., 2006). The other less invasive procedures for herniated disc include chemonucleolysis, in which an enzyme such as chymopapain is injected to dissolve the nucleus (van Tulder, M. W. et al., 2006). Chemonucleolysis has shown to have poorer outcomes with some patients needing to undergo second procedure within two years of the initial intervention (van Tulder, MW et al., 2006). A study comparing surgical discectomy with conservative treatment, although showed better outcome at one year, for patients undergoing discectomy, did not show significant differences between the two groups of patients at four years and 10 years (Weber, 1983).

In another prospective study with ten years' observation of patients who underwent discectomy or conservative treatment for lumbar disc herniation, the earlier showed better outcomes at one and four years, but the differences were minimal during the last six years between the surgically treated group and those who underwent conservative treatment (Weber, 2009).

Overall, many patients with back pain consult GPs, a small proportion of back pain sufferers are treated by specialist doctors, and back pain sufferers take analgesics, NSAIDs and/or opioids for pain relief. Certain subgroup of patients may also undergo invasive treatments such as joint facet injections, nerve-decompression and/or fusion operation. Many back-pain sufferers also receive information on being active and use of exercise from conventional medical practitioners. Further, there is interest among GPs in Australia in CAM such as acupuncture and chiropractic (Pirotta, MV et al., 2000). It is also known that GPs refer back-pain sufferers to CAM practitioners and some GPs provide acupuncture treatment (Cohen, MM et al., 2005; Easthope, Gary et al., 1998).

1.6.3 Allied health care provision for back pain

As already discussed, allied health-care providers for back pain include physiotherapists, nurses and pharmacists. Physiotherapists in Australia use physical treatments to manage a range of disorders of movement and to assist their patients in regaining optimal function (Australian Physiotherapy Association, 2014). Many physiotherapists are trained to support patients with musculoskeletal conditions

(Australian Physiotherapy Association, 2014). An Australian population based study revealed that 8% of Australian adults with back pain had visited a physiotherapist only for their back pain (Walker, BF. et al., 2004a). Physiotherapists focus on assessing disabilities and participation problems in back pain sufferers and educate patients on active lifestyle and exercise therapy (Bekkering et al., 2003). Physiotherapists encourage back pain sufferers to gradually increase activities or participation in a time-contingent manner and assist in decreasing pain behaviour (Bekkering et al., 2003). Studies have shown that combined back-pain care education and physiotherapy produce improvement in pain, disability and quality of life (Moseley, 2002).

In Australia, nurse practitioners are registered under the Nursing and Midwifery Board of Australia (NMBA) and are able to prescribe schedule 2 drugs (e.g. paracetamol) besides providing patient education (Nursing and Midwifery Board of Australia, 2013; Primary Health Care Research & Information Service, 2012). The positive and influential role of nurses in educating patients on self-care in back pain, patient education in invasive treatments for back pain and patient counselling is well documented (Hartley, Neubrandner & Repede, 2012).

Pharmacists in Australia play an important role in dispensing prescriptions, counselling customers on over-the-counter medications and educating customers on prevention and health promotion (Pharmaceutical Society of Australia, 2014). Pharmacists work as consultant pharmacists, community pharmacists or hospital pharmacists across Australia (Pharmaceutical Society of Australia, 2014). Pharmacists can provide over-the-counter analgesics and NSAIDs (where appropriate) for customers with back pain and pharmacists being accessible without prior appointments, are well positioned to readily offer information and/or advice on back pain care (Silcock et al., 2007). Pharmacists can also play an important role in referring back-pain sufferers to medical or other back-pain care providers. A study on community pharmacists in England showed that pharmacists had adequate knowledge to provide evidence based advice on back pain and back pain care and pharmacists felt that they would benefit from further training to offer support for self-care in back pain (Silcock et al., 2007).

Overall, allied health care providers give information on self-care for back pain, advise on activity/exercise, prescribe/counsel on pain relieving medications (mainly nurses and pharmacists), offer physical treatment (mainly physiotherapists) for improving

physical functioning and improving disability associated with back pain besides referring back pain sufferers to other back pain care providers. An Australian study of middle-aged women showed that women with back pain were more likely to consult a physiotherapist if they had also consulted a CAM practitioner (Broom et al., 2012b) indicating possible cross-referrals between the two professions. A UK study reported that more than half of the physiotherapists who responded to the survey had used CAM when treating LBP and acupuncture, massage, craniosacral therapy, reflexology and aromatherapy were among the CAM used by physiotherapists (Hughes, C. et al., 2011). Nurses have been shown to be open to CAM and a study from Australia found that nurses used CAM such as yoga, meditation, supplements, aromatherapy in their practice (Shorofi & Arbon, 2010). Pharmacists seem to be the most suitable health professionals to inform consumers about CAM products, and studies have shown that pharmacists quite frequently counsel consumers on CAM products (Boon et al., 2009; Farrell, Ries & Boon, 2008).

1.7 Complementary and alternative medicine back pain care provision and providers

As already covered, the use of CAM is widespread among women with back pain. CAM providers in Australia can receive training from a range of educational providers at universities and vocational training institutions comprising of diploma, bachelors and masters' degrees (The Australian National Register of Accredited Natural Therapists, 2015). CAM practitioners trained outside Australia, who fulfil the criteria set by the various Australian CAM professional regulatory bodies, are also able to practice in Australia (Australian Health Practitioner Regulation Agency, 2015). In the following section, nine types of CAM modalities, including CAM practitioner groups (acupuncturists, chiropractors, osteopaths, herbalist, naturopath, massage therapists) and CAM therapies or products (including herbal medicines, vitamins, minerals, supplements, yoga, meditation, aromatherapy oils) are discussed in detail.

1.7.1 The role and practice of massage therapy in back-pain care

Massage therapy involves manually working on soft tissue by applying pressure to the muscles, tendons, ligaments and fascia (Australian Association of Massage Therapists, 2015). Massage therapists generally treat patients presenting with sub-acute or chronic pain, stress and anxiety, and assist in rehabilitation and health maintenance (Australian Association of Massage Therapists, 2015). A wide range of modalities fall within the remit of massage therapy in Australia, these include acupressure, applied kinesiology, craniosacral therapy, neuromuscular therapy, postural integration and reflexology. Massage therapists with special training can practice techniques deemed potentially high-risk such as aromatherapy and manual lymphatic drainage (Australian Association of Massage Therapists, 2015).

Massage therapy is a self-regulated profession in Australia and massage therapists are required to be members of a professional association in order for their clients to be eligible to claim private health insurance rebates. A systematic review of massage therapy for back pain concluded that massage can be beneficial in sub-acute and chronic low back pain in conjunction with exercise and education (Furlan et al., 2002).

1.7.2 The role and practice of naturopathy and herbal medicine in back-pain care

Naturopathic medicine is defined through a set of principles and a philosophy that range around ideas of recognising the body's innate healing ability, known as the healing power of nature (*Vis Medicatrix Naturae*); identifying and treating causes of illness (*Tolle Causam*) and of not doing harm (*Primum Non Nocere*) and naturopathic practitioners see an important part of their role as educating patients by emphasising self-responsibility for health (American Association of Naturopathic Physicians, 2014). Naturopaths in Australia apply naturopathic principles and philosophy in their practice by utilising a range of modalities (as single or multiple modalities) including herbal medicine, nutritional medicine, massage and homeopathy (Lin et al., 2009). Herbal medicine has become a core modality in naturopathic practice in Australia and practitioners engage in compounding herbal medicines in their treatment approach (Bensoussan et al., 2004; Lin et al., 2009).

Naturopathy and herbalism in Australia is a self-regulated profession with five major professional associations representing naturopathic practitioners; the Australian Naturopathic Practitioners Association (ANPA), Australian Natural Therapists Association (ANTA), Australian Traditional Medicine Society (ATMS), Federation of Natural and Traditional Therapists (FNTT), and National Herbalists Association of Australia (NHAA) (Lin et al., 2009; Wardle, J, Steel & Adams, 2012). An Australian study showed that 53% of middle-aged women had consulted a naturopath or herbalist for back pain (Adams, Sibbritt & Young, 2007).

1.7.3 The role and practice of chiropractic in back-pain care

Chiropractic involves diagnosis, treatment and prevention of mechanical disorders of the musculoskeletal system and the effects of these disorders on general health (Chiropractors' Association of Australia, 2016; WHO, 2005). Chiropractic is based on the concept that mechanical spinal functional disturbances affect neurophysiological functions thereby affecting the musculoskeletal system as well as negatively impacting on one's health in general (American Chiropractic Association, 2016; World Health Organization, 2005). The word chiropractic is derived from the Greek words *cheir*, meaning hand, and *parktos*, meaning done (i.e. done by hand), mainly referring to performing joint adjustment and spinal manipulation (American Chiropractic Association, 2016; World Health Organization, 2005). Chiropractors mainly treat conditions related to the spine such as neck pain and low back pain, and some chiropractors also treat other conditions (e.g. irritable bowel syndrome, asthma) (National Health Service, 2014).

There is good evidence that chiropractic manual therapy involving spinal manipulation can be effective in the treatment of low back pain (Globe et al., 2016; National Health Service, 2014). In Australia, chiropractic qualifications are nationally accredited and chiropractors are nationally registered (Chiropractors' Association of Australia, 2016), and as such, chiropractic is a regulated health care profession in Australia. An Australian study showed that 33% of mid-aged women who sought help for back pain had consulted a chiropractor (Broom et al., 2012a).

1.7.4 The role and practice of osteopathy in back-pain care

Osteopathy is a form of manual healthcare based on the principle that an individual's wellbeing is linked to the optimal functioning of bones, muscles, ligaments and connective tissue (National Health Service, 2015; Osteopathy Australia, 2014). Osteopaths use a range of hands-on techniques to diagnose and evaluate the patient, and use physical manipulation, massage and stretching with the aim of increasing joint mobility, relieving muscle tension, enhancing blood supply to tissues thereby helping the body to heal (National Health Service, 2015; Osteopathy Australia, 2014). Although there is little evidence on the effectiveness of osteopathy for conditions not directly related to muscles, bones and joints (e.g. migraines, dysmenorrhea), osteopathy is known to be effective for the treatment of low back pain (Licciardone, J. et al., 2005; National Health Service, 2015).

In Australia, osteopathy is nationally regulated and osteopaths work in private practice (Australian Health Practitioner Regulation Agency, 2015; Osteopathy Australia, 2014). Patients receiving osteopathic treatments can claim private health insurance rebates. Osteopathic treatment for chronic back pain is covered by Medicare's Chronic Disease Management plans (osteopathy Australia). A national population survey of Australian adults showed that 4.6% of the surveyed sample (n=1,067) had used osteopathy and of them 48.4% had utilised osteopathic manipulation for back pain and related problems (Charlie CL Xue et al., 2008). In 2004 and 2007, 8% of mid-aged Australian women had consulted an osteopath for their back pain (Broom et al., 2012a).

1.7.5 The role and practice of acupuncture in back-pain care

Acupuncture is a form of traditional Chinese medicine involving insertion of fine needles into specific sites on the surface of the skin called acupuncture points, and known in traditional Chinese medicine as meridians, in order to clear energy blockages and encourage flow of energy (called *qi* in Chinese medicine) in the individual (Australian Acupuncture & Chinese Medicine Association, 2016).

Acupuncturists in Australia treat a wide range of conditions including back pain and back pain sufferers in Australia are known to seek help from acupuncturists (Walker, BF, et al., 2004a). In the year 2007, 10% of middle-aged Australian women with back pain had consulted an acupuncturist for their back pain (Broom et al., 2012a). There

is evidence that acupuncture is effective for pain relief and functional improvement in chronic low back pain (Furlan et al., 2005).

Acupuncturists in Australia are nationally registered and practitioners can register with the Chinese Medicine Board of Australia within the divisions of acupuncture, Chinese herbal medicine and Chinese herbal dispensing (Australian Health Practitioner Regulation Agency, 2015; Zheng, 2014). In addition, medical practitioners (i.e. GPs or specialists) who meet the requirements of the Medical Board of Australia's registration standard can apply for endorsement of registration as acupuncturists in order to provide treatment (Medical Board of Australia, 2014).

1.7.6 The role and practice of yoga/meditation in back-pain care

Yoga, with its roots in ancient Indian scriptures and philosophical schools, aims at bringing about balance between energy systems within the body by the practice of specific postures (*asana*), breathing techniques (*pranayama*), subtle gestures directing energy flow (*mudra*) and 'muscular and energetic locks' (*bandha*) (Penman, 2008). Meditation is an integral part of philosophy of yoga and its practice can either be as part of practices involving physical postures or without any physical practice of postures, therefore yoga and meditation are usually considered together (Penman, 2008). Yoga and meditation are widely practiced as self-care and yoga is practiced as yoga therapy in a therapist-client setting by using specific yoga practices for achieving health and well-being outcomes (Penman, 2008; Yang, 2007).

In Australia, yoga is mostly practiced as a form of exercise facilitated by yoga instructors to individuals or groups. Yoga is not regulated nationally or by federal states in Australia and there are a number of yoga professional associations, mostly loosely regulating training standards with yoga therapy training being formally established since 2007 (Penman, 2008). A small number of private health insurers cover individuals for taking yoga classes when referred by a GP or allied health care professional with the purpose of improving well-being (Yoga Alliance International, 2014). Yoga is seen as a relatively safe and beneficial practice with two thirds of Australian GPs recommending or referring patients to yoga/meditation practice (Cohen, .M et al., 2005). Women are greater users of yoga than men and 22% of Australian women aged 56-61 years used yoga or meditation for their back pain in the

2007 (Broom et al., 2012a). A randomised trial found that a 12-week yoga programme for adults with chronic low back pain improved back-pain patients' functioning more than usual care (Tilbrook et al., 2011). A systematic review of seven randomised controlled clinical trials found that while five clinical trials showed greater reduction in low back pain with yoga in comparison to usual care, two RCTs showed no significant differences between the two groups (Posadzki & Ernst, 2011).

1.7.7 The role and use of vitamins and minerals in back-pain care

Vitamins are organic compounds needed by the body in small amounts and form two of the six classes of nutrients, the other four being carbohydrates, proteins, lipids and water (Wardlaw & Smith, M, 2009). Vitamins support growth, development and maintenance of the body, and are essential for various physiological functions. Vitamin A, D, E and K are fat-soluble vitamins and Vitamin C, and B Vitamins (i.e. Thiamin, Riboflavin, Niacin, Pantothenic acid, Biotin, Vitamin B-6, Folate, Vitamin B-12) are water-soluble (Wardlaw & Smith, 2009). Diet is the main recommended source of vitamins for most of the population with a small group of people needing supplementation for certain health conditions (Wardlaw & Smith, 2009).

Minerals are inorganic substances essential for the functioning of the nervous system, cellular processes, water balance and structural systems (e.g. musculo-skeletal) (Wardlaw & SmithM, 2009). With 16 or more essential minerals required from the diet for good health, the major minerals comprise of sodium, chloride, potassium, calcium, phosphorus, magnesium and sulphur, and trace minerals comprise of iron, zinc, iodine, selenium, copper, manganese, fluoride, chromium and molybdenum (Wardlaw & SmithM, 2009).

Although there is weak evidence for back-pain sufferers needing vitamin supplementation in general, there is evidence that in those with chronic back pain, and who are vitamin D deficient, repletion of vitamin D has been shown to improve symptoms and quality of life (Schwalfenberg, 2009). While there is little research on the effects of specific vitamins or minerals on back pain, most research in this area has examined combinations of vitamins and/or minerals in joint pain associated with inflammatory causes (Ameye & Chee, 2006). As such, there is lack of evidence for the benefit of vitamins/minerals in back pain care. In Australia, it is known that back pain sufferers, particularly mid-aged women are more likely to self-prescribe

vitamins/minerals if they seek help for back pain than those women who don't seek help for their back pain (Broom et al., 2012a).

1.7.8 The role and use of herbal medicines in back-pain care

Herbal medicines in Australia refer mainly to herbs from western herbal medicine based on European and American traditions of herbal medicine and, to a smaller extent, herbs from traditional Chinese medicine (Wohlmuth, Oliver & Nathan, 2002). Herbal medicines are dispensed by herbalists/naturopaths or can be purchased as over-the-counter products in Australia. While herbalists and naturopaths dispense largely liquid herbal extracts (manufactured for practitioner only use) within the context of a holistic clinical framework, a wide range of other herbal dosage forms such as capsules or tablets are available for purchase by the general public (Wohlmuth et al., 2002). As mentioned previously, herbal medicines are regulated by the Therapeutic Goods Act 1989 (Therapeutic Goods Administration, 2016). In Australia, over-the-counter herbal products must be listed under the Therapeutic Goods Administration (TGA) and manufacturers of herbal medicines are required to hold a Good Manufacturing Practice (GMP) license (Therapeutic Goods Administration, 2016; Wohlmuth et al., 2002). It is estimated that 10% of the herbal medicine retail market comes from herbal medicines prescribed by practitioners – the majority of herbal medicines (worth A\$ 200 million/annum) are sold as over-the-counter products in supermarkets, pharmacies, health food stores and through mail-orders (Wohlmuth et al., 2002). Systematic reviews on efficacy of herbal medicines in chronic low back pain has shown strong evidence for avocado soybean fraction and Harpagophytum preparations, moderate evidence for ginger and rose hip seed powder, and insufficient evidence for Boswellia serrata and willow bark extract (Chrubasik, Roufogalis & Chrubasik, 2007). An Australian study of mid-aged women with back pain showed that back-pain sufferers who sought help for their back pain were more likely to self-prescribe herbal medicine than those who did not seek help for their back pain (Broom et al., 2012a).

1.7.9 The role and use of supplements in back-pain care

The term supplements in this thesis refers to dietary supplements or nutritional supplements such as glucosamine or fish oil, which do not strictly fall within the categories of vitamins, minerals or herbal medicines. From the regulatory viewpoint, these mentioned products are classified as complementary medicines according to the Therapeutic Goods Act 1989. In Australia, a product that principally contains one or more of the ingredients listed here is classified as complementary medicine; an amino acid, charcoal, a choline salt, an essential oil, a plant/herbal material (e.g. plant fibres, enzymes, algae, fungi, chlorophyll), a homeopathic preparation, a microorganism (except a vaccine), a mineral/mineral salt, a mucopolysaccharide, non-human animal material (e.g. fats, oils), a lipid (e.g. essential fatty acid), bee products, a sugar (e.g. polysaccharide) or a vitamin (Therapeutic Goods Administration, 2013). As such the regulatory framework for supplements is the same as for vitamins, minerals and herbal medicines as described previously in this chapter (see Sections 1.7.7 & 1.7.8).

A number of supplements containing fish oils, DL-Phenylalanine (DLPA), Silica, Boron, Glucosamine sulphate or Chondrotin sulphate are said to be helpful in back-pain care (Balch, 2006). A population study found that use of fish-oils was specifically linked with chronic low back pain, although there is little evidence for its benefit in back pain (Harrison et al., 2004). DLPA despite showing analgesic property in laboratory studies, failed to show improvement in pain in a clinical study on patients with chronic back pain (Nathan & Eisenberg, 1987). There is much debate on the usefulness of Glucosamine sulphate or Chondrotin sulphate in treating back pain, although several small studies have shown these substances to have potential chondroprotective property deemed to be beneficial in degenerative joint disease causing back pain (Brief, Maurer & Di Cesare, 2001).

1.7.10 The role and use of aromatherapy oils in back-pain care

Aromatherapy oils are also called essential oils, and are obtained from aromatic plants by steam distillation or by mechanically expressing citrus fruits (Battaglia, 2003; Buckle, 1999). The therapeutic use of essential oils is called aromatherapy and essential oils are administered via application to the skin, inhaled as vapour or taken internally (International Aromatherapy & Aromatic Medicine Association, 2014). When

aromatherapy oils are ingested, such application falls within the remit of herbal medicine. Essential oils are used by qualified aroma therapists, usually for massage or are self-administered using essential oils available from supermarkets, health food stores and pharmacies, the latter being the most prevalent form of aromatherapy oil utilisation in Australia (International Aromatherapy & Aromatic Medicine Association, 2014). Aromatherapy oils are commonly used for pain management and the pain relieving effect is assumed to be the result of relaxation produced by inhaling or application of essential oils via massaging (Buckle, 1999; Long, Huntley & Ernst, 2001). Although the analgesic properties of certain essential oils have been shown in laboratory studies, there is little evidence on the clinical benefits of aromatherapy (Lee, M. S. et al., 2012). Self-administration of aromatherapy oils is common in Australia and a national population study showed that 16.1% of Australians had reported using aromatherapy (Xue, CCL et al., 2007). An Australian study on mid-aged women with back pain showed that women who sought help for their back pain were significantly more likely to self-prescribe aromatherapy oils than women who did not seek help for their back pain (Broom et al., 2012a).

1.8 Chapter summary

This chapter has reviewed detailed background information on the wider context of CAM, wider context of back pain care, general CAM use and CAM users' characteristics, back pain and back-pain related symptoms, CAM practitioner registration, CAM products regulation, and private health insurance coverage of CAM. This chapter has also presented an overview of all the types of conventional, allied health and CAM providers and CAM provision for back pain care in the context of Australian health system. The chapter highlighted that little knowledge is available on women's consultations with CAM practitioners and knowledge on self-prescribed CAM treatments for back pain in Australia despite back pain among women being a significant public health and health service issue.

2 Literature review

2.1 Chapter introduction

The purpose of this chapter is to provide a detailed overview of the current international literature on the use of complementary and alternative medicine (CAM) for back pain further to what has already been identified as the key issues in the Background Chapter. The integrative literature review was conducted parallel to analysing field data collected via the survey, which provided a framework for deepening the discussion of the individual research questions in the published papers forming Chapters 4,5,6 and 7. The chapter addresses the Research Question 1 outlined in Chapter 1, Section 1.3.2, 1.a) and 1.3.2, 1.b) and presents the findings from undertaking an integrative review of international literature on the use of CAM for back pain. Examining the literature on CAM use for back pain requires inquiry into prevalence of CAM use and profiles of CAM users. Further, exploring determinants of CAM use for back pain by reviewing scientific literature is important within the context of Health Services Research (HSR). This includes an understating of factors influencing decision-making on CAM use such as reasons for CAM use, back pain sufferers' self-reported effectiveness of CAM, back pain sufferers' communication with health care providers regarding their CAM use and referrals for CAM treatments from conventional medical practitioners.

With this in mind, this chapter presents the results of an integrative review of 30 peer-reviewed articles published in English between the years 2000 and 2014, which were selected based upon a search criteria outlined in Section 2.2.2.1. The results contained within this chapter have been published as follows:

Murthy V, Sibbritt D, Adams J. An integrative review of complementary and alternative medicine use for back pain: a focus on prevalence, reasons for use, influential factors, self-prescribed effectiveness, and communication. *The Spine Journal* 2015; 15 (8): 1870-1883.

A copy of the manuscript is attached to this thesis as Appendix 4.

2.1.1 A note about inclusion of two articles from the main research project

As this thesis is by a series of publications and the data relating to the main research project on Australian women's use of CAM for back pain was analysed very close to the submission of the draft literature review manuscript submission, two articles (see Appendix 5 and Appendix 6) from the four articles forming the findings chapters of this thesis had to be included in the integrative review published in *The Spine Journal*.

2.2 An integrative review of complementary and alternative medicine use for back pain: a focus on prevalence, reasons for use, influential factors, self-perceived effectiveness, and communication

2.2.1 Introduction

Complementary and alternative medicine (CAM) refers to a broad range of healing modalities external to the biomedical models of health care with an array of non-prescription products and health-care services not linked to the medical profession or the medical curriculum (Adams et al., 2012; Adams, Easthope & Sibbritt, 2003; Steel et al., 2012). Despite lacking evidence base, CAM has become widely available internationally and has become popular in recent years in Australia and United States among many other countries (Eisenberg, David M et al., 2012; Sibbritt, D. W., Adams & Young, 2005). Complementary and alternative medicine and its use have become the topic of significant international public health investigation (Baer, 2008; Adams, 2008), and the use of CAM in the treatment of chronic health conditions such as "back pain" (van Tulder, M. et al., 2000) has become a significant health service issue.

Back pain is the most prevalent of musculoskeletal conditions and is the second most common complaint in general practice (Bridges-Webb et al., 1993; Cypress, 1983; Hart, Deyo & Cherkin, 1995; Sibbritt, D. W., & Adams, J., 2010; Walker, B. F. et al., 2004a) with a lifetime prevalence of up to 75% affecting a large proportion of the adult population (Andersson, 1999; Deyo & Yuh-Jane, 1987; Nachemson, Waddell & Norlund, 2000; Walker, B. F., Muller, R. & Grant, W. D., 2004a). Back pain poses

major constraints on individuals, health systems, and social care systems across developed countries (Buchbinder, Jolley & Wyatt 2001; Kent & Keating, 2005; Maetzel & Li, 2002; Schmidt et al., 2007; Thomas et al., 2001; Woolf & Pfleger, 2003). Non-steroidal anti-inflammatory drugs, although effective for symptomatic pain relief in back pain, have shown more adverse effects than paracetamol during long-term use (van Tulder, M. et al., 2000). As unresolved back pain results in reduced physical function and psychological distress (Pengel et al., 2003), back pain sufferers tend to explore a wide range of treatments, including CAM (Breivik et al., 2006; Chenot et al., 2007; Haetzman et al., 2003; Kirby et al., 2014; Kirby, Broom, Sibbritt, Adams, et al., 2013; Kirby, Broom, Sibbritt, Refshauge, et al., 2013; Mortimer & Ahlberg, 2003; Sibbritt, D. W., & Adams, J., 2010; van Dulmen et al., 2010; Xue, C., C L et al., 2008). Although evidence for CAM treatments in back pain is inconclusive (Furlan et al., 2008; Furlan et al., 2005; Gagnier, J. et al., 2006; Licciardone, J. et al., 2005; Rubinstein, S. M. et al., 2011; Walker, B. F. et al., 2010; Weiner, D. K. & Ernst, 2004; Williams, K. et al., 2009), a wide range of CAM treatments are available in the market place consisting of practitioner-based CAM treatments (e.g. acupuncture, chiropractic, and massage) and self-prescribed CAM for back pain (e.g. vitamins, supplements, and aromatherapy oils) (Artus, Croft & Lewis, 2007; Broom et al., 2012a; Chenot et al., 2007; Fleming et al., 2007; Haetzman et al., 2003; Kirby, Broom, Sibbritt, Adams, et al., 2013; Mortimer & Ahlberg, 2003; Ong, C. K. et al., 2004; Shmueli, A., Igudin & Shuval, 2011; Sibbritt, D. W., & Adams, J., 2010; Wade et al., 2008; Xue, C., C L et al., 2008).

Although the treatment for back pain is known to be a continuing challenge and that back-pain sufferers are likely to explore multiple treatments, to date, there has been no integrative review on prevalence of CAM use, characteristics of CAM users, CAM users' decision making, self-perceived effectiveness of CAM in back pain, and users' communication about CAM use with health-care providers. In response, this article provides the first synopsis and evaluation of CAM use for back pain by reviewing research findings from the recent international empirical literature. This article aims to identify relevant studies that investigate the use of CAM for back pain, analyse the quality of these studies, report key findings from these studies employing a theme-based analysis, and highlight gaps in the current literature and make recommendations for future research on this important health service issue.

2.2.2 Methods

2.2.2.1 Search Design

The MEDLINE, CINHALL, AMED (Allied and Complementary Medicine database), DARE, EMBASE, Excerpta Medica, psycINFO, and SCOPUS databases were searched for articles published from 2000 to 2014 using the following keywords and phrases: “back pain” OR “low back ache” AND “complementary medicine” OR “complementary therapies” OR “alternative medicine” OR “alternative therapies” OR “manipulative therapies” OR CAM OR chiropract* OR massage OR osteopath* OR yoga OR naturopath* OR herbal* OR aromatherapy OR “Chinese medicine” OR homeopathy OR acupuncture OR prayer OR supplement* OR meditation. The CINHALL, MEDLINE, and DARE are the most popular databases for health scholarship, whereas the AMED database provides an important resource focused specifically on allied health and CAM scholarship.

The search results were imported into EndNote X6 (Thomson Reuters, New York, NY, USA), a bibliographic management system software program. All duplicate items were removed, and the remaining articles were screened and assessed by titles and abstracts. Articles included in the review were required to be peer-reviewed, research based articles reporting new empirical findings with a focus on CAM use among people with back pain or CAM use among a broader population (where CAM use for back pain is clearly identifiable). Individual case reports and CAM clinical trials on back pain were excluded from the review. In those circumstances where an abstract provided insufficient detail with which to assess the manuscript, the full article was retrieved and examined to make a final decision regarding inclusion or exclusion status.

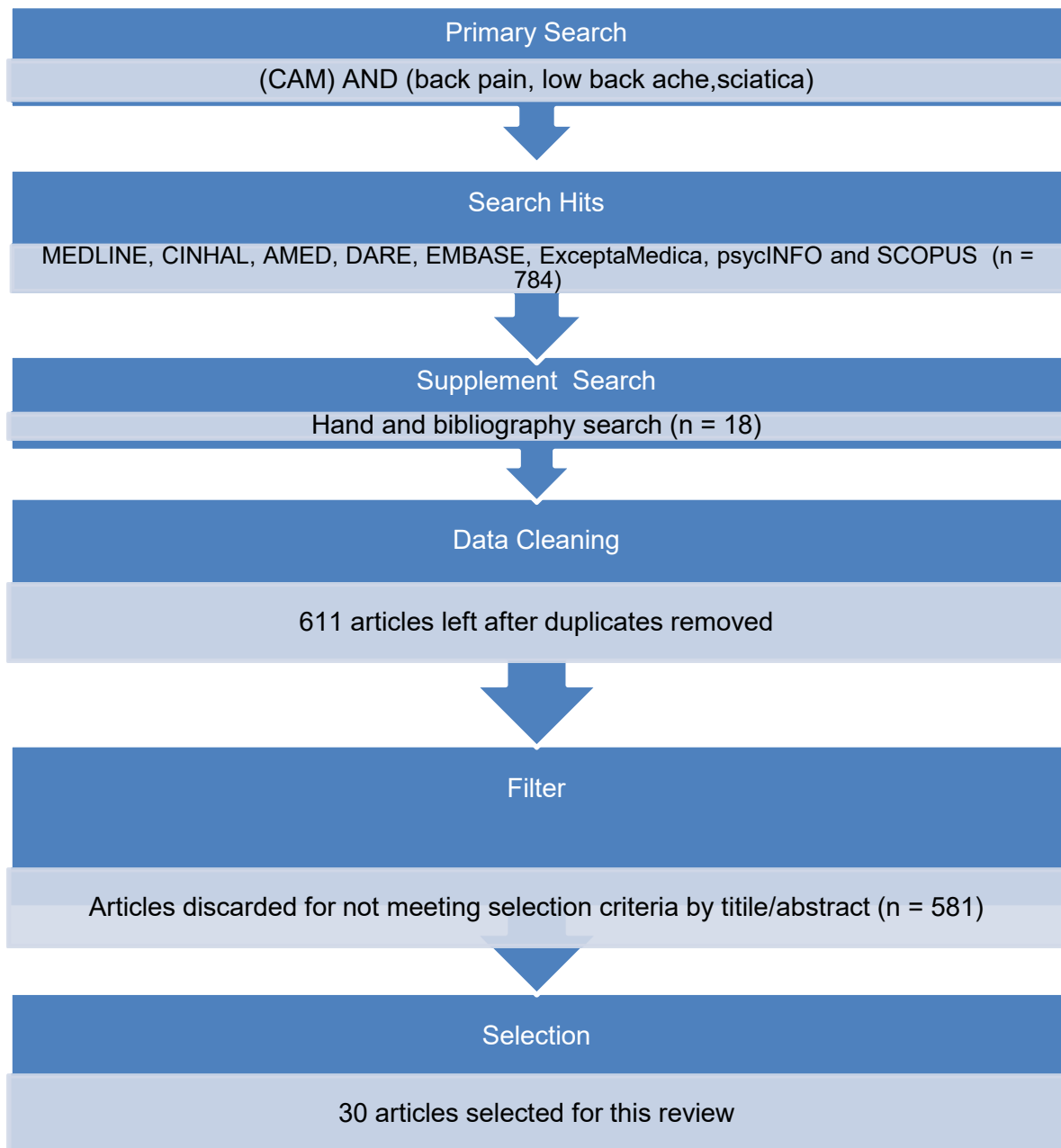
To ensure all relevant literature on CAM use for back pain were identified, the authors also conducted hand searches in relevant peer-reviewed journals such as Spine, Clinical Rheumatology and Complementary Therapies in Medicine. Relevant works

were also searched in Google Scholar and by examining bibliographies of already identified publications as another means of ensuring the rigor of the search.

2.2.2.2 Search Outcomes

The initial search identified 611 articles. Of these, a total of 30 articles met the strict selection criteria and were included in the review. The Figure 1 reports the steps of literature search, and Table 2.1 provides general information on each article included in this review.

Figure 1: Flowchart of Literature Search Steps



2.2.2.3 Quality Appraisal

To appraise the quality of the studies selected for review, the authors used a quality scoring system (Table 2.2) previously used for assessing prevalence studies on neck pain (Fejer, Kyvik & Hartvigsen, 2006), CAM use among cancer patients (Bishop, F L et al., 2011), and CAM use among headache and migraine patients (Adams, Barbary & Lui, 2013). The use of this analytical tool allowed for systematic evaluation and comparison of the identified studies. Two authors assigned scores to the studies separately; the results were then compared and differences resolved by discussion. The quality scores of each study are reported in Table 2.3.

Table 2.1 Research-based studies on Complementary and Alternative Medicine (CAM) use for back pain, 2000-2014

Author(s)/ Year/Country	Research focus	CAM Modality	Design, Sample size (n), study setting
(Xue, C., C L et al., 2008)/Australia	User profile, reasons for use, decision-making, self-perceived effectiveness.	Acupuncture, chiropractic, osteopathy.	Cross-sectional (n=1,067), Population
(Côté et al., 2001) /Canada	User profile & reasons for CAM use.	Chiropractic, massage therapy.	Cross-sectional (n=1,131), Population
(Ong, C. K. et al., 2004)/UK	Prevalence, profile, reasons for CAM use.	Chiropractic, osteopathy.	Cross-sectional (n=8,889), Population
(Wade et al., 2008)/USA	Prevalence, profile, reasons and decision-making on CAM use.	Acupuncture, chiropractic, homeopathy, massage, medicinal herbs, prayer, tai chi, vitamins/nutritional supplements, yoga/meditation.	Cross-sectional (n=808), Population
(Broom et al., 2012a)/Australia	Prevalence, profile, reasons for CAM use.	Acupuncture, aromatherapy oils, Chinese medicine, chiropractic, herbal medicines, massage therapy, meditation/yoga, naturopath/herbalist, osteopathy, vitamins/minerals.	Cross-sectional (n=9,820), Population
(Ong, C. et al., 2002)/UK	Prevalence, profile, reasons for CAM use.	Acupuncture, herbal medicine, homeopathy, osteopathy/chiropractic, spiritual healing.	Cross-sectional (n=8,889), Population
(Shmueli, A et al., 2011)/Israel	Prevalence, profile, reasons for CAM use, decision-making & effectiveness.	Acupuncture, biofeedback, chiropractic, homeopathy, naturopathy, reflexology.	Cross-sectional (n=2,505), Population
(Broom et al., 2012b)/Australia	Prevalence, reasons for CAM use.	Acupuncture, chiropractor, massage therapy, naturopath/herbalist, osteopath.	Cross-sectional (n=10,492), Population
(Millar, 2001)/Canada	Prevalence, profile, reasons for use, decision-making on CAM use.	Acupuncture, chiropractic, homeopathy, massage therapy, naturopathy.	Longitudinal (n=22,568), Population
(Kanodia et al., 2010)/USA	Prevalence, profile, reasons for use, communication & effectiveness.	Acupuncture, chiropractic, herbal medicines, massage, qi gong, relaxation techniques, tai chi, yoga.	Cross-sectional (n= 31,044), Population
(Saper et al., 2004)/USA	Profile, reasons for use & self-perceived effectiveness.	Yoga	Cross-sectional (n=2,055), Population
(Sibbritt, D, Adams & Van der Riet, 2011)/Australia	Profile & reasons for use.	Meditation & Yoga.	Longitudinal (n=19,209), Population
(McCaffrey et al., 2004)/USA	Profile, reasons for use & self-perceived effectiveness.	Prayer	Cross-sectional (n= 2,055), Population
(McGrady & Betz, 2008)/USA	Profile & reasons for use.	Acupuncture	Cross-sectional (n=7,371), Population
(Wolsko et al., 2003)/USA	Self-perceived effectiveness.	Chiropractic, massage, relaxation therapy.	Cross-sectional (n=2,055), Population
(Murthy et al., 2014a)/Australia	Prevalence, profile & reasons for CAM use.	Acupuncture, chiropractic, massage therapist, meditation/yoga practitioner, naturopath/herbalist, osteopathy.	Cross-sectional (n=1,310), Population
(Murthy et al.,	Prevalence, profile & reasons for CAM use.	Aromatherapy oils, herbal medicines, meditation/yoga,	Cross-sectional (n=1,310),

2014b)/Australia		supplements. vitamins/minerals.	Population
(Kirby, Broom, Sibbritt, Adams, et al., 2013)/Australia	Prevalence, profile, reasons for use, decision-making & communication.	Acupuncturist, chiropractor, herbalist/naturopath, massage therapist, osteopath.	Cross-sectional (n=1,310), Population
(Sherman, K. J. et al., 2004)/USA	Prevalence, profile, reasons for use, decision-making & effectiveness.	Chiropractic, massage, meditation, tai chi.	Cross-sectional (n=249), Clinical
(Chenot et al., 2007)/Germany	Prevalence, profile, reasons for use, decision-making & communication.	Acupuncture, cupping, homeopathy, local heat, massage, naturopathy, osteopathy, spinal manipulation.	Longitudinal (n=1,342), Clinical
(Gaul et al., 2011)/Germany	Prevalence, profile, reasons for use, decision-making & communication.	Acupuncture, massage therapy, thermotherapy.	Cross-sectional (n=432), Clinical
(Chenot et al., 2006)/Germany	Prevalence, reasons for use, effectiveness & communication.	Acupuncture, massage.	Longitudinal (n=1,218), Clinical
(Hartvigsen et al., 2002)/Denmark	Reasons for use & decision-making.	Chiropractic	Cross-sectional (n=1,897), Clinical
(Ailliet, Rubinstein & de Vet, 2010)/Belgium	Profile, reasons for use, decision-making & self-perceived effectiveness.	Chiropractic	Cross-sectional (n=517), Clinical
(Fleming et al., 2007)/Germany	Prevalence, profile, reasons for use & self-perceived effectiveness.	Acupressure, acupuncture, chiropractic, craniosacral therapy, herbs/supplements, massage, meditation, prolotherapy, yoga.	Cross-sectional (n=908), Clinical
(Palinkas & Kabongo, 2000)/USA	Profile, reasons for use, decision-making & self-perceived effectiveness.	Acupuncture, chiropractic, herbal medicines, homeopathy, massage, meditation, naturopathy, supplements.	Cross-sectional (n=542), Clinical
(Peleg et al., 2011)/Israel	Prevalence, profile, reasons for use, & self-perceived effectiveness.	Acupuncture, chiropractic, herbal medicine, homeopathy, massage therapy, naturopathy, reflexology, shiatsu.	Cross-sectional (n=163), Clinical
(Ho, Jones & Gan, 2009)/Singapore	Prolife & reasons for use.	Massage therapy, spiritual healing, vitamins/supplements.	Cross-sectional (n=92), Clinical
(Coulter et al., 2002)/USA	Prevalence, profile, reasons for use, & self-perceived effectiveness.	Chiropractic	Cross-sectional (n=1,275), Clinical
(Gkolfinopoulos, Byfield & McCarthy, 2003)/UK	Profile.	Chiropractic	Cross-sectional (n=1,000), Clinical

Table 2.2 Description of quality scoring system for the complementary and alternative medicine studies reviewed

Dimensions of Quality Assessment	Points Awarded*
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 past 12 months)	1
Reporting of participants' characteristics:	
E. Back pain specific	1
F. Age	1
G. Ethnicity	1
H. Indicator of socioeconomic status (e.g. income and 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

CAM, Complementary and Alternative Medicine.

Note: Adopted from Fejer et al (Fejer et al., 2006) Bishop et al (Bishop, F L et al., 2011), and Adams et al (Adams, J et al., 2013).

* Maximum score: 11 points

Table 2.3 Quality score of studies on complementary and alternative medicine use for back pain

Author(s)/Year	Dimensions of Quality Assessment			Total Score
	Methodology	Reporting of Participants' Characteristics	Reporting of CAM Use	
(Xue, C., C L et al., 2008)	3 (A,B,D)	3 (F,G,H)	2 (I,K)	8
(Côté et al., 2001)	3 (A,B,D)	3 (E,F,H)	2 (I,K)	8
(Chenot et al., 2007)	3 (B,C,D)	3 (E,F,H)	2 (I,K)	8
(Ong, C. K. et al., 2004)	4 (A,B,C,D)	3 (E,F,H)	3 (I,J,K)	10
(Sherman, K. J. et al., 2004)	0	4(E,F,G,H)	2 (I,K)	6
(Broom et al., 2012a)	4 (A,B,C,D)	1 (E)	3 (I,J,K)	8
(Gaul et al., 2011)	2 (C,D)	2 (F,H)	3 (I,J,K)	7
(Chenot et al., 2006)	3 (B,C,D)	3 (E,F,G)	2 (I,J)	8
(Wade et al., 2008)	3 (A,B,D)	3 (F,G,H)	2 (I,K)	8
(Ong, C. et al., 2002)	3 (A,B,D)	2 (F,H)	3 (I,J,K)	8
(Hartvigsen et al., 2002)	3 (B,C,D)	1 (F)	2 (I,K)	6
(Shmueli, A et al., 2011)	4 (A,B,C,D)	3 (F,G,H)	1 (I)	8
(Ailliet et al., 2010)	3 (B,C,D)	2 (F,H)	2 (I)	7
(Fleming et al., 2007)	3 (B,C,D)	3 (F,G,H)	3 (I,J,K)	9
(Broom et al., 2012b)	4 (A,B,C,D)	2 (E,F)	3 (I,J,K)	9

(Millar, 2001)	4 (A,B,C,D)	2 (F,H)	1 (I)	7
(Palinkas & Kabongo, 2000)	4 (A,B,C,D)	3 (F,G,H)	3 (I,J,K)	10
(Kanodia et al., 2010)	3 (A,B,D)	4 (E,F,G,H)	2 (I,K)	9
(Peleg et al., 2011)	2 (C,D)	3 (F,G,H)	1 (I)	6
(Ho et al., 2009)	0	2 (G,H)	3 (I,J,K)	5
(Saper et al., 2004)	3 (A,B,D)	3 (F,G,H)	2 (I,K)	8
(Sibbritt, D et al., 2011)	3 (A,B,D)	2 (F,H)	2 (I,K)	7
(McCaffrey et al., 2004)	3 (A,B,D)	2 (F,H)	2 (I,K)	7
(McGrady & Betz, 2008)	3 (A,B,D)	3 (F,G,H)	2 (I,K)	8
(Wolsko et al., 2003)	3 (A,B,D)	1 (E)	2 (I,K)	6
(Coulter et al., 2002)	4 (A,B,C,D)	2 (F,H)	2 (I,K)	8
(Gkolfinopoulos et al., 2003)	2 (B,C)	2 (E,F)	2 (I,K)	6
(Murthy et al., 2014a)	4 (A,B,C,D)	3 (E,F,H)	2 (I,K)	9
(Murthy et al., 2014b)	4 (A,B,C,D)	3 (E,F,H)	2 (I,K)	9
(Kirby, Broom, Sibbritt, Adams, et al., 2013)	4 (A,B,C,D)	3 (E,F,H)	3 (I,J,K)	10

2.2.3 Results

A total of 30 manuscripts met the review inclusion criteria and reported a wide variety of information on CAM use for back pain (Tables 2.1 and 2.5). In line with the quality appraisal scoring system, studies included in this review were divided into two types: large sample size ($n > 500$) and small sample size ($n < 500$). Large sample-sized studies ranged from 517 to 31,044 participants (mean: 2,696; median: 1,950), and the small sample-sized studies ranged from 92 to 249 participants (mean: 175; median: 194). Only four studies had small sample sizes and were conducted in clinical settings (Gaul et al., 2011; Ho et al., 2009; Peleg et al., 2011; Sherman, K. J. et al., 2004). Of the large sample-sized studies, 8 were conducted in clinical settings (Ailliet et al., 2010; Chenot et al., 2007; Chenot et al., 2006; Coulter et al., 2002; Fleming et al., 2007; Gkolfinopoulos et al., 2003; Hartvigsen et al., 2002; Palinkas & Kabongo, 2000) and the remaining 18 were population-based studies (Broom et al., 2012a, 2012b; Côté et al., 2001; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; McCaffrey et al., 2004; McGrady & Betz, 2008; Millar, 2001; Murthy et al., 2014a; Murthy et al., 2014b; Ong, C. et al., 2002; Ong, C. K. et al., 2004; Saper et al., 2004; Shmueli, A et al., 2011; Sibbritt, D et al., 2011; Wade et al., 2008; Wolsko et al., 2003; Xue, C., C L et al., 2008).

A significant number of studies ($n = 11$) considered for this review were from North America followed by studies from Europe ($n = 9$), Australia ($n = 7$), Western Asia ($n = 2$), and Southeast Asia ($n = 1$). The majority of large sample-sized population studies were from North America ($n = 8$) and Australia ($n = 7$), and Australia had the largest number of large-sized population studies specific to back pain ($n = 6$). Of these Australian back pain-focused studies, five articles reported analyses from a National Longitudinal Study on Women's Health (Broom et al., 2012a, 2012b; Kirby, Broom, Sibbritt, Adams, et al., 2013; Murthy et al., 2014a; Murthy et al., 2014b). The analysis of the articles has been grouped into five themes, and Table 2.5 provides an overview of the important findings.

Table 2.4 Prevalence of CAM use for back pain in various countries, 2000 – 2014

Articles	Country	Acupuncture %	Chiropractic %	Osteopathy %	Massage %	Naturopath %	Homeopathy %	Vitamins/minerals %	Supplements %	Aroma therapy %	Herbal medicines %	Chinese medicine %	Yoga/meditation %	Relaxation %	Prayer %	Cranio-sacral therapy %	Reflexology %	Reikhi %
(Xue, C., C L et al., 2008) ^a	Australia	20.7	65.7	48.4														
(Broom et al., 2012a)	Australia	12	33	8	40	14		77		25	39	7	22					
(Broom et al., 2012b) ^a	Australia	6	16.1	4.1	26.5	10												
(Murthy et al., 2014a) ^{ac} Kirby et al (2012) ^{ab}	Australia	13.3	37.3	8.8	44.1	9.5				1.9 ^e	9.5 ^f	2.8 ^g	9.5			1.5 ^b	3.0 ^b	3.5 ^b
(Murthy et al., 2014b)	Australia							45.2	59.2	8.5	13.1		14.3					
(Ailliet et al., 2010)	Belgium		16.3															
(Côté et al., 2001)	Canada		28.8		7.0													
(Hartvigsen et al., 2002)	Denmark		42															
(Chenot et al., 2006)	Germany	59																
(Chenot et al., 2007)	Germany	13			31		3											
(Gaul et al., 2011)	Germany	51.4		5.6	62.7		11.9	22.7			13.1							
(Ong, C. K. et al., 2004) ^d	UK			11.4														

(Coulter et al., 2002)	USA		41											12				
(Wolsko et al., 2003)	USA		20		14													
(Sherman, K. J. et al., 2004)	USA	11	45		24								7					
(Saper et al., 2004)	USA												42.4					
(McCaffrey et al., 2004)	USA														2.69			
(McGrady & Betz, 2008)	USA	60.2																
(Wade et al., 2008)	USA							73.5			67.5							
(Kanodia et al., 2010)	USA		74		22													

a Naturopaths can also be herbalists in Australia

b & c The study participants in b and c are from the same sample. c also reported self-prescribed CAM treatments for back pain.

d Osteopaths can also be chiropractor in the UK

e Consultation with an aromatherapist

f Consultation with an herbalist

g Consultation with a traditional Chinese medicine practitioner

Table 2.5 Important findings on Complementary and Alternative Medicine (CAM) use for back pain, 2000-2014

	Theme		Important findings	Study characteristics	Key conclusions
1	Prevalence	a. Overall CAM use	6% -76.4% [Mean 34.2%, Median 29%] (Broom et al., 2012a, 2012b; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; Millar, 2001; Murthy et al., 2014a; Murthy et al., 2014b; Ong, C. et al., 2002; Shmueli, A et al., 2011; Wade et al., 2008)	Large* population studies (Broom et al., 2012a, 2012b; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; Millar, 2001; Murthy et al., 2014a; Murthy et al., 2014b; Ong, C. et al., 2002; Shmueli, A et al., 2011; Wade et al., 2008)	Considerable prevalence of CAM use by back pain sufferers. Back pain sufferers tend to use CAM alongside conventional medical care. Combining back pain with other painful conditions in study designs limits extraction of prevalence data. Broad definitions of CAM &/or diversity of CAM modalities contribute to inconclusive data on prevalence.
		b. CAM practitioner use	37% - 76.4% [Mean 55.2%, Median 53.6%] (Broom et al., 2012a, 2012b; Kirby, Broom, Sibbritt, Adams, et al., 2013; Millar, 2001; Murthy et al., 2014a)		
		c. Exclusive CAM use**	1.7% - 20.5% [Mean 8%, Median 2%] (Broom et al., 2012a, 2012b; Wade et al., 2008)		
		d. Self-prescribed CAM use	75.2% (Murthy et al., 2014b)		
2	CAM user profiles	a. Overall CAM use	Common amongst women. (Broom et al., 2012a; Kanodia et al., 2010; Murthy et al., 2014a; Murthy et al., 2014b) Higher amongst white ethnicity. (Kanodia et al., 2010; McGrady & Betz, 2008; Saper et al., 2004; Wade et al., 2008)	Large nationally representative studies (Broom et al., 2012a; Kanodia et al., 2010; McGrady & Betz, 2008; Murthy et al., 2014a; Murthy et al., 2014b; Saper et al., 2004; Wade et al., 2008), large population studies (Côté et al., 2001; Ong, C. K. et al., 2004), large study in a clinical setting. (Chenot et al., 2006)	Sparse data on sociodemographic characteristics of CAM use from population-based back pain studies. Sociodemographic characteristics of CAM use for back pain are varied among studies within and across different countries.
		b. Acupuncture use (Germany)	Higher amongst women, older age, retired. (Chenot et al., 2006)		
		c. Chiropractic use (Canada)	Common amongst men, higher educational levels, higher income, rural residence. (Côté et al., 2001)		
		d. Osteopathic/ chiropractic use (UK)	Higher amongst women, 34-49 year olds, non-manual workers. (Ong, C. K. et al., 2004)		

3	Reasons for CAM use & influential factors	a. Common reasons for CAM use	Frequent, disabling/chronic back pain. (Broom et al., 2012a, 2012b; Côté et al., 2001; Kirby, Broom, Sibbritt, Adams, et al., 2013; Ong, C. K. et al., 2004) Dissatisfaction/waiting for appointments with GPs/lack of benefit from conventional medical treatments. (Broom et al., 2012b; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013)	Large population studies (Broom et al., 2012a; Millar, 2001; Ong, C. K. et al., 2004; Shmueli, A et al., 2011; Wade et al., 2008), large nationally representative studies (Broom et al., 2012b; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013), large studies in clinical settings (Chenot et al., 2007; Chenot et al., 2006; Palinkas & Kabongo, 2000), small studies* in clinical settings. (Chenot et al., 2006; Sherman, K. J. et al., 2004)	Back pain is a key determinant for CAM use. Exclusive CAM use for back pain is rare. Instead back pain sufferers use CAM alongside conventional medical treatments.
		b. Decision-making on CAM use	Willingness to receive CAM treatment if recommended or provided by GPs. (Chenot et al., 2007; Chenot et al., 2006; Millar, 2001; Palinkas & Kabongo, 2000; Sherman, K. J. et al., 2004; Shmueli, A et al., 2011; Wade et al., 2008) Recommendations by family/friends, prior use of CAM. (Chenot et al., 2007; Gaul et al., 2011; Sherman, K. J. et al., 2004)		
4	Self-perceived effectiveness of CAM use	CAM modality	Chiropractic 66%, (Kanodia et al., 2010) and 61% (Wolsko et al., 2003) Massage 65%, (Wolsko et al., 2003) and 56% (Kanodia et al., 2010) Yoga/tai chi/qigong 56% (Kanodia et al., 2010) Acupuncture 42% (Kanodia et al., 2010) Relaxation techniques 43%, (Wolsko et al., 2003)⁷⁰ and 28% (Kanodia et al., 2010) Herbal medicines 32% (Kanodia et al., 2010)	Large nationally representative studies. (Kanodia et al., 2010; Wolsko et al., 2003)	Despite lack of evidence for acupuncture, chiropractic, osteopathy & massage, these were perceived by their users as effective in the treatment of back pain.
5	Communication regarding CAM use & referrals	a. Recommendation by GPs for receiving CAM	24% (Kanodia et al., 2010)	Large nationally representative study, (Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013) small study in a clinical setting. (Gaul et al., 2011)	Majority of studies did not examine communication by back pain sufferers about CAM use with GPs, therefore it is difficult to generalize that CAM use disclosure is common.
		b. Participants spoke to their GPs about CAM use	77.4% (Gaul et al., 2011)		
		c. Participants felt they were always able to talk to their GP about CAM	58.9% (Kirby, Broom, Sibbritt, Adams, et al., 2013)		

		practitioner use.			
		d. Participants felt they were never able to talk to their GP about CAM practitioner use.	7.2% (Kirby, Broom, Sibbritt, Adams, et al., 2013)		

* Large studies with sample size (n>500), small studies with sample size (n<500)

**Use of CAM alone for back pain by participants who did not seek conventional medical care

2.2.3.2 Prevalence of CAM Use

The prevalence rates of overall CAM use for back pain reported in the articles drawing on large sample sizes ranged from 6% to 76.4% (mean: 34.2%; median: 29%) (Broom et al., 2012a, 2012b; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; Millar, 2001; Murthy et al., 2014a; Murthy et al., 2014b; Ong, C. et al., 2002; Shmueli, A et al., 2011; Wade et al., 2008). Among these, five studies drawing on nationally representative samples focused on consultations with one or more CAM practitioner types for back pain reporting prevalence's ranging from 37% to 76.4% (mean: 55.2%; median 53.6%) (Broom et al., 2012a, 2012b; Kirby, Broom, Sibbritt, Adams, et al., 2013; Millar, 2001; Murthy et al., 2014a). One Australian study examining women with back pain reported the prevalence of self-prescribed CAM use as 75.2% (Murthy et al., 2014b). Two other studies from the United States reported findings from research on nationally representative samples and reported on general CAM use for back pain (employing a broad definition of CAM housing both practitioner and self-prescribed CAM use). The prevalence rates of CAM use for back pain in these two studies were 6% and 13.3% (Kanodia et al., 2010; Wade et al., 2008). Three studies using nationally representative samples reported exclusive CAM use (use of CAM alone for back pain by participants who did not seek conventional medical care) as ranging from 1.7% to 20.5% (mean: 8%; median: 2%) (Broom et al., 2012a, 2012b; Wade et al., 2008). Among the other studies with large (but not nationally representative) samples, the prevalence rates of use of CAM for back pain ranged from 11.4% to 69% (mean: 29.4%; median: 28%) (Chenot et al., 2007; Chenot et al., 2006; Coulter et al., 2002; Fleming et al., 2007; Ong, C. et al., 2002; Ong, C. K. et al., 2004; Shmueli, A et al., 2011). Although some other studies with large samples reported on the prevalence of CAM use, they either combined back and neck pain together as a single questionnaire item or considered back pain within the broad category of musculoskeletal pain and as such did not allow extraction of prevalence rates specifically for back pain (Côté et al., 2001; McCaffrey et al., 2004; Palinkas & Kabongo, 2000; Sibbritt, D et al., 2011; Wolsko et al., 2003). Of the four studies drawing on small samples, three studies identified prevalence rates of CAM use for back pain within a range of 5.6% to 62.7% (mean: 38.3%; median: 46.6%) (Gaul et al., 2011; Peleg et al., 2011; Sherman, K. J. et al., 2004). One of the small sample-sized studies, while investigating the use of CAM for chronic pain, reported

the prevalence of back pain in the sample but did not specify the prevalence rate of CAM use specifically for back pain (Ho et al., 2009).

2.2.3.3 Commonly used CAM

In this review, more than half of the articles reported were on the use of specific CAM modalities for back pain (see Table 2.4). Among a range of CAM modalities, acupuncture, chiropractic, osteopathy, and massage therapy were commonly used for back pain. The use of acupuncture for back pain was reported in a number of articles included in the review (in the range of 6%–60.2%, mean: 27.4%; median: 13.3%) (Broom et al., 2012a, 2012b; Chenot et al., 2007; Chenot et al., 2006; Gaul et al., 2011; McGrady & Betz, 2008; Murthy et al., 2014a; Sherman, K. J. et al., 2004; Xue, C., C L et al., 2008). The use of acupuncture for back pain showed wide variation between population-based studies (ranging from 6% to 60.2%, mean: 22.4%; median: 13.3%) (Broom et al., 2012a, 2012b; McGrady & Betz, 2008; Murthy et al., 2014a; Xue, C., C L et al., 2008) and studies conducted within clinical settings (ranging from 11% to 59%, mean: 33.6%; median: 32.2%) (Chenot et al., 2007; Chenot et al., 2006; Gaul et al., 2011; Sherman, K. J. et al., 2004).

Seven population studies drawing on large samples reported prevalence of chiropractic use for back pain from 16.1% to 74% (mean: 39.3%; median: 33%) (Broom et al., 2012a, 2012b; Côté et al., 2001; Kanodia et al., 2010; Murthy et al., 2014a; Wolsko et al., 2003; Xue, C., C L et al., 2008), and four studies in clinical settings reported prevalence of chiropractic use ranging from 16.3% to 45% (mean: 36%; median: 41.5%) (Ailliet et al., 2010; Coulter et al., 2002; Hartvigsen et al., 2002; Sherman, K. J. et al., 2004). The prevalence of osteopathic treatment for back pain ranged from 4.1% to 48.4% (mean: 17.3%; median: 8.4%) as reported by four population studies drawing on fieldwork with large samples (Broom et al., 2012a, 2012b; Murthy et al., 2014a; Xue, C., C L et al., 2008). A German study in a clinical setting reported 5.6% of a sample of 177 back pain patients using osteopathy (Gaul et al., 2011).

Studies with large samples identified massage therapy consultation rates for back pain between 7% and 41.4% (mean: 25.9%; median: 26.5%) (Broom et al., 2012a, 2012b; Chenot et al., 2007; Côté et al., 2001; Kanodia et al., 2010; Murthy et al., 2014a; Wolsko et al., 2003). Apart from one German study (Chenot et al., 2007) of patients consulting general practitioners, all other six studies with large samples were population studies. Meanwhile, within two small sample-sized studies reporting massage therapist consultations for back pain, one from the United States reported a prevalence rate of 24% and another from Germany reported a prevalence rate of 62.7% (Gaul et al., 2011; Sherman, K. J. et al., 2004).

2.2.3.4 CAM user profiles

Among the manuscripts included in the review, 21 articles (Ailliet et al., 2010; Broom et al., 2012a; Chenot et al., 2007; Côté et al., 2001; Coulter et al., 2002; Fleming et al., 2007; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; McCaffrey et al., 2004; McGrady & Betz, 2008; Millar, 2001; Murthy et al., 2014a; Murthy et al., 2014b; Ong, C. et al., 2002; Ong, C. K. et al., 2004; Palinkas & Kabongo, 2000; Saper et al., 2004; Shmueli, A et al., 2011; Sibbritt, D et al., 2011; Wade et al., 2008; Xue, C., C L et al., 2008) reported research from large samples and 4 articles (Gaul et al., 2011; Ho et al., 2009; Peleg et al., 2011; Sherman, K. J. et al., 2004) reporting on research with small samples provided data on socioeconomic status of CAM users. Of the 27 articles outlining the age of CAM users, 24 articles (Ailliet et al., 2010; Broom et al., 2012b; Chenot et al., 2007; Chenot et al., 2006; Côté et al., 2001; Coulter et al., 2002; Fleming et al., 2007; Gkolfinopoulos et al., 2003; Hartvigsen et al., 2002; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; McCaffrey et al., 2004; McGrady & Betz, 2008; Millar, 2001; Murthy et al., 2014a; Murthy et al., 2014b; Ong, C. et al., 2002; Ong, C. K. et al., 2004; Palinkas & Kabongo, 2000; Saper et al., 2004; Shmueli, A et al., 2011; Sibbritt, D et al., 2011; Wade et al., 2008; Xue, C., C L et al., 2008) reported on large samples and 3 articles (Gaul et al., 2011; Peleg et al., 2011; Sherman, K. J. et al., 2004) reported on small samples (under 500). Only 12 articles reported on the ethnicity of CAM users for back pain (Chenot et al., 2006; Fleming et al., 2007; Ho et al., 2009; Kanodia et al., 2010; McGrady & Betz, 2008; Ong, C. K. et al., 2004; Palinkas & Kabongo, 2000; Peleg et al., 2011; Saper et

al., 2004; Shmueli, A et al., 2011; Wade et al., 2008; Xue, C., C L et al., 2008), and of these, 2 articles outlined empirical findings from studies with small samples (Ho et al., 2009; Peleg et al., 2011).

Although several studies report general CAM use, population-based studies analysing sociodemographic characteristics of CAM use for back pain were sparse with only three studies (Broom et al., 2012a; Murthy et al., 2014a; Murthy et al., 2014b) from Australia and a national survey from the United States examining this topic (Kanodia et al., 2010). The Australian studies noted high use of CAM for back pain among mid- to old-aged women as revealed via longitudinal analyses of a cohort of women aged 53 to 61 years (in 2004) and the same cohort of women when aged 56 to 61 years (in 2007) (Broom et al., 2012a). As these studies did not consider other age groups and were restricted to a female-only focus, they have obvious limits with regard to understanding the sociodemographic characteristics of CAM users for back pain across total populations. A further sub-study also from the Australian Longitudinal Study on Women's Health focusing on CAM use for back pain conducted in 2011 using a nationally representative sample of women aged 60 to 65 years revealed no association between income, educational level, marital status or urban/rural residence, and the women's consultation with CAM practitioners or self-prescribed CAM usage for back pain (Murthy et al., 2014a; Murthy et al., 2014b). An US national health survey of the adult population found that CAM use for back pain was associated with young age, non-Hispanic, females, and those who had at least completed high school education (Kanodia et al., 2010).

A number of articles included in this review reported sociodemographic characteristics of users of specific CAM modalities for back pain. A Canadian population-based study examining health-care utilisation by neck or low back pain sufferers found that, in contrast with the association between exclusive conventional medical care use by neck or low back pain sufferers and lower educational levels and lower income, exclusive chiropractic use was associated with higher educational levels and higher income (Côté et al., 2001). Although in this study the analyses conducted included low back pain or neck pain (potentially posing a limitation to its interpretation on chiropractic use for back pain), it was reported in the article that no appreciable differences between the two categories of low back pain and neck pain in terms of their study participants' care seeking behaviour existed (Côté et al., 2001).

This same study also found that chiropractic consultations for neck/low back pain were higher among males and those residing in rural areas compared with those who consulted a conventional medical practitioner for their neck/low back pain (Côté et al., 2001). An UK population survey of osteopathic and chiropractic use for back pain reported higher prevalence for these modalities among 34- to 49-year olds than other age groups, higher prevalence of use by women than men, and higher prevalence of use by non-manual workers than manual workers (Ong, C. K. et al., 2004). A German study on determinants of acupuncture use for low back pain found that acupuncture treatment for back pain was associated with female gender, older age, and being retired (Chenot et al., 2006) but did not show any association with education, income, or marital status for receiving acupuncture among low back pain patients (Chenot et al., 2006). An US study examining the use of acupuncture, chiropractic, massage, meditation, and tai chi did not find any consistent association with sociodemographic characteristics for the choice of CAM treatments for back pain (Sherman, K. J. et al., 2004). Predictors for sociodemographic characteristics of CAM use for back pain are varied among studies within and across different countries. The variation of definition regarding age groups, educational levels, and income categories across the different studies, therefore, restricts the comparisons between the sociodemographic of CAM use for back pain. However, despite these challenges, the literature does appear to show that female gender is an important predictor of CAM use for back pain.

Beyond studies from the United States, data on ethnicity of CAM users for back pain appear severely limited with most non-US studies only reporting on “country of birth” rather than the participants’ ethnic origins and several other studies providing no data on patient ethnicity. Two US studies (Kanodia et al., 2010; Sherman, K. J. et al., 2004) investigating the use of CAM for back pain reported higher use of CAM among people of white race. Four studies (Fleming et al., 2007; Ho et al., 2009; McGrady & Betz, 2008; Peleg et al., 2011) conducted in United States, Israel, and Singapore, which included use of CAM for back pain as one of the survey items among other health conditions, reported high use of CAM among white participants. Some studies in the United States investigating CAM use in general, which also noted high use of CAM for back pain, reported use of CAM more prevalent among people of white race (Palinkas & Kabongo, 2000; Saper et al., 2004; Wade et al., 2008). Despite lack of exhaustive data on ethnicity of CAM users for back pain, literature seems to note greater use of CAM for back pain among white populations.

2.2.3.5 Reasons for CAM use and influential factors

The most common reasons for CAM use for back pain from large sample-sized population studies were “frequent, disabling, or chronic back pain,” suggesting these factors as important predictors of CAM use for back pain (Broom et al., 2012a, 2012b; Kirby, Broom, Sibbritt, Adams, et al., 2013; Ong, C. K. et al., 2004). Small sample-sized studies from Germany, Israel, and Singapore investigating CAM use for pain syndrome also found back pain as an important reason in patients’ decision to choose CAM (Gaul et al., 2011; Ho et al., 2009; Peleg et al., 2011). An US study of patients using opioid therapy for chronic pain identified “severity of back pain” as a significant reason for CAM use (Fleming et al., 2007). Dissatisfaction with general practitioners’ (GPs) availability, length of waiting for appointments with GPs, or lack of benefit from conventional medical treatments for back pain were noted as reasons for CAM use by studies focusing specifically on CAM use by back pain sufferers (Broom et al., 2012b; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013). In general, most back pain-specific studies using large samples did not find gender, age, or functional capacity as determinants of CAM use for back pain (Chenot et al., 2007; Chenot et al., 2006; Côté et al., 2001; Kanodia et al., 2010; Ong, C. K. et al., 2004).

In two Australian studies, one investigating CAM consultations (Murthy et al., 2014a) and the other investigating self-prescribed CAM treatments (Murthy et al., 2014b) for back pain, the frequency of CAM use was greater with increased visits to GPs confirming CAM as an additional treatment option to conventional medical care. The pattern of CAM use for back pain supplementary to conventional care was evident across back pain-specific population studies from North America, Europe, and Australia, thereby suggesting that back pain sufferers did not choose CAM instead of conventional medicine (Broom et al., 2012a, 2012b; Côté et al., 2001; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; Murthy et al., 2014a; Murthy et al., 2014b; Ong, C. K. et al., 2004). Two studies from Germany reported that patients were willing to receive CAM treatments if provided or recommended by a conventional medical practitioner (Chenot et al., 2007; Chenot et al., 2006). In a small sample-sized US study examining back pain sufferers’ willingness to try CAM treatments, patients were willing to try CAM therapies supplementary to conventional medicine if CAM treatment was provided by a GP or if CAM treatments were

subsidised (Sherman, K. J. et al., 2004). Back pain sufferers' decision making on CAM use influenced by recommendation and/or provision of CAM treatment for back pain by GPs was a finding reported by four other studies that examined CAM use for back pain among a range of other health problems (Millar, 2001; Palinkas & Kabongo, 2000; Shmueli, A et al., 2011; Wade et al., 2008). Three studies that specifically focused on CAM use for back pain reported recommendations by family/friends/ acquaintances and previous use of CAM as influencing back pain patients' decision making on CAM use (Chenot et al., 2007; Gaul et al., 2011; Sherman, K. J. et al., 2004). Two studies that investigated chiropractic use among large samples of patients in clinical settings reported the rates of referral by family or friends as 23% (Hartvigsen et al., 2002) and 65.8% (Ailliet et al., 2010), and a study on the use of acupuncture, chiropractic, or osteopathy among 1,067 adults in Australia also noted family/friends as the most common form of referral to these therapies (Xue, C., C L et al., 2008). Only one study reported the media as influencing CAM use (among one-third of a sample of US women) (Wade et al., 2008).

2.2.3.6 Self-perceived effectiveness of CAM use for back pain

Nearly half the reviewed articles reported on self-perceived effectiveness of CAM use and showed that back pain sufferers who use CAM perceive their CAM treatments to be beneficial. In general, users of chiropractic, acupuncture, osteopathy, naturopathy, massage, yoga, herbal medicine, and/or prayer perceived the use of these CAM as beneficial (Ailliet et al., 2010; Chenot et al., 2006; Coulter et al., 2002; Fleming et al., 2007; McCaffrey et al., 2004; Palinkas & Kabongo, 2000; Peleg et al., 2011; Saper et al., 2004; Shmueli, A et al., 2011; Xue, C., C L et al., 2008). However, the majority of articles reviewed considered CAM use for various health conditions including, but extending beyond, back pain, and only five studies considered participants' perceptions of CAM effectiveness specifically and exclusively for back pain. Of these five back pain-focused studies, two US population studies reported satisfaction with chiropractic (66% and 61%), massage (56% and 65%), and relaxation techniques (28% and 43%), respectively, for back pain (Kanodia et al., 2010; Wolsko et al., 2003), and yoga/tai chi/qui gong (56%), acupuncture (42%), and herbal medicines (32%) were also rated effective for treating back pain in one study (Kanodia et al.,

2010). In an US study examining the willingness of adults with back pain to try a range of CAM, massage was perceived by the participants as more helpful than other options, whereas the least beneficial treatment for back pain was perceived as being meditation among this study sample (Sherman, K. J. et al., 2004). However, respondents in this study who were 65 years and older were less optimistic about the potential benefit of acupuncture and massage for treating back pain (Sherman, K. J. et al., 2004). Meanwhile, an Australian study on the use of CAM for back pain among women aged between 60 and 65 years found women who consulted with an acupuncturist, herbalist, naturopath, or massage therapist rated these treatment options as more beneficial than other CAM treatments for treating their back pain (Kirby, Broom, Sibbritt, Adams, et al., 2013).

2.2.3.7 Communication regarding CAM use and referrals

Three articles from those reviewed reported on referral to CAM practitioners specifically for back pain or communication about CAM use by back pain sufferers with care providers (Gaul et al., 2011; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013). An US study identified that 24% of those who used CAM for back pain did so following a recommendation from their conventional medical practitioner (Kanodia et al., 2010), and an Australian survey of female back pain sufferers found that 58.9% of respondents felt they were always able to talk to their GP about CAM practitioner use, whereas 7.2% felt they were never able to talk to their GP about CAM practitioner use for back pain (Kirby, Broom, Sibbritt, Adams, et al., 2013). Meanwhile, the same Australian study also revealed that 62.5% of the women sampled always felt they could talk to their CAM practitioner about consulting a GP for their back pain and 8.9% felt this was never possible (Kirby, Broom, Sibbritt, Adams, et al., 2013). A German study conducted at a primary health-care clinic comparing CAM use for back pain and headache reported that 77.4% of the study participants had spoken to their GPs about CAM use (Gaul et al., 2011).

2.2.4 Discussion

This article reports the first integrative review of international literature on CAM use for back pain providing insights of benefit to conventional health and CAM practitioners in their attempts to provide coordinated back pain care. The findings published by empirical research since 2000 suggest CAM use for back pain as an important contemporary health service issue.

Although our review suggests that there is substantial evidence for CAM use in back pain across countries, the capacity of this review to compare findings from various studies and/or generalise evidence of CAM use for back pain is difficult because of the variation in research designs (e.g. population based vs. clinical settings). Furthermore, as our research draws its findings from studies conducted in different countries, it is to be expected that the vast differences in legal and regulatory frameworks of CAM practices prevent ubiquitous definition of care even for the same CAM modality. For example, in Australia, osteopaths are nationally registered primary contact health providers, who do not prescribe pharmaceuticals, whereas in the United States, osteopathic physicians possess full medical rights. In addition, our study does not examine efficacy of CAM treatments for back pain thus limiting comparisons between CAM treatments for back pain. The broad definition of CAM and the diversity in the range of CAM modalities between studies investigated pose particular challenge in interpreting the findings. These issues of definitions of CAM and the diversity of CAM modalities are frequently reported challenges in research examining CAM use (Adams et al., 2012). The omission of research articles published in languages other than English in this review may also constitute a source of possible bias. Despite these limitations, the evidence analysed in this review, nevertheless, provides important insights into extent and diversity of CAM use by back pain sufferers.

2.2.4.1 Prevalence and popularity of CAM use for back pain

Our review reveals a considerable use of CAM by back pain sufferers (see Table 2.5) with an overall use of CAM ranging from 6% to 76.4% (Broom et al., 2012a, 2012b; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; Millar, 2001; Murthy

et al., 2014a; Murthy et al., 2014b; Ong, C. et al., 2002; Shmueli, A et al., 2011; Wade et al., 2008) and a diverse range of prevalence of CAM practitioner consultations and use of self-prescribed CAM (see Table 2.4). Our review suggests that back pain sufferers use CAM alongside conventional medical treatments, a finding consistent with research on CAM use among patients suffering from chronic conditions (Adams et al., 2012). In contrast with the supportive role (i.e. maintenance of general well-being) that CAM seems to play for patients with cancer, diabetes, and other chronic illnesses (Bishop, Felicity L & Lewith, 2010), CAM use in back pain seems to take a more central role as demonstrated by our review, with back pain as an important determinant for CAM use. Yet, our review showed little evidence for the exclusive use of CAM by back pain sufferers with a prevalence ranging from 1.7% to 20.5% as reported by three studies (Broom et al., 2012a, 2012b; Wade et al., 2008). In light of concurrent use of conventional medical care and CAM by back pain sufferers, there is a need for back pain care providers to enquire their patients regarding the manner and order in which they use CAM and conventional medicine and what factors determine how their patients navigate their conventional medical care and CAM use.

Although acknowledging that there is a wide range of CAM usage reported in the reviewed studies (see Table 2.4), CAM consultations by back pain sufferers were particularly common for chiropractic (mean: 38.11%; median: 37.3%), massage (mean: 30.14%; median: 26.5%), acupuncture (mean: 27.4%; median: 13.3%), and osteopathy (mean: 14.38%; median: 8.4%). Whether back pain sufferers choose chiropractic, massage, acupuncture, or osteopathy as primary treatment or concurrent to conventional medical treatment or in fact because of dissatisfaction with conventional medical care is difficult to ascertain from our review. However, it is interesting to note that these CAM modalities were perceived by their users as effective in the treatment of back pain. However, we do need to remain mindful that such effectiveness is based on self-report only. Meanwhile, systematic reviews on back pain have shown that acupuncture has potential benefit as an adjunct to conventional medical care (Hutchinson et al., 2012; Yuan et al., 2008), whereas systematic reviews on chiropractic (Lawrence et al., 2008) and massage (Furlan et al., 2009) have shown that these modalities are effective when combined with exercise, and a systematic review on osteopathy (Licciardone, J. et al., 2005) has reported its long-lasting effects in improving nonspecific low back pain, all of which highlight the benefit of these respective CAM treatments as adjuncts to conventional

medicine and/or self-care. Considering that back pain sufferers use both CAM and conventional medicine and that our review also revealed back pain sufferers' increased willingness to receive CAM when provided by GPs, the vast differences in legal and regulatory standards for CAM provision across countries pose challenges as an important health service issue. Furthermore, it is unclear if the integration of certain CAM treatments and conventional medical treatments is predominantly patient driven or directed by clinical guidelines for back pain care incorporating evidence on CAM. The issue of integrating evidence-based CAM and conventional medicine in back pain care needs detailed research examination as it has implications for respective CAM providers, conventional medical care providers, and policy makers in the provision of effective back pain care.

2.2.4.2 Profile of CAM users and influential factors on decision-making for CAM use

The sociodemographic determinants for CAM use by back pain sufferers as revealed by our review displayed a number of findings (see Table 2.5). Female gender was a frequently reported determinant for CAM use across the studies reviewed, although it is to be noted that 6 (of 30) articles had female-only samples. The finding that female gender is an important determinant for CAM use is not surprising, as women in general are known to be higher users of health care (Ong, C. K. et al., 2004; Wade et al., 2008; Xue, C., C L et al., 2008) than men and also use CAM more frequently than men (Ong, C. K. et al., 2004; Wade et al., 2008; Xue, C., C L et al., 2008). Chronicity of back pain is known to promote active information seeking by back pain sufferers in exploring CAM treatments (Bishop, Felicity L, Yardley & Lewith, 2007), and family/ friends have been reported by studies on CAM use (Wade et al., 2008; Xue, C., C L et al., 2008) as one of the key influential information sources for CAM use. Back pain care providers, therefore, must take particular interest in how female patients with back pain use practitioner-based and/or self-prescribed CAM treatments.

2.2.4.3 The issue of communication about CAM use

Three (of 30) studies in our review indicate the readiness of a majority of back pain sufferers to disclose CAM use to their GPs (see Table 2.5). However, the vast majority of studies have not sufficiently examined this issue among back pain patients, and it is difficult to generalise that the disclosure of CAM use is common for back pain sufferers. The issue of disclosure is particularly important considering a substantial prevalence of use of vitamins/minerals (mean value: 54.6%; median: 59.35%) and herbal medicines (mean value: 28.44%; median: 13.1%) as reported by studies reviewed, yet, the sparse evidence on prevalence of self-prescribed CAM treatments for back pain (with only one study reporting self-prescribed CAM treatments). In the context of the wide availability of over-the-counter back pain care products (i.e. herbal medicines and vitamins/minerals), it can be expected that nondisclosure of self-prescribed CAM can be a highly important issue of which back pain care providers need to be aware. Relevant health-care professionals should be ready to initiate discussion about use of CAM and identify potential sources of adverse effects especially if their patients are taking substance-based CAM treatments. This is particularly important for those taking herbal medicines for their back pain, as some herbs may lead to adverse effects when combined with use of analgesics (Abebe, 2002).

Despite relatively high-quality scoring for methodological rigor across the reviewed articles (Table 2.3), with a majority of studies using representative and large samples, there remains a pressing need for detailed examination of CAM use in back pain through longitudinal studies employing mixed methods. Indeed, our review showed chronicity of back pain as an important determinant for using CAM and longitudinal studies focusing on patterns of CAM use, integration of CAM with conventional medical treatments by back pain sufferers, factors influencing decision making on types of CAM treatments, effectiveness of CAM treatments, and dynamics of patient and practitioner communication over a period of time will help understand address some key future research questions regarding CAM use and CAM users in back pain.

2.2.5 Conclusion

Contemporary research suggests that CAM use for back pain is common across many countries. This review provides insights into key issues relating to the use of CAM by back pain sufferers and as such highlights the need for back pain care providers and health policy makers to be aware of the prevalence of CAM use, commonly used CAM, factors influencing decision making on CAM use, and other important issues that have implications for care provision for back pain sufferers. Further research using mixed methods is recommended to examine issues still unclear and important for safe and effective treatment in the coordinated care of those suffering from back pain.

2.3 Chapter summary

The literature review reveals a substantial variation in prevalence of CAM use for back pain internationally. Although there seems to be certain CAM modalities, that are popular (e.g. acupuncture, massage therapy) for back pain treatment, there is little published information, hence knowledge, on self-prescribed CAM treatments. Further, most studies do not differentiate between practitioner administered and self-prescribed CAM treatments for back pain. Also, existing literature is largely based on research investigating CAM use for back pain amongst a range of other conditions, therefore necessitating further research focusing exclusively on back pain. Despite CAM users reporting CAM as beneficial for back pain, there is little knowledge on CAM users' communication with health care providers on their CAM use for back pain. There exists a gap in literature on the differences between determinants of self-prescribed CAM and CAM practitioner consultations. Therefore, additional research in these areas is needed for a clearer understanding of the determinants of CAM use in back pain.

3 Research design and methodology

3.1 Chapter introduction

The purpose of this chapter is to provide a broad overview of the design and methodology employed in this study. As the data analysed and reported in this thesis was obtained from a sample of women recruited from the Australian Longitudinal Study on Women's Health (ALSWH), this chapter begins by outlining the background, study design, participants, data collection, data management, and ethical considerations of the ALSWH, followed by an overview of the sub-study. Note that detailed methodology for each research paper included within this thesis is described in the respective chapters of this thesis (Chapters 4-8).

3.1.1 Survey method

The data analysed and presented in this thesis was collected via a cross-sectional survey, specifically using a questionnaire. Survey research is a widely used observational method and falls within the category of descriptive study designs (Jolley, 2004). The purpose of descriptive studies is to describe the phenomenon of interest as well as describing observed associations in order to estimate certain population parameters (Bowling, 2002). Further, descriptive studies can be employed to generate hypothesis about the cause and effect associations between variables of interest (Bowling, 2002). Survey research uses a *questionnaire* as a tool to gather information as accurately as possible to measure knowledge, attitudes and behaviours of a sample of the population of interest (Bowling, 2002). Unlike a census, which is a partial enumeration of information from a sample, surveys aim to provide complete enumeration and gathering of information from the target population (Bowling, 2002). In surveys, the units of analysis are usually individuals from a *sample* who share common characteristics, for instance, a birth cohort consisting of individuals born during a certain period of time (Bowling, 2002). For describing the characteristics and experiences of the target population via data collected in a survey, quantitative methods are often employed as they allow for analysing the data through descriptive and inferential statistics (Groves et al., 2011).

Surveys are referred to as cross-sectional if they are carried out at one point in time and as longitudinal if carried out at more than one point in time (Bowling, 2002). Cross-sectional survey draws upon events, behaviours, attitudes and experiences of a representative sample of a defined population at a given point in time to determine, for example, the prevalence, health service utilisation and characteristics of users of various health services (Bowling, 2002; Jolley, 2004). Data collected through cross-sectional surveys can be valuable in estimating the health care needs of the population (Bonita, Beaglehole & Kjellstrom, 2006). However, cross-sectional surveys are limited in their capacity to capture rarely occurring health issues and health service issues as these would be only reported by a small number of individuals at any one point in time (Jolley, 2004). Whilst this section has acknowledged certain limitations to cross-sectional survey design, a more detailed discussion of the limitations of survey methodology with regards to this thesis is presented in Section 8.7. As this thesis examines the prevalence and patterns of women's use of CAM for their back pain during a twelve-month period from a cohort of women born during a specific period (1945-1951), a cross-sectional survey design is appropriate.

3.1.1.1 Questionnaire design

Amongst several ways of conducting cross-sectional surveys, self-administered questionnaires sent out by post to study participants are an efficient method of gathering data from a large sample covering a wide geographically spread population (Bowling, 2002). When a questionnaire utilises a structured format with fixed, standardised questions, batteries of questions and/or scales posed to all participants in the same way with pre-coded response options, allows for unambiguous answers that are easy to analyse quantitatively (Bowling, 2002). Further, questionnaires reduce the chances of interview bias and social desirability bias (Bowling, 2002). However, self-administered questionnaires have certain limitations. These include recall bias, requirement for all respondents to be literate and share a common language, assumption that the researcher and the participants share the same frame of reference about issues and meanings of wordings in the questionnaire (Bowling, 2002).

Overall, given the ability of cross-sectional survey questionnaire method to investigate prevalence patterns for common health seeking behaviours relating to the research aims and objectives for this thesis, survey research is an appropriate approach. Cross-sectional survey design in this research is optimal as it provides the ability to measure events (e.g. consultations with CAM practitioners and/or self-prescribing CAM treatments for back pain), behaviours (e.g. patterns of health service utilisation and CAM use) and attitudes (e.g. factors influencing women's decision-making with regard to CAM use).

3.2 Background: Australian Longitudinal Study on Women's Health (ALSWH)

The Australian Longitudinal Study on Women's Health (ALSWH) was established in 1995 and examines factors influencing health and wellbeing of women throughout women's life span from a broadly representative sample of the entire Australian population (Brown, W. J. et al., 1999). Taking a comprehensive approach to health, the ALSWH adopts a social rather than a narrowly focused medical approach to women's health by assessing physical and emotional health, use of health services, health behaviour and risk factors, time use (e.g. paid and unpaid work, leisure), socio-demographic factors and life stages and key events (e.g. child birth, death) (Brown, W. J. et al., 1999). By providing an evidence base to decision-making bodies and the government of Australia, the ALSWH takes a critical role in development and evaluation of policy and practice shaping the nature of women's health care.

The emergence of a national longitudinal study on women's health dates back to the women's movement of the 1980s in Australia, which led to activists pressuring governments to develop women's health policies. Following national consultation with women's organisations, a national women's health policy was launched in 1989 (Lee, C. et al., 2005), which led to designing a national longitudinal study on women's health. A contract was drawn between the Australian government and the University of Newcastle in 1995 to conduct longitudinal surveys for at least 20 years, with the first survey taking place in the year 1996. Despite political and social changes, the

Australian government has continued to fund the ALSWH to date by renewing the contract every three years following a review process (Lee, C. et al., 2005).

3.3 ALSWH study methodology

The study participants of the ALSWH consists of women in three age cohorts: a 'younger' cohort (born 1973–1978) aged 18–23 in 1996; a 'mid-age' cohort (born 1946–1951) aged 45–50 in 1996; and an 'older' cohort (born 1921–1926) aged 70–75 in 1996. These women were randomly selected from the database of The National Health Insurance Commission (HIC), which manages the national health insurance scheme, Medicare (Lee, C. et al., 2005). The Medicare database is trusted to contain the most comprehensive and up-to-date record of names and addresses for all Australian permanent residents and citizens.

The rationale for the age groups of the three cohorts was to select women collectively representing the key life stages from the age of 18 to 95 years, enabling the participants to start their participation in the study before the occurrence of major life events such as, first pregnancy, menopause and retirement. The selection of participants in the three cohorts was random, however women living in rural and remote areas were sampled at double the rate of women living in urban areas to gather data on the heterogeneity of health experiences of women living outside metropolitan areas. The participants in the baseline survey during 1996 were shown to be broadly representative of the three age groups of women from the entire Australian population.

Questionnaires, along with information packs, were sent to 106,000 women by the Health Insurance Commission on behalf of the ALSWH. After taking into consideration those envelopes that were returned to the sender unfilled due to death, change of address, travelling overseas, too ill to participate or male gender, the response rate for the 1996 survey was estimated at 41–42% for the younger cohort (n=14,247), 53–56% for the mid-age cohort (n=13,716) and 37–40% for the older cohort (n=12,432). Further 1,414 completed questionnaires by women from the younger cohort (n=523), mid-age cohort (n=383) and the older cohort (n=508) could

not be utilised as either these women had not signed the consent form or did not provide their contact information (Lee, C. et al., 2005). Table 3 provides an overview of the six main ALSWH surveys since 1996.

Table 3.1 Scope of ALSWH main surveys since 1996

Survey number	Year	Young cohort		Mid-age cohort		Elderly cohort	
		Age	Number of Participants	Age	Number of Participants	Age	Number of Participants
Survey 1	1996	18-23	14,247	45-50	13,716	70-75	12,432
Survey 2	1998			47-52	12,338	73-78	10,434
	2000	22-27	9,688				
Survey 3	2001			50-55	11,226		
	2002					76-81	8,647
	2003	25-30	9,081				
Survey 4	2004			53-58	10,905		
	2005					79-84	7,158
	2006	28-33	9,145				
Survey 5	2007			56-61	10,638		
	2008					82-87	5,561
	2009	31-36	8,200				
Survey 6	2010			59-64	10,011		
	2011					85-90	4,055
	2012	34-49	8,010				

3.4 The Sub-study Participants

The sub-study participants were recruited from the 1946-51 cohort of the ALSWH, who were aged 60-65 years at the time of the sub-study survey conducted during 2011/2012. Of the 10,011 women who participated at the sixth ALSWH survey (during 2010), 1,851 women indicated that they had experienced back pain. In 2011, sub-study questionnaires were mailed to these 1,851 women. Of these women, there were 5 who had subsequently dropped out of the ALSWH, 2 were deceased, 34 women elected not to participate in this sub-study, one was overseas and 92 women were ineligible as they did not suffer from back pain at the time of the sub-study survey. A total of 1,310 women completed the survey representing a response rate of 80.9%.

3.5 Survey questionnaire

The sub-study questionnaire (see Appendix 2) was developed through the collaboration of a multi-disciplinary team including experts in conventional medicine, complementary and alternative medicine, biostatistics, epidemiology, and social sciences. The sub-study questionnaire was pilot tested on 20 lay people. Some questionnaire items were based on survey questions used previously in other ALSWH studies (Women's Health Australia, 2011). In addition, the questionnaire contained a range of items that are part of well-validated tools such as the SF-36 quality of life measure. A number of new questions were developed specifically for the sub-study, through the collaboration of a multi-disciplinary team including experts in conventional medicine, complementary and alternative medicine, biostatistics, epidemiology, and social sciences. The entire questionnaire was pilot tested on 30 lay people (i.e. ALSWH participants) and revised accordingly. The questionnaire contained a range of question items relating to back pain, consultations with complementary and alternative health care practitioners for back pain, health service utilisation including consultations with conventional medical practitioners and allied health care professionals for back pain, use of self-prescribed CAM treatments for back pain, key sources of information in decision making on choices of CAM for back pain, women's attitudes toward CAM and communication about use of alternative medicine with health care providers. The questionnaire contained dichotomous (yes/no), multiple

category, and open-ended questions. The self-administered questionnaire was mailed out to the participants.

3.5.1 Back pain related questions/concerns

Women were asked about their back pain related health concerns (see Appendix 2, Question 1- 5). Specifically, women were asked how long they have had back pain, and frequency of back pain (never, rarely, intermittently, regularly or continuously). Women were also asked about the intensity of pain at its worst, at its best and at an acceptable level in the previous 12 months. A 10 point Likert scale, where 1 = 'no pain' and 10 = 'worst possible pain' was used to indicate the intensity of back pain. Women were asked about symptoms or conditions relating to their back pain (see Appendix 2, Question 39) and information was collected on a range of symptoms/conditions associated with back pain including headaches/migraines, nausea, neck pain, leg pain/sciatica, arm pain, pins and needles/numbness, stiffness, fatigue, weakness, depression, sleeping problems, instability, muscle spasm and anxiety/tension. Women were also asked to indicate who they sought help from for each back pain related symptom or condition. Choices included GP or specialist, chiropractor, acupuncturist, herbalist/naturopath, physiotherapist, massage therapist and osteopath.

3.5.2 Socio-demographic measures

The marital status, urban/rural residence, highest educational qualification the participants had completed and their spending ability with regard to CAM therapies as reported in the baseline survey during 2010 (see Appendix 1) was utilised to extrapolate the demographic characteristics in this sub-study.

Postcode of residence at the time of sixth ALSWH survey (2010) was utilised to classify a woman's area of residence as urban or non-urban according to the Australian Standard Geographical Classification (ASGC) (Australian Institute of Health and Welfare, 2016). Based on the distance by road to the nearest service

centre, ASGC classifies areas of residence as 'major cities', 'inner regional', 'outer regional', 'remote' and 'very remote'. The ASGC categories of remote and very remote were combined for the ALSWH surveys, as the number of participants in these two areas was low. Therefore, the ALSWH classify the areas of residence as 'major cities', 'inner regional', 'outer regional' and 'remote/very remote'. For the purpose of this thesis, 'urban' represents combination of 'major cities', 'inner regional' and 'outer regional' and 'rural' represents 'remote/very remote'.

Women were asked about their marital status (see Appendix 1) (Question 110 – married (registered), de facto relationship (opposite sex), de facto relationship (same sex), separated, divorced, widowed, never married). Women were also asked about their highest educational qualifications completed (see Appendix 1) (Question 108 – no formal qualifications, school or intermediate certificate or equivalent, high school or leaving certificate or equivalent, trade/ apprenticeship, diploma, university degree, higher university degree). Women were asked about their ability to manage on their available income (see Appendix 1) (Question 99 – it is impossible, it is difficult all the time, it is difficult some of the time, it is not too bad and it is easy to manage on available income). Women were also asked if they had or did not have private health insurance (see Appendix 2, Question 38). If the women reported private health insurance cover, they were further asked if such insurance covered consultations with massage therapists, chiropractors and/or acupuncturists (see Appendix 2, Question 38).

3.5.3 Conventional health care utilisation

Women were asked to indicate the frequency with which they consulted conventional medical practitioner(s) for their back pain in the previous twelve months (see Appendix 2, Question 11). The practitioner categories included general practitioner, orthopaedic specialist, neurologist, rheumatologist and any other. Likert scale was used for indicating frequency of visits as: none, 1 or 2 times, 3 or 4 times, 5 or 6 times and 7 or more times.

3.5.4 Allied health care utilisation

Women were also asked to indicate the frequency with which they consulted allied health practitioner(s) for back pain in the previous twelve months (see Appendix 2, Question 9). The practitioner categories included physiotherapist, occupational therapist, nurse, pharmacist and any other. Likert scale was used for indicating frequency of visits as: none, 1 or 2 times, 3 or 4 times, 5 or 6 times and 7 or more times.

3.5.5 CAM practitioner utilisation

Women were asked to indicate the frequency with which they consulted complementary and alternative health care practitioner(s) for back pain in the previous 12 months (see Appendix 2, Question 7). The response categories included: none, 1 or 2 times, 3 or 4 times, 5 or 6 times and 7 or more times for the following practitioners: acupuncturist, aroma therapist, craniosacral therapist, chiropractor, herbalist/naturopath, massage therapist, meditation/yoga practitioner, osteopath, reflexologist, reiki therapist, traditional Chinese medicine practitioner and an option to specify 'other'.

3.5.6 Self-prescribed CAM use for back pain

Women were asked to indicate the frequency with which they used self-prescribed CAM treatment(s) for their back pain in the previous twelve months (see Appendix 2, Question 13). Likert scale was used for indicating frequency of visits as: none, 1 or 2 times, 3 or 4 times, 5 or 6 times and 7 or more times. The list of self-prescribed CAM treatments included were, herbal medicines, vitamins/minerals (e.g. magnesium), supplements (e.g. glucosamine, fish oils), meditation or yoga, aromatherapy oils, Chinese medicine, self-prayer and an option to specify 'other alternative therapies'.

3.5.7 CAM related information seeking behaviour

Women were asked about information sources that were influential in their decision-making on the use of CAM for their back pain (see Appendix 2, Question 28). The sources of information included, family or relatives, partner, friends or colleagues, the Internet, book or magazine, mass media (e.g. newspaper, TV, radio), doctor, pharmacist, allied health worker (e.g. nurse) and CAM practitioner.

3.5.8 Attitudes and beliefs about CAM

Women were asked about their attitudes toward CAM practitioner use and self-prescribed CAM use for their back pain (see Appendix 2, Question 35). The women were asked to indicate their level of agreement or disagreement (i.e., strongly agree, agree, neutral, disagree, strongly disagree) with the following statements: CAM is more natural than conventional medicine; CAM has fewer side effects than conventional medicine; CAM promotes a holistic approach to health; CAM gives more control over health/body; knowledge about evidence of CAM is important to me as a patient; clinical evidence is important in my choice of CAM; my personal experience of the effectiveness of CAM is more important than clinical evidence; CAM needs to be tested for safety/side effects. In addition to these statements, back pain sufferers who had consulted CAM practitioners were asked to indicate their level of agreement or disagreement (i.e. strongly agree, agree, neutral, disagree, strongly disagree) with the following statements: CAM practitioners spend a longer time with me in consultations when compared with my doctor; CAM practitioners provide more support to me than my doctor does; I find it easier to talk to a CAM practitioner than to a doctor; I have more equal relationship with a CAM practitioner than with doctors; doctors should be able to advise their patients about commonly used CAM for back pain.

3.5.9 Communication regarding CAM use

Women were asked various questions regarding their communication with back pain care providers about CAM use (see Appendix 2, Questions 21, 22, 24, 25, 29, 30, 32, 33, 34). Specifically, women were asked if they had consulted their GP or a pharmacist before using CAM for their back pain and whether they had informed their GP or pharmacist after using CAM for their back pain. Women were asked when they used CAM and had consulted a GP, if they felt able to talk to their GP about their CAM use. Women were asked if they had consulted a CAM practitioner and a GP, whether they felt able to talk to their CAM practitioner about their GP consultation for their back pain. Women were also asked if they had consulted more than one CAM practitioner, whether they felt able to talk to one CAM practitioner about their consultation with another CAM practitioner for their back pain. Women were asked if they had self-prescribed CAM treatment for their back pain and had consulted a GP, whether they felt able to talk to their GP about their self-prescribed CAM. Women were asked if they had self-prescribed CAM treatment for their back pain and had consulted a CAM practitioner, whether they felt able to talk to their CAM practitioner about self-prescribed CAM for their back pain. The options provided for each of the above questions were: 'always', 'sometimes', 'rarely' or 'never'.

3.6 Data collection and data management

Participants returned the completed survey via pre-paid postal envelope to the ALSWH. An Optical Mark Recognition software was used to capture the survey data saved as scanned images. In order to ensure accuracy of data recognition from the scanned images, data capture was performed twice using slightly different levels of mark recognition sensitivity. The ALSWH staff then reconciled any discrepancies between the two data captures. Any internal inconsistencies in survey data were also further checked and reconciled by the ALSWH staff. Further, a review of outliers was performed in order to identify any potential errors in the survey data. The data was safely stored on a password-protected laptop.

3.7 Data analysis

For all analysis, statistical significance was set at $p < 0.05$. All analyses were conducted using statistical software STATA 11.2 (STATA Corp LP).

3.7.1 Descriptive statistics

The prevalence of women's consultations with CAM practitioners for back pain and self-prescribed CAM treatments for back pain was estimated, with 95% confidence interval. Women's health service utilisation and CAM use for back pain and socio-demographic characteristic of CAM users were estimated, with 95% confidence interval. Women's consultations with CAM practitioners and influential information sources for CAM practitioner use with regard to symptoms/conditions associated with back pain were also estimated, with 95% confidence interval. Also, attitudes of women towards CAM and the use of CAM practitioner and/or self-prescribed CAM treatments for back pain were estimated, with 95% confidence interval.

3.7.2 Bivariate comparisons

Student's *t*-test, Wilcoxon rank-sum test, Chi-square analysis were utilised for calculating the associations between two categorical variables. Bonferroni correction was used to adjust for multiple comparisons where appropriate.

3.7.3 Multivariate logistic regression models

A logistic regression model was used in determining significant covariates from multiple variables, if they contained a (bivariate) *p*-value of < 0.25 (Hosmer Jr & Lemeshow, 2004). Then a stepwise backward elimination process was employed, using a likelihood ratio test to eventually arrive at the most parsimonious model (Hosmer Jr & Lemeshow, 2004).

3.7.4 Comparison of demographic and health status measures of non-responders with those of responders

In comparing the responders against the non-responders (Table 3.2) it can be seen that there are no statistically significant differences between the groups in terms of demographic characteristics. Similarly, there are no statistically significant differences between the groups for most of the SF-36 dimensions. However, there were

statistically significant differences between the groups for general health (0.030), role emotional (0.002) and mental health (0.026); where the non-responders had poorer health on these three measures. These comparisons show that overall the responders and non-responders appear to be similar, although the non-responders may have worse mental health. As such, these differences should be taken into consideration when interpreting the findings of this study.

Table 3.2 A comparison of responders and non-responders across demographic and health status measures

Demographic and Health Status Characteristics		Sampling Frame		p-value
		Non-Responders	Responders	
		(n=310)	(n=1,310)	
Area of Residence	Urban	40	40	0.555
	Rural	55	56	
	Remote	5	4	
Education	No formal	18	17	0.953
	High School	47	47	
	Trade/Diploma	20	20	
	Tertiary	15	16	
Marital Status	Married/Defacto	74	73	0.729
	Sep./Div./Wid.	24	24	
	Single	2	3	
SF-36	Physical Functioning	Mean (SD) 69.0 (25.6)	Mean (SD) 70.1 (23.8)	0.373
	Role Physical	56.4 (44.3)	59.9 (42.3)	0.108
	Bodily Pain	53.2 (24.9)	52.4 (23.4)	0.507
	General Health	60.8 (24.2)	63.4 (22.4)	0.030
	Vitality	52.5 (22.2)	54.0 (21.9)	0.194
	Social Functioning	73.9 (28.1)	76.3 (27.1)	0.057
	Role Emotional	73.2 (40.6)	79.2 (36.0)	0.002
	Mental Health	71.3 (19.8)	73.4 (19.1)	0.026

3.8 Ethical considerations

Ethical approval for the sub-study reported here was gained from the Human Ethics Committees at the University of Newcastle, University of Queensland and University of Technology Sydney, Australia. For this doctoral project, ethical clearance was

obtained from the University of Technology Sydney (UTS) (see Appendix 3). A Nil/negligible Risk Declaration form was submitted to the Faculty of Health at the University of Technology Sydney and the Faculty agreed that the project did not require review from the UTS Human Research Ethics Committee (HREC), as the doctoral project is a secondary data analysis.

Participants in this sub-study were informed that the sub-study was part of the ALSWH and their responses to the sub-study questionnaire might be linked to information they had already provided in the main ALSWH surveys. Women were also made aware that their participation was voluntary and that if they chose not to participate in the sub-study, this would not affect their continuation of participation in the main ALSWH. As the sub-study survey was a self-administered mailed questionnaire, participants had to provide a written consent regarding their participation by signing the consent form included within the questionnaire.

Participants were given a free call number to assist them with answering any questions regarding the questionnaire. As the survey was for women who were suffering from back pain, the participants were directed to relevant support facilities to assist them if they had any health concerns. The following statements were included at the beginning of the survey detailing 'how to complete this survey';

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 131114 (local call).

Also, the ALSWH website has detailed information for participants such as contact phone numbers, email address and physical address for any query regarding the study.

3.9 Chapter summary

In this chapter, methodology, participants, survey questionnaire, data analysis and ethical considerations was outlined for the study reported in this thesis. Details of methods will further be described in the results chapters.

4 Consultations with complementary and alternative medicine practitioners amongst wider care options for back pain: a nationally representative sample of 1,310 Australian women aged 60-65 years

4.1 Chapter introduction

This chapter will present the results of the examination of prevalence and patterns of CAM practitioner consultations for back pain. The chapter will provide the rationale for the analysis of the data collected from the sub-study and will present the findings. Thereby, this chapter will address the Research Question 2 (See Section 1.3.2, 2).

4.1.1 The rationale for this analysis within the broader research project

The aims and objectives of this research as outlined in Chapter 1 (Section 1.3.2, 2) requires an understanding of the prevalence of women's consultations with CAM practitioners for back pain as well as characteristics of women who consult a CAM practitioner for their back pain. Determining the patterns of women's consultations with CAM practitioners for back pain will identify the level of CAM practitioner use as well as the differences in the rates of consultations with practitioners of specific CAM modalities for back pain. Further, by examining women's CAM practitioner consultations for back pain in relation to their conventional medical and allied health care utilisation will provide an opportunity to understand whether there are affinities between certain CAM modalities and conventional medical back pain care provider utilisation. The identification of women's patterns of integrating certain CAM modalities with conventional medical/allied health care providers will determine whether it warrants closer examination of coherence or discordance between practitioner groups within the context of therapeutic pluralism in back pain care. With this in mind, this chapter reports the prevalence of use and characteristics of women who use CAM practitioners for back pain. This approach was undertaken to answer

Research Question 2 of the project. The analysis from this chapter was drawn from data gathered through the sub-study survey as well as the sixth (main) ALSWH survey. Responses to a number of survey items in the sub-study questionnaire were used for data analysis and some responses from the sixth ALSWH survey items regarding socio-demographic characteristics and participants' spending ability with regard to CAM therapies were used for analysis. Some items were recoded where appropriate to consolidate the number of categories within each item, typically due to a low frequency of responses for some categories.

Basic demographic data was described from the responses to Questions 99, 108, and 110 of the 'sixth ALSWH survey for the women of the 1946-51 cohort (2010)' questionnaire. Response to Question 99 'how do you manage on the income you have available?' was recoded to consolidate the 5 original response options to 4 categories: *it is impossible/it is difficult all the time; it is difficult some of the time; it is not too bad; it is easy*. Question 108 regarding highest educational qualification was recoded to consolidate 7 response options to 4 categories: *no formal qualifications; school or intermediate certificate/high school or leaving certificate; trade/apprenticeship/certificate/diploma; university degree/ higher university degree*. Likewise, Question 110 regarding marital status was recoded to generate 3 categories from the 7 response options in the original item: *married/de facto relationship (opposite sex)/de facto relationship (same sex); separated/divorced/widowed; never married*. Data on area of residence was obtained from the postcode of residence mentioned by the participants in the sixth ALSWH survey and the area of residence was categorised as urban or rural/remote (see Section 3.5.2). These items were identified as relevant to the interpretation of the analysis results as urban or rural/remote residence, income, educational qualifications and marital status have been reported to influence women's use of CAM in general (Ong, C. et al., 2002) and also on women's use of CAM for back pain (Broom et al., 2012a).

Health service utilisation data was determined through analysis of Questions 7, 9 and 11 of the sub-study survey. The inclusion of Question 7 was decided in order to gain insight into the extent of use of CAM practitioners by women within the wider care options for back pain care in Australia. Demographic data in relation to women's consultation or non-consultation with specific CAM practitioner groups was analysed

as it provides an opportunity to understand the variations of demographic characteristics of women with regard to their consultations with practitioners of specific CAM modalities. Such analysis is important as previous research has identified the influence of demographic characteristics on women's choice of CAM in general (Wade et al., 2008) and therefore the purpose of this analysis was to investigate whether demographic characteristics have an influence also on women's choice of CAM for back pain. Question 7 was recoded to 7 categories from the original 12 categories by combining q7b, q7c, q7i, q7j, q7k and q7l. These items were the response options for consultations with an aromatherapist, craniosacral therapist, reflexologist, reiki therapist, traditional Chinese medicine practitioner and other CAM therapist categories respectively. These combined categories are presented as "Other CAM" (see Table 4.1). A decision to combine aromatherapist, craniosacral therapist, reflexologist, reiki therapist, traditional Chinese medicine practitioner and other CAM practitioner categories was based on the significantly lower prevalence of the afore named practitioner groups (following the initial data analysis) in comparison to the more frequently used practitioner groups; acupuncturist, herbalist/naturopath, massage therapist, meditation/yoga practitioner and/or osteopath. A clear picture obtained through rates of consultations with popular CAM practitioner groups assists in understanding the landscape of women's consultation patterns within the context of CAM practitioner choices in contemporary back pain care in Australia. Question 9 and Question 11 were analysed for the purpose of comparing women's consultations with allied health care providers and/or conventional medical care providers in relation to women's consultations with different CAM practitioner groups. Information obtained from understanding women's consultation patterns across conventional medical, allied health care and CAM practitioner groups is necessary to gain a picture of the broader health services utilisation by back pain sufferers. For determining the health service utilisation across conventional medical, allied health care and CAM practitioner use, response options for Question 7, 9 and 11 were recoded for one component of the analysis to represent a binary variable whereby consultation with each respective practitioner group was categorised as 'yes' or 'no'.

Question 39 of the sub-study survey was analysed to determine women's use of conventional medical providers and CAM practitioner groups for back pain related symptoms; headaches/migraines, nausea, neck pain, leg pain/sciatica, arm pain, pins and needles/numbness, stiffness, fatigue, weakness, depression, sleeping problems,

instability, muscle spasm and anxiety/tension. These items were presented as 'yes' or 'no' for each of the back pain related symptoms and women's consultations with an acupuncturist, chiropractor, herbalist/naturopath, massage therapist, yoga/meditation practitioner, osteopath, other CAM practitioner and overall CAM practitioner consultations (represented as 'Total CAM').

The results contained within this chapter have been published as follows:

Murthy V, Sibbritt D, Adams J, Broom A, Kirby E, Refshauge KM. Consultations with complementary and alternative medicine practitioners amongst wider care options for back pain: a study of a nationally representative sample of 1,310 Australian women aged 60–65 years. *Clinical rheumatology* 2014; 33:253-262.

A copy of the manuscript is attached to this thesis as Appendix 5.

4.2 Background

4.2.1 Back pain burden and the use of CAM amongst a range of treatment options

Back pain is a significant health service issue (Buchbinder et al., 2001; Walker, B. F. et al., 2004a) affecting adult populations in Australia, the US, and the UK (Nachemson et al., 2000; Walker, B. F. et al., 2004a). Back pain is the second most common complaint in general practice (Sibbritt, D. & Adams, J., 2010) and presents a major economic burden in Australia with both direct and indirect costs exceeding AUD 8 billion per annum (Access Economics, 2001; Buchbinder et al., 2001; Kent & Keating, 2005). Surveys report ageing and being female as predictors of debilitating back pain (Walker, B. F. et al., 2004a; Webb et al., 2003), and research has identified 55 % of women aged 56–61 years reporting back pain (Broom et al., 2012a).

4.2.2 CAM use across a range of treatment options for back pain

Use of complementary and alternative medicine (CAM) is common for musculoskeletal conditions (Ong, C. K. et al., 2004; Wade et al., 2008; Xue, C., C L

et al., 2008), and women are known to use CAM for back pain (Haetzman et al., 2003; Ong, C. K. et al., 2004; Wade et al., 2008). Back pain sufferers can draw upon a range of possible practitioners who comprise three broad provider categories. Conventional medical practitioners core to the biomedical model and medical curriculum (General Practitioners (GPs), orthopaedic specialists, neurologists, rheumatologists) (Breivik et al., 2006; Côté et al., 2001; Haetzman et al., 2003; Mortimer & Ahlberg, 2003; Ramos-Remus & Raut, 2008; Wade et al., 2008; Xue, C., C L et al., 2008), allied health care practitioners, associated with the biomedical model and who traditionally closely assist the conventional medical profession in service provision (physiotherapists, nurses, pharmacists) (Breivik et al., 2006; Côté et al., 2001; Haetzman et al., 2003; Hughes, C. et al., 2011; Mortimer & Ahlberg, 2003), and CAM practitioners not traditionally associated with biomedicine or the medical curriculum (acupuncturists, chiropractors, herbalists or naturopaths, massage therapists, osteopaths, yoga and meditation practitioners, aroma therapists, reflexologists, reiki therapists, traditional Chinese medicine practitioners, craniosacral therapists) (Breivik et al., 2006; Burke et al., 2006; Côté et al., 2001; Haetzman et al., 2003; Hughes, C. et al., 2011; Mortimer & Ahlberg, 2003; Ong, C. K. et al., 2004; Ramos-Remus & Raut, 2008; Sibbritt, D et al., 2011; Sibbritt, D. W. et al., 2005; Wade et al., 2008; Xue, C., C L et al., 2008).

Back pain sufferers who use CAM do so alongside seeking care from conventional medical and allied health care providers (Breivik et al., 2006; Côté et al., 2001; Haetzman et al., 2003; Mortimer & Ahlberg, 2003; Xue, C., C L et al., 2008), with the occasional exception of exclusive CAM use (Haetzman et al., 2003)]. US research (n=808) on women reported that 41% of participants suffered back pain, and 34 % of these had used CAM to treat their condition (Wade et al., 2008). Back pain sufferers who consult a medical practitioner are more likely to consult a chiropractor or acupuncturist (Xue, C., C L et al., 2008) when compared with those who do not consult a medical practitioner. While there is cultural and political variation influencing CAM use across countries, chiropractic, massage, acupuncture, and osteopathy appear to be the most commonly used CAM modalities for treating back pain (Breivik et al., 2006; Côté et al., 2001; Mortimer & Ahlberg, 2003; Xue, C., C L et al., 2008).

A US national survey of adults using acupuncture (n=31,044) showed 34% had acupuncture treatments for back pain (Burke et al., 2006). Surveys from Europe with comparable population samples report chiropractic as amongst the most common treatments for back pain with prevalence rates around 12–14% (Côté et al., 2001; Ong, C. K. et al., 2004). As for other treatment providers, a survey from a US nationally representative sample found 12% of back pain sufferers had used conventional healthcare (Wolsko et al., 2003). An Australian study indicated that 35% of women aged 56–61 years with back pain consulted a conventional medical practitioner (Broom et al., 2012a). Another Australian study of adults with back pain reported 25% as consulting a GP, 13% as consulting a physiotherapist, 10% as consulting a pharmacist, and 1% as consulting a nurse (Walker, B. F. et al., 2004a).

4.2.3 A lack of clinical base to guide patient decision-making

Studies on the efficacy of treatments for back pain (conventional, allied, and CAM) remain inconclusive (Deshpande et al., 2007; Furlan et al., 2005; Licciardone, J. et al., 2005; Rubinstein, S. M. et al., 2011; van Tulder, M. et al., 2000; Walker, B. F. et al., 2010; Williams, K. et al., 2009). The challenge facing back pain sufferers in choosing between the many practitioners available appears exacerbated by the confusion amongst different provider groups regarding each other's respective practices and approaches to back pain care (Rainville, Bagnall & Phalen, 1995) - a confusion which may be due to different practitioner groups holding different beliefs and attitudes towards back pain and its management (Côté et al., 2001; Hughes, C. et al., 2011; Nachemson et al., 2000; Pincus et al., 2007; Wolsko et al., 2003). As such, there is a lack of clear evidence base to guide patients' decision-making and health-seeking behaviour around back pain.

4.2.4 Inter-professional relations across back pain care

Very little is known about the attitudes of conventional medical and allied health care practitioners towards CAM practitioners with regards to back pain care. However, there is research on the general attitude of GPs towards CAM. Australian research suggests GPs perceive acupuncture, massage, and yoga as generally effective and

safe (Cohen, M M et al., 2005; Pirodda, M. et al., 2002), and either encourage use or refer patients to these therapies. In contrast, GPs appear to perceive naturopathy, chiropractic, and osteopathy as less effective and potentially more harmful (Norris, 2001) with GPs actively discouraging naturopathy (Cohen, M M et al., 2005). It is not known whether this is the case with regards to back pain.

A survey of UK GPs identified substantial referrals to CAM practitioners (Van Haselen et al., 2004) with GPs more likely to refer patients to acupuncturists, homeopaths, and massage therapists, most commonly for musculoskeletal conditions (Van Haselen et al., 2004) in response to patient requests, when conventional treatments had failed or when certain CAM were seen as effective (Van Haselen et al., 2004). A US study identified that GPs did not formally refer patients to chiropractors (despite being generally positive towards chiropractic) (Greene et al., 2006). An Australian study identified pharmacists as supportive of CAM and as recommending herbal medicines and supplements frequently for back pain (Naidu, Wilkinson & Simpson, 2005). Other studies highlight the central role of pharmacists in counselling customers on CAM use (Brown, J. et al., 2008; Farrell et al., 2008; Kanjanarach, T, Krass, I & Cumming, R G, 2011; Olatunde et al., 2010) and show nurses as supporting and recommending CAM to their patients (Sewitch et al., 2008). However, it is not known if these results hold for back pain care.

4.2.5 A need for research on CAM use for back pain

Much is known about broader CAM use (Côté et al., 2001; Robinson & McGrail, 2004). For example, women are higher conventional and CAM treatment users than men (Burke et al., 2006; Haetzman et al., 2003; Mortimer & Ahlberg, 2003; Ong, C. K. et al., 2004; Wade et al., 2008; Xue, C., C L et al., 2008), and women using CAM tend to be more educated and have higher income than those who do not use CAM (Broom et al., 2012a; Burke et al., 2006; Ong, C. K. et al., 2004; Sibbritt, D. W., & Adams, J., 2010; Thomas et al., 2001). Whilst in general CAM use by women is higher in urban than rural areas (Thomas et al., 2001), the contrary has been shown in a large study reporting higher use of CAM amongst rural women (Adams, J. et al., 2003). However, few studies have investigated CAM use specific to back pain care

(Côté et al., 2001; Hughes, C. et al., 2011; Ong, C. K. et al., 2004) or differentiated CAM practitioner consultations (Côté et al., 2001; Ong, C. K. et al., 2004) from self-prescribed CAM treatments for back pain. In response, this paper examines women's consultations with a range of CAM practitioners for back pain in Australia.

4.3 Methods

4.3.1 Sample

This research was a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH was designed to investigate multiple factors affecting the health and well-being of women over a 20-year period. Relevant ethical approval was gained from the Human Ethics Committee at the University of Queensland and University of Newcastle, Australia. Women in three age groups were randomly selected from the national Medicare database and invited by mail to participate. The focus of this study is women from the 1946-51 cohort aged 60-65 years in the sub-study survey conducted during 2011/2012. At the sixth ALSWH survey, 10,011 women consented to participate, and the respondents were shown to be broadly representative of the national population of women in the target age group. For this sub-study, 1,851 women who had indicated in the sixth ALSWH survey (2010) that they had experienced back pain were mailed a questionnaire. Of these women, 1,620 were deemed eligible, and 1,310 (80.9%) returned completed sub-study questionnaires.

4.3.2 Demographic characteristics

The marital status, urban or rural residence, highest educational qualification the participants had completed, and their spending ability with regard to CAM therapies as reported in the sixth ALSWH survey during 2010 were utilised to extrapolate the demographic characteristics in this sub-study.

4.3.3 Consultations with CAM practitioners

The women were asked if they had consulted CAM practitioners for back pain in the previous twelve months and questioned about the frequency of consultations and the forms of CAM practice they had used (i.e. acupuncturist, aroma therapist, craniosacral therapist, chiropractor, herbalist/naturopath, massage therapist, meditation, yoga, osteopath, reflexologist, reiki therapist, traditional Chinese medicine practitioner, and any other forms of CAM). The women were also asked about their consultations with CAM practitioners for symptoms and conditions relating to back pain.

4.3.4 Conventional medical and Allied Health Care Utilisation

Women were asked about their visits to conventional medical practitioners including GPs, specialists and allied health care professionals (physiotherapists, occupational therapists, nurses, pharmacists).

4.3.5 Statistical analyses

Descriptive statistics were employed including frequencies and percentages. Pearson's chi-square tests were used to compare categorical variables. For multivariate analyses, we used logistic regression by using a technique of backward elimination model building. All analyses were conducted using the statistical software package STATA 11.2.

4.4 Results

There were 1,310 women who responded to the survey, constituting a response rate of 80.9%. Of these women, 76.4% (n=1,001) had consulted one or more types of CAM practitioner for back pain in the previous 12 months. Table 4.1 reports CAM consultations by women for back pain and lists consultations with six specific forms of

CAM. From a total of 1,928 consultations with a CAM practitioner, the highest number was with a massage therapist (n=578, 41.4%), followed by a chiropractor (n=488, 37.3%), acupuncturist (n=174, 13.3%), herbalist or naturopath (n=125, 9.5%), meditation or yoga practitioner (n=124, 9.5%), and osteopath (n=115, 8.8%). Women had consulted other forms of CAM practitioner such as reiki therapist, reflexologist, traditional Chinese medicine practitioner, aroma therapist, and craniosacral therapist less frequently (n=324, 24.8%).

Women with no formal education were less likely to consult an acupuncturist for back pain ($p<0.05$). Women residing in urban areas were more likely to use a massage therapist and yoga and meditation practitioner than those in non-urban areas ($p<0.05$) while women who were married or in a de facto relationship were more likely to consult with an osteopath ($p<0.05$) (Table 4.1).

Table 4.1 Women's consultations with Complementary and Alternative Medicine (CAM) practitioners for back pain by demographic characteristics

	Acupuncturist		Chiropractor		Herbalist / Naturopath		Massage therapist		Yoga / Meditation		Osteopath		Other CAM		Total CAM	
Demographics	Yes n=174	No n=1136	Yes n=488	No n=822	Yes n=125	No n=1185	Yes n=578	No n=732	Yes n=124	No n=1186	Yes n=115	No n=1195	Yes n=324	No n=986	Yes n=1001	No n=309
Education^A																
No formal education	15%	9%	9%	11%	8%	10%	11%	10%	11%	10%	7%	10%	10%	10%	10%	11%
High school	37%	40%	39%	40%	38%	40%	41%	39%	39%	40%	44%	40%	41%	39%	39%	41%
Trade diploma	23%	21%	22%	21%	25%	21%	20%	22%	22%	21%	24%	21%	22%	21%	22%	20%
University	25%	30%	30%	28%	29%	29%	28%	29%	28%	29%	25%	29%	27%	30%	29%	28%
Income																
Difficult to manage	15%	11%	11%	12%	11%	12%	11%	12%	13%	12%	14%	11%	12%	12%	12%	11%
Sometimes difficult	22%	22%	23%	22%	28%	22%	21%	24%	19%	23%	20%	23%	22%	22%	22%	25%
Not too bad	47%	45%	46%	44%	43%	45%	47%	43%	49%	44%	47%	45%	48%	44%	46%	40%
Easy to manage	16%	22%	20%	22%	18%	21%	21%	21%	19%	21%	19%	21%	18%	22%	20%	24%
Marital Status^B																
Married/defacto	74%	75%	74%	75%	76%	74%	75%	74%	77%	74%	73%	75%	73%	75%	75%	74%
Separated/divorced/ widowed	23%	21%	23%	21%	20%	22%	21%	22%	21%	22%	27%	21%	23%	21%	22%	21%
Never married	3%	4%	3%	4%	4%	4%	4%	4%	2%	4%	0%	4%	4%	4%	3%	5%
Residence^{CD}																
Urban	90%	90%	91%	90%	88%	91%	93%	88%	84%	91%	94%	90%	88%	91%	91%	88%
Rural	10%	10%	8%	10%	12%	9%	7%	12%	16%	9%	6%	10%	12%	9%	9%	12%

^A statistically significant association with acupuncturist (p < 0.05)

^B statistically significant association with osteopath (p < 0.05)

^C statistically significant association with massage therapist (p < 0.05)

^D statistically significant association with yoga/meditation (p < 0.05)

A comparison of women's consultations with CAM practitioners and their consultations with other health care providers for back pain is presented in Table 4.2. There were significant, positive associations between consultations with most CAM practitioners and consultations with most conventional health care practitioners. However, the likelihood of consulting with a chiropractor decreased for women who consulted with a GP or a physiotherapist ($p < 0.05$).

Table 4.2 Women's health service utilization and CAM consultations for back pain

	Acupuncturist		Chiropractor		Herbalist / Naturopath		Massage therapist		Yoga / Meditation		Osteopath		Other CAM		Total CAM	
Consultations	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	n=174	n=1136	n=488	n=822	n=125	n=1185	n=578	n=732	n=124	n=1186	n=115	n=1195	n=324	n=986	n=1001	n=309
GP ABCG																
Never	35%	45%	53%	38%	29%	45%	40%	46%	37%	44%	44%	44%	37%	46%	44%	41%
1 or 2 times	30%	24%	22%	27%	29%	24%	27%	24%	23%	25%	22%	25%	27%	24%	25%	26%
More than 3 times	35%	31%	25%	35%	42%	30%	33%	30%	40%	31%	34%	31%	36%	30%	31%	32%
Orthopaedic Surgeon^{CE}																
Never	90%	92%	93%	91%	86%	92%	91%	92%	87%	92%	89%	92%	91%	92%	92%	91%
1 or 2 times	6%	6%	5%	7%	8%	6%	7%	6%	9%	6%	9%	6%	7%	6%	6%	6%
More than 3 times	4%	2%	2%	2%	6%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	3%
Neurologist																
Never	93%	96%	96%	96%	95%	96%	96%	96%	94%	96%	95%	96%	95%	96%	96%	95%
1 or 2 times	5%	3%	3%	3%	2%	3%	3%	3%	4%	3%	4%	3%	4%	3%	3%	3%
More than 3 times	2%	1%	1%	1%	3%	1%	1%	1%	2%	1%	1%	1%	1%	1%	1%	2%
Rheumatologist																
Never	93%	94%	95%	93%	90%	94%	92%	94%	92%	94%	94%	94%	92%	94%	94%	93%
1 or 2 times	4%	4%	3%	5%	5%	4%	5%	4%	5%	4%	3%	4%	5%	4%	4%	4%
More than 3 times	3%	2%	2%	2%	5%	2%	3%	2%	3%	2%	3%	2%	3%	2%	2%	3%
Physiotherapist ABDEGH																
Never	49%	65%	69%	59%	65%	63%	54%	70%	56%	64%	65%	63%	52%	66%	61%	69%
1 or 2 times	13%	13%	13%	13%	12%	13%	15%	11%	20%	12%	15%	13%	15%	13%	13%	13%
More than 3 times	38%	22%	18%	28%	23%	24%	31%	19%	24%	24%	21%	24%	33%	21%	26%	18%

Occupational Therapist ^{CEFG}																	
Never	97%	97%	98%	96%	94%	98%	96%	98%	94%	97%	95%	97%	96%	98%	97%	97%	
1 or 2 times	1%	2%	1%	2%	4%	1%	2%	1%	3%	2%	4%	1%	3%	1%	2%	1%	
More than 3 times	2%	1%	1%	2%	2%	1%	2%	1%	3%	1%	1%	2%	1%	1%	1%	2%	
Nurse ^{ADEG}																	
Never	94%	97%	97	96%	93%	97%	96%	97%	93%	97%	93%	95%	95%	97%	96%	97%	
1 or 2 times	1%	1%	1%	1%	3%	1%	2%	1%	5%	1%	2%	1%	3%	1%	2%	1%	
More than 3 times	5%	2%	2%	3%	4%	2%	2%	2%	2%	2%	5%	2%	2%	2%	2%	2%	
Pharmacist ^{CDEH}																	
Never	79%	78%	79%	77%	62%	80%	73%	82%	67%	78%	73%	78%	74%	79%	76%	84%	
1 or 2 times	9%	10%	10%	10%	12%	9%	13%	7%	11%	10%	12%	10%	11%	10%	11%	7%	
More than 3 times	12%	12%	11%	13%	26%	11%	14%	11%	22%	12%	15%	12%	15%	11%	13%	9%	

^A statistically significant association with Acupuncturist ($p < 0.05$)

^B statistically significant association with Chiropractor ($p < 0.05$)

^C statistically significant association with Herbalist/Naturopath ($p < 0.05$)

^D statistically significant association with Massage therapist ($p < 0.05$)

^E statistically significant association with Yoga/Meditation ($p < 0.05$)

^F statistically significant association with Osteopath ($p < 0.05$)

^G statistically significant association with Other CAM ($p < 0.05$)

^H statistically significant association with Total CAM consultations ($p < 0.05$)

The women's use of specific CAM modalities for symptoms relating to back pain is provided in Table 4.3. With the exception of nausea, there were significant, positive associations between experiencing all other symptoms and consultations with most CAM practitioners.

Table 4.3 CAM consultations by women for associated symptoms

		Acupuncturist		Chiropractor		Herbalist / Naturopath		Massage therapist		Yoga / Meditation		Osteopath		Other CAM		Total CAM	
Symptoms		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
		n=174	n=1136	n=488	n=822	n=125	n=1185	n=578	n=732	n=124	n=1186	n=115	n=1195	n=324	n=986	n=1001	n=309
Headaches ABCDEFH	Yes	40%	28%	38%	25%	41%	29%	36%	25%	40%	29%	39%	29%	30%	30%	33%	18%
	No	60%	72%	62%	75%	59%	71%	64%	75%	60%	71%	61%	71%	70%	70%	67%	82%
Nausea	Yes	13%	11%	12%	11%	18%	11%	13%	10%	13%	11%	10%	11%	14%	11%	12%	8%
	No	87%	89%	88%	89%	82%	89%	87%	90%	87%	89%	90%	89%	86%	89%	88%	92%
Neck pain ABCDEFH	Yes	70%	58%	76%	50%	75%	58%	71%	51%	69%	59%	75%	58%	64%	58%	68%	33%
	No	30%	42%	24%	50%	25%	42%	29%	49%	31%	41%	25%	42%	36%	42%	32%	67%
Leg pain ABCDGFH	Yes	68%	55%	61%	54%	69%	55%	61%	53%	60%	56%	66%	56%	63%	55%	60%	45%
	No	32%	45%	39%	46%	31%	45%	38%	47%	40%	44%	34%	44%	37%	45%	40%	55%
Arm pain ABCDEH	Yes	39%	29%	34%	27%	38%	29%	37%	24%	38%	29%	35%	30%	33%	29%	33%	20%
	No	61%	71%	66%	73%	62%	71%	63%	76%	62%	71%	65%	70%	67%	71%	67%	80%
Pins & needles, numbness ACDH	Yes	40%	30%	33%	31%	42%	31%	35%	29%	35%	31%	37%	31%	34%	31%	34%	24%
	No	60%	70%	67%	69%	58%	69%	65%	71%	65%	69%	63%	69%	66%	69%	66%	76%

Stiffness ACDEGH	Yes	57%	44%	50%	43%	62%	44%	54%	39%	55%	45%	59%	44%	49%	44%	51%	30%
	No	43%	56%	50%	57%	38%	56%	46%	61%	45%	55%	41%	56%	51%	56%	49%	70%
Fatigue ACDEGH	Yes	31%	24%	26%	24%	48%	23%	28%	23%	38%	24%	30%	25%	31%	23%	27%	20%
	No	69%	76%	74%	76%	52%	77%	72%	77%	62%	76%	70%	75%	69%	77%	73%	80%
Weakness CE	Yes	22%	19%	19%	19%	30%	18%	19%	20%	26%	18%	21%	19%	21%	18%	20%	16%
	No	78%	81%	81%	81%	70%	82%	81%	80%	74%	82%	79%	81%	79%	82%	80%	84%
Depression ACDH	Yes	26%	19%	20%	19%	36%	18%	23%	17%	25%	19%	23%	19%	22%	19%	21%	15%
	No	74%	81%	80%	81%	64%	82%	77%	83%	75%	81%	77%	81%	78%	81%	79%	85%
Sleeping problems ABCDG	Yes	40%	32%	29%	35%	50%	31%	37%	30%	37%	32%	30%	33%	40%	30%	33%	30%
	No	60%	68%	71%	65%	50%	69%	63%	70%	63%	68%	70%	67%	60%	70%	67%	70%
Instability CEF	Yes	9%	8%	7%	9%	18%	7%	8%	8%	14%	8%	15%	8%	9%	8%	8%	7%
	No	91%	92%	93%	91%	82%	93%	92%	92%	86%	92%	85%	92%	91%	92%	92%	93%
Muscle spasm ACDEFH	Yes	42%	32%	32%	35%	46%	32%	41%	28%	44%	33%	42%	33%	35%	33%	36%	25%
	No	58%	68%	68%	65%	54%	68%	59%	72%	56%	67%	58%	67%	65%	67%	64%	75%
Anxiety / tension CDEGH	Yes	32%	25%	26%	26%	48%	23%	30%	22%	37%	25%	24%	26%	33%	24%	28%	19%
	No	68%	75%	74%	74%	52%	77%	70%	78%	63%	75%	76%	74%	67%	76%	72%	81%

^A statistically significant association with Acupuncturist (p < 0.05)

^B statistically significant association with Chiropractor (p < 0.05)

^C statistically significant association with Herbalist/Naturopath (p < 0.05)

^D statistically significant association with Massage therapist (p < 0.05)

^E statistically significant association with Yoga/Meditation (p < 0.05)

^F statistically significant association with Osteopath (p < 0.05)

^G statistically significant association with Other CAM consultations (p < 0.05)

^H statistically significant association with Total CAM consultations (p < 0.05)

Table 4.4 shows the results of the multiple logistic regression modelling, identifying the factors associated with CAM practitioner consultations. Women were more likely to consult an acupuncturist if they: consulted with a physiotherapist three or more times in a year (OR=2.12; 95% CI: 1.49, 3.02), compared with women who did not consult with a physiotherapist, experienced headaches (OR=1.53; 95% CI: 1.09, 2.14), compared with women who did not experience headaches; or experienced leg pain (OR=1.52; 95% CI: 1.07, 2.15), compared with women who did not experience leg pain. Women were more likely to consult a chiropractor if they: experienced headaches (OR=1.42; 95% CI: 1.07, 1.89); neck pain (OR=3.12; 95% CI: 2.36, 4.14) or leg pain (OR=1.33; 95% CI: 1.02, 1.73). Women were less likely to consult with a chiropractor if they: consulted a GP one or two times per year (OR=0.70; 95% CI: 0.52, 0.95) or more than three times a year (OR=0.56; 95% CI: 0.41, 0.76), compared with women who did not consult a GP; consulted a physiotherapist more than three times a year (OR=0.53; 95% CI: 0.39, 0.72), compared with women who did not consult with a physiotherapist; experienced sleeping problems (OR=0.74, 95% CI: 0.56, 0.99); or experienced muscle spasms (OR=0.74, 95% CI: 0.56, 0.97). Women were more likely to consult an herbalist or naturopath if they: consulted a pharmacist three or more times per year (OR=2.42; 95% CI: 1.51, 3.89), compared with women who did not consult a pharmacist; experienced neck pain (OR=1.7; 95% CI: 1.09, 2.63); fatigue (OR=2.02; 95% CI: 1.32, 3.09); or anxiety and tension (OR=1.83; 95% CI: 1.19, 2.8).

Table 4.4 Factors associated with use of CAM by women suffering from back pain

	Acupuncturist		Chiropractor		Herbalist / Naturopath		Massage therapist		Yoga / Meditation		Osteopath		Other CAM		Total CAM	
	OR 95% CI	p	OR 95% CI	p	OR 95% CI	p	OR 95% CI	P	OR 95% CI	P	OR 95% CI	p	OR 95% CI	p	OR 95% CI	p
Area of Residence																
Urban							0.55	0.004	2.05	0.01						
GP Use																
Never			–												–	
1 or 2 times			0.70	0.02												
More than 3 times			0.56	<0.001											0.66	0.01
Physiotherapist																
Never	–		–				–						–			
1 or 2 times							1.56	0.01								
3 or more times	2.12	< 0.001	0.53	<0.001			2.03	<0.001					1.96	<0.001		
Occupational therapist																
Never													–			
1 or 2 times													2.8	0.03		
More than 3 times																

Nurse																
Never							–		–		–					
1 or 2 times							4.8	0.02	3.57	0.02						
More than 3 times											3.4	0.01				
Pharmacist																
Never					–		–								–	
1 or 2 times							2.08	<0.001							1.99	0.009
More than 3 times					2.42	<0.001			2.14	0.003					1.99	0.005
Headaches	1.53	0.01	1.42	0.01												
Neck pain			3.12	<0.001	1.7	0.02	1.94	<0.001			1.85	0.01			3.77	<0.001
Leg pain	1.52	0.02	1.33	0.04												
Arm pain							1.36	0.04								
Stiffness							1.47	0.004							1.58	0.003
Fatigue					2.02	<0.001			1.81	0.003						
Weakness							0.52	<0.001								
Sleeping problems			0.74	0.04							0.58	0.02				
Instability											1.98	0.03				
Muscle spasm			0.74	0.03												
Anxiety/tension					1.83	0.01	1.34	0.04					1.56	0.002		

Women were more likely to consult a massage therapist if they: consulted a physiotherapist three or more times a year (OR=2.03; 95% CI: 1.54, 2.69), compared with women who did not consult a physiotherapist; consulted a nurse one or two times per year (OR=4.8; 95% CI: 1.3, 17.69), compared with women who did not consult a nurse; consulted a pharmacist one or two times per year (OR=2.08; 95% CI: 1.4, 3.09), compared with women who did not consult a pharmacist; experienced neck pain (OR=1.94; 95% CI: 1.49, 2.54); arm pain (OR=1.36; 95% CI: 0.02, 1.8); stiffness (OR=1.47; 95% CI: 1.13, 1.92); or anxiety and tension (OR=1.34; 95% CI: 1.01, 1.78). Women were less likely to consult a massage therapist if they: resided in an urban area (OR=0.55; CI: 0.36, 0.82); or experienced weakness (OR=0.52; 95% CI: 0.37, 0.73). Women were more likely to consult a yoga and meditation practitioner if they: consulted with a nurse one or two times in a year (OR=3.57; 95% CI: 1.25, 10.18), compared with women who did not consult a nurse; consulted with a pharmacist three or more times a year (OR=2.14; 95% CI: 1.29, 3.54), compared with women who did not consult a pharmacist; or experienced fatigue (OR=1.81; 95% CI: 1.22, 2.7). Women were more likely to consult an osteopath if they: consulted with a nurse three or more times in a year (OR=3.4; 95% CI: 1.29, 8.92), compared with women who did not consult a nurse; experienced neck pain (OR=1.85; 95% CI: 1.16, 2.96); or instability (OR=1.98; 95% CI: 1.07, 3.67). However, women were 0.58 (95% CI: 0.36, 0.92) times less likely to consult an osteopath if they experienced sleeping problems, compared with women who did not experience sleeping problems.

4.5 Discussion

This paper presents the first examination of CAM practitioner consultancy patterns for back pain within the context of wider care options from the survey of a large, nationally representative sample of Australian women aged 60 to 65 years. Our analysis identifies four key findings. First, our analysis reveals a high level of CAM practitioner use for back pain with more than three quarters of the women consulting a CAM practitioner alongside conventional and allied health care practitioners. The high level of CAM practitioner use for back pain is in line with results from previous studies on CAM utilisation amongst women (Wade et al., 2008) and the wider population (Broom et al., 2012a; Walker, B. F. et al., 2004a). Women's use of

conventional medical and allied health care practitioners alongside CAM practitioners suggests that women may take an explorative approach wherein they try out different treatment options due to lack of efficacious treatments. When considered alongside the fact that back pain sufferers often choose not to disclose CAM use to their GP due to presumed GP disinterest or disapproval (Robinson & McGrail, 2004; Wade et al., 2008), the possibility of reduced opportunities for optimal communication between patients and their health care practitioners on treatment options for back pain is highlighted.

Our analysis also shows that the income, educational level, and marital status of the women did not influence their consultations with CAM practitioners or their consultations with other health care practitioners for the treatment of their back pain. This finding contrasts to those from previous studies where higher income and higher education were characteristic of women's CAM usage (Haetzman et al., 2003; Mortimer & Ahlberg, 2003; Wade et al., 2008; Xue, C., C L et al., 2008). Although our bivariate analysis shows women with "no formal education" consult acupuncturists less frequently, our stepwise multiple regression model disproved such an association. Back pain sufferers may consult CAM practitioners due to low availability of efficacious conventional medical treatments for back pain (Furlan et al., 2005; Rubinstein, S. M. et al., 2011) and the possibility of adverse effects associated with pharmaceutical treatments (Deshpande et al., 2007; van Tulder, M. et al., 2000). Additionally, as benefits from CAM treatments and other allied health care options (Licciardone, J. et al., 2005; Walker, B. F. et al., 2010; Williams, K. et al., 2009) are only short term, back pain sufferers may be explorative in their choices of treatments irrespective of their socioeconomic position. The significant use of CAM practitioners by women alongside conventional medical and allied health care practitioner use raises questions about possible variations in back pain sufferers' notions of effectiveness of treatments, which requires further research.

Our analysis shows no association between women's consultations with CAM practitioners for back pain and their urban or rural residence, except for consultations with yoga and meditation practitioners and massage therapists, wherein women tended to reside in urban areas. Previous research has identified a mixed pattern of CAM use across urban and rural locations with different studies identifying greater use of CAM by women in urban (Thomas et al., 2001) and rural areas (Adams, J. et

al., 2003). Our finding that women who consult a yoga and meditation practitioner or a massage therapist predominantly reside in urban areas highlights the need for further research to determine the role of access to CAM practitioners in women's decision-making regarding their back pain treatment.

Third, our analysis shows women's consultations with chiropractors are diminished with increased consultations with conventional medical practitioners and physiotherapists. Although previous research has suggested conventional medical practitioners and allied health care providers favour chiropractors more readily than other CAM practitioners (Greene et al., 2006; Xue, C., C L et al., 2008), our finding identifies a potential discordance between GPs and physiotherapists on the one hand and chiropractors on the other. Despite some evidence on inter-professional discordance (Norris, 2001), further research is necessary to examine the extent to which such an assumption of discordance is based on conventional medical and allied health care practitioners' perceptions of the efficacy of chiropractic in back pain care and- or inter-professional competition in this area of health care provision. Furthermore, our analysis shows that back pain sufferers who consult a GP more frequently seek less help from CAM practitioners, indicating a possible discouragement of CAM use by GPs. This finding does appear to be in line with previous research indicating GP caution regarding CAM treatments for back pain (Cohen, M M et al., 2005).

Fourth, our study reveals women's higher CAM practitioner use for back pain is associated with frequent pharmacist visits. Pharmacists may be a key source of information on CAM for back pain sufferers as previous research has identified pharmacists as supportive of CAM and as having an important role in counselling customers on CAM use (Brown, J. et al., 2008; Farrell et al., 2008; Olatunde et al., 2010). It is likely that pharmacists would be familiar with over-the-counter CAM products for back pain as pharmacists can sell non-pharmaceutical remedies. However, recent research suggests pharmacists have limited knowledge or confidence in suggesting CAM treatments to customers (Brown, J. et al., 2008). Alternatively, the customer and vendor relationship within the context of pharmacist visits may facilitate professional dialogue about CAM decision-making for back pain treatments especially given that pharmacists consider CAM sales an important source of pharmacy income (Kanjanaarach, Tipaporn, Krass, Ines & Cumming, Robert G,

2011). Further research is necessary to examine the impact of pharmacists on decision-making of back pain sufferers' regarding CAM practitioner use.

The interpretation of our findings is limited by the fact that women's care-seeking for back pain is self-reported by the participants, and the results may be potentially affected by recall bias. Despite this, the ALSWH is a respected source of data for epidemiological research in Australia, and these limitations are countered by the insights provided by the first focused analysis of back pain sufferers' utilisation of CAM practitioners amidst other back pain care options.

4.6 Conclusions

Our study identifies substantial CAM practitioner use by women with back pain within a broader field of provision, and given the extent of concurrent care identified, there is a need for further research to examine the communication between patients and practitioners as well as across the diverse groups of providers offering back pain care. It is also important that future research investigate the decision-making and information seeking of back pain patients in relation to the possible use of CAM practitioners amongst other available service providers.

4.7 Chapter summary

The results from this chapter indicate a high level of CAM practitioner consultations by women with back pain. It also indicated that women's income, educational level or marital status did not influence their consultations with CAM practitioners for back pain. While such high rate of CAM practitioner consultations may partially be due to the lack of efficacious conventional medical treatments for back pain prompting back pain sufferers to explore other treatment options, there is a need for detailed enquiry into women's attitude toward CAM and other influencing factors contributing to such a high prevalence of CAM practitioner use (which is addressed in Chapter 6).

The findings in this chapter also indicated important variations in women's consultation patterns with CAM practitioners depending on the frequency of visits to a GP or an allied health care practitioner. In addition, given the concurrent use of conventional medical/allied health care and CAM practitioner consultations for back pain, such findings warrant further research on women's communication with back pain care providers influencing their choice of CAM practitioner groups (which is addressed in Chapter 7).

5 Self-prescribed complementary and alternative medicine use for back pain amongst a range of care options: Results from a nationally representative sample of 1,310 women aged 60-65 years

5.1 Chapter introduction

Whilst the previous chapter examined prevalence and patterns of CAM practitioner consultations for back pain, this chapter will report the prevalence and characteristics of women who self-prescribed CAM treatments for their back pain. The chapter will provide the rationale for the study and report the findings of the study. Thereby, this chapter will address the Research Question 3 (See Section 1.3.2, 3).

5.2 Rationale for this study within the broader research project

This study, within the wider context of investigating women's use of CAM for back pain, examined the use of self-prescribed CAM treatments separately from women's CAM practitioner use. Such distinct focus on self-prescribed CAM treatments is necessary as CAM is diverse (Wade et al., 2008) and factors linked to women who consult CAM practitioners may be vastly different from factors associated with women who self-prescribe CAM for their back pain. Therefore, in addressing the aims and objectives of this study (Chapter 1, Section 1.3.2,3), it is important to understand the prevalence of self-prescribed CAM treatments for back pain and the characteristic of women who self-prescribe CAM treatments. Further, establishing the prevalence of use of different forms of self-prescribed CAM treatments provides opportunity to identify popular forms of self-prescribed CAM treatments for back pain. Also, by examining self-prescribed CAM use by women with back pain in relation to their visits to GPs, specialists and allied health care professionals for back pain, will deepen the understanding of women's patterns of self-prescribing CAM treatments for back pain.

Such analyses will identify the possible concurrent use of self-prescribed CAM with GP administered treatments for back pain. Therefore, this chapter reports the prevalence and characteristics of women who self-prescribe CAM for back pain.

The data utilised for the analysis in this chapter is derived from the sub-study as well as the sixth (main) ALSWH survey. The socio-demographic data including area of residence, marital status, education and income were gathered from the sixth ALSWH survey. Responses to several questionnaire items from the sub-study survey regarding self-prescribed CAM and health care utilisation were used for data analysis. Some items from both the sixth ALSWH survey and the sub-study survey were recoded to consolidate the number of categories for each item, typically due to a low frequency of responses for some categories.

As the previous chapter identified that women's socio-demographic status did not influence their patterns of consultation with CAM practitioners for back pain, it was important to examine whether women's use of self-prescribed CAM showed any association with women's socio-demographic characteristics. Particularly given that the literature has shown socio-demographic characteristics as determinants for CAM use in general (Wade et al., 2008) as well as CAM use for back pain (Thomas et al., 2001).

Self-prescribed CAM treatments for back pain were determined through analysis of Question 13 (See Appendix 2 for specific questionnaire items) of the sub-study survey. The analysis of responses to Question 13 was decided, as most question items were self-prescribed CAM treatments. The question item on painkillers (e.g. Panadol, Nurofen) was excluded from the analysis, as painkillers are not a form of CAM treatments. Specifically, Question 13 was recoded to 6 categories from the original 8 response options for self-prescribed CAM treatments by combining q13g, q13h and q13i. These items were the response options for self-prescribed Chinese medicine, 'self-prayer' and 'other alternative therapies' respectively. Participants could specify any unlisted CAM treatments within the 'other alternative therapies' response option. These combined categories are presented as "Other alternative therapies" (see Table 5.1). A decision to combine Chinese medicine, self-prayer and 'other alternative therapies' was decided following an initial data analysis that revealed a significantly lower prevalence for these categories of self-prescribed CAM treatments

in comparison to the more frequently used self-prescribed CAM treatments (i.e. supplements, vitamins/minerals, yoga/meditation, herbal medicines and aromatherapy oils). For determining the self-prescribed CAM utilisation by women, the appropriate response options for Question 13 were recoded to represent a binary variable whereby self-prescribed CAM treatments for different response options were categorised as 'yes' or 'no'.

Women's conventional medical and allied health care utilisation was analysed from responses to Question 11 and Question 9 of the sub-study survey, respectively. The response options for Q9 and Q11 were consolidated to 3 categories: never, '1 or 2 times', and 'more than 3 times' (see Table 5.2) representing 'none', '1 or 2', and '3 or '4/5' or '6/7' or more' respectively.

The results contained within this chapter have been published as follows:

Murthy V, Sibbritt D, Adams J, Broom A, Kirby E, Refshauge KM. Self-prescribed complementary and alternative medicine use for back pain amongst a range of care options: results from a nationally representative sample of 1310 women aged 60-65 years. *Complementary Therapies in Medicine* 2014; 22 (1): 133-140.

A copy of the manuscript is attached to this thesis as Appendix 6.

5.3 Background

Back pain is a common and debilitating condition (Andersson, 1999; Deyo & Yuh-Jane, 1987; Nachemson et al., 2000; Walker, B. F. et al., 2004a; Webb et al., 2003) with a lifetime prevalence between 60% and 80% (Andersson, 1999; Deyo & Yuh-Jane, 1987; Nachemson et al., 2000; Walker, B. F. et al., 2004a). Due to its likelihood of recurrence (Pillastrini et al., 2012; Walker, B. F. et al., 2004a; Webb et al., 2003), chronicity (Pillastrini et al., 2012; Walker, B. F. et al., 2004a; Webb et al., 2003) and lack of effective management (Koes, B W et al., 2006; Pillastrini et al., 2012), self-prescribed CAM for back pain significantly reduces quality of life (Andersson, 1999) for sufferers. With an increasing prevalence (Walker, B. F. et al., 2004a; Webb et al., 2003) across developed countries (Nachemson et al., 2000; Walker, B. F. et al.,

2004a; Webb et al., 2003), back pain poses a major socioeconomic challenge now and in the future (Buchbinder et al., 2001; Maniadakis & Gray, 2000; Walker, B. F. et al., 2004a).

5.3.1 Back pain and CAM use

Complementary and alternative medicine (CAM) – both self-prescribed and practitioner-administered – are common amongst patients suffering from painful conditions (Marsh et al., 2009; Rao et al., 1999; Robinson & McGrail, 2004; Sleath et al., 2008). Back pain sufferers are known to seek help from a range of treatment providers and tend to use CAM in addition to conventional medical treatments (Breivik et al., 2006; Chenot et al., 2007; Côté et al., 2001; Haetzman et al., 2003; Mortimer & Ahlberg, 2003). It is known that women report back pain more than men (Walker, B. F. et al., 2004a; Webb et al., 2003) and longitudinal studies in Australia have identified back pain as a predominant complaint amongst mid-aged women (Broom et al., 2012a; Sibbritt, D. W. & Adams, J., 2010). Women who use CAM are known to be better educated, have higher income, and live in urban areas (Broom et al., 2012a; Haetzman et al., 2003; Ong, C. K. et al., 2004; Sibbritt, D. W., & Adams, J., 2010). Research identifies multiple drivers for CAM use including a perception of the importance of individual responsibility in maintaining health (Siahpush, 1999), of CAM as suitable for treating or preventing chronic health problems (Thomson et al., 2012) and of CAM treatments as natural (Bishop, Felicity L et al., 2007; Siahpush, 1999). Consumerism (Siahpush, 1999) and a sense of personal control (Bishop, Felicity L et al., 2007) have also been identified as drivers for CAM use.

Past research has largely investigated patients' use of CAM for painful conditions with few studies specific to CAM use for back pain (Adams, Jon, Sibbritt, David, et al., 2013; Chenot et al., 2007; Haetzman et al., 2003; Hughes, C. et al., 2011; Sibbritt, David et al., 2012; Wade et al., 2008). A recent study from Australia reported that substantial numbers of mid-age women with back pain consulted a CAM practitioner (76%), an allied health care practitioner (56%) and/or consulted a biomedical practitioner (59%) (Kirby, Broom, Sibbritt, Adams, et al., 2013). Another study from Australia reported on some of the common self-prescribed treatments (i.e.

vitamins/minerals, herbal medicines, yoga/meditation) amongst women who consulted practitioners for back pain care (Broom et al., 2012a). In addition, this study noted higher usage of self-prescribed CAM amongst back pain sufferers in comparison to those women who did not suffer from back pain (Broom et al., 2012a). However, to date, the prevalence and characteristics of women self-prescribing different CAM treatments for back pain is poorly understood and yet self-prescribed CAM has been shown to represent a substantial component of CAM use (Sibbritt, D. W., & Adams, J., 2010). Most studies of CAM usage for back pain either specifically investigate CAM practitioner utilisation (Ong, C. K. et al., 2004) or fail to clearly distinguish between self-prescribed CAM and CAM consultations (Côté et al., 2001).

5.3.2 Health care providers' attitudes towards CAM use

Although it is not clear whether conventional medical practitioners and allied health care practitioners support CAM use for back pain, broader focused research suggests that GPs support certain CAM modalities such as yoga (Cohen, M M et al., 2005) and nurses are supportive of CAM treatments in general (Sewitch et al., 2008; Shorofi & Arbon, 2010). An Australian study identified pharmacists as frequently recommending herbal medicines and supplements to customers for back pain (Naidu et al., 2005). However, there is also evidence that pharmacists do not feel confident to counsel their customers regarding CAM treatments (Kanjanaarach, T et al., 2011).

5.3.3 Issues around self-prescribed CAM use for back pain

The evidence base for herbal medicine, vitamins/minerals and supplements in the treatment of back pain is sparse (Gagnier, J. et al., 2006; Gagnier, Joel J, 2008); meanwhile, patients suffering from pain tend to use multiple substance-based remedies (Marsh et al., 2009) and a large proportion of patients who use CAM treatments do not report their CAM use to their conventional medical practitioners (Marsh et al., 2009; Robinson & McGrail, 2004; Sleath et al., 2008). As such, there are serious risks around possible incorrect self-diagnosis, delayed or inappropriate

care and potential adverse drug interactions with regards to self-prescribed CAM use for back pain (Marsh et al., 2009; Robinson & McGrail, 2004).

Despite knowledge of women's use of CAM for back pain (Broom et al., 2012a; Ong, C. K. et al., 2004; Sibbritt, D. W., & Adams, J., 2010), self-prescribed CAM use for back pain has received marginal focus in literature. Little is known about women's choices of specific forms of self-prescribed CAM treatments for back pain. In response, this paper reports findings from the first empirical examination of prevalence and characteristics of women who use self-prescribed CAM treatments for back pain.

5.4 Methods

5.4.1 Sample

The research reported here is a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH was designed to investigate multiple factors affecting the health and well-being of women over a 20-year period starting from 1996. Women in three age groups ('young' 18-23, 'mid' 45-50 and 'older' 70-75 years) were randomly selected from the national Medicare database. These participants have been shown to be broadly representative of the national population of women in the target age group (Brown, W. J. et al., 1999). The participants for this current sub-study were chosen from the 1946-51 cohort of women, who had indicated in the sixth ALSWH survey (2010) that they had experienced back pain. Of the 10,011 women who responded to the sixth ALSWH survey, 1,851 indicated having experienced back pain and these women were mailed the current sub-study questionnaire. Of those, 1,620 were deemed eligible and 1,310 (80.9%) women returned the completed questionnaire. The ethics approval for this sub-study was obtained from the Human Ethics Committees at the University of Queensland and the University of Newcastle, Australia.

5.4.2 Demographic characteristics

The demographic information recorded included marital status, area of residence, highest educational qualification completed, and their ability to manage on available income.

5.4.3 Self-prescribed CAM treatments for back pain

The women were asked about their frequency of using self-prescribed CAM treatments for back pain in the previous twelve months. The CAM treatments included were herbal medicines, vitamins or minerals, supplements (e.g. glucosamine, fish oil), yoga or meditation and aromatherapy oils.

5.4.4 Conventional and allied health service utilisation

Women were asked about the frequency of their visits to conventional medical practitioners including GPs, specialists and allied health care professionals including physiotherapists, occupational therapists, nurses and pharmacists.

5.4.5 Statistical analyses

Descriptive statistics were employed including frequencies and percentages. Pearson's chi-square tests were used to compare categorical variables. For multivariate analyses, logistic regression models were used, employing a technique of backward stepwise elimination model building that utilised the likelihood ratio test. For each model, the dependent variable was one of the self-prescribed CAM treatments and the independent variables considered were all of the demographic and healthcare utilisation measures. All analyses were conducted using the statistical software package STATA 11.2.

5.5 Results

Of the 1,310 women who completed and returned the questionnaire – constituting 80.9% response rate – 75.2% (n=985) had self-prescribed one or more CAM treatment for back pain in the previous twelve months. Table 5.1 reports the distribution of self-prescribed CAM use amongst women for back pain by demographic characteristics. The frequency of self-prescribed CAM use was highest for supplements (n=776, 59.2%), followed by vitamins/minerals (n=592, 45.2%), yoga/meditation (n=187, 14.3%), herbal medicines (n=172, 13.1%) and aromatherapy oils (n=112, 8.5%). Women who were separated, divorced or widowed were more likely to use herbal medicines ($p<0.05$) than those who were married or in a de facto relationship. Women's use of self-prescribed CAM for back pain was not significantly associated with levels of education, income, or urban/rural residency.

Table 5.1 The association between women's self-prescribed CAM treatments for back pain and demographic characteristics

Demographic Characteristics	Herbal medicines		Vitamins/ Minerals		Supplements		Yoga/Meditation		Aromatherapy oils		Other Alternative Therapies		Total Self-prescriptions	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	n=172	n=1138	n=592	n=718	n=776	n=534	n=187	n=1123	n=112	n=1198	n=329	n=981	n=985	n=325
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Education														
No formal	13	10	10	10	9	11	14	9	12	10	12	9	10	10
High school	37	40	38	41	40	40	39	40	38	40	36	41	39	43
Trade diploma	20	21	20	22	20	23	24	21	23	21	25	20	21	20
University	30	29	32	27	31	26	23	30	27	29	27	30	30	27
Income														
Difficult to manage	14	12	12	12	13	11	15	11	14	12	14	11	13	9
Sometimes difficult	27	22	22	23	22	22	24	22	23	22	22	22	22	23
Not too bad	41	45	44	45	44	46	44	45	40	45	48	44	45	45
Easy to manage	18	21	22	20	21	21	17	22	23	21	16	23	20	23
Marital Status ^A														
Never married	1	4	4	4	4	3	2	4	1	4	3	4	4	4
Married/de facto	74	75	73	76	73	78	78	74	71	75	73	75	73	79
Separated/divorced/ widowed	25	21	23	20	23	19	20	22	28	21	24	21	23	17
Residence														
Urban	91	90	90	90	90	90	87	91	91	90	91	90	90	90
Rural	9	10	10	10	10	10	13	9	9	10	9	10	10	10
^A statistically significant association with other alternative therapies (p<0.05)														

A comparison of women's visits to GPs, specialists and allied health care professionals alongside self-prescribed CAM for back pain is presented in Table 5.2. Women were more likely to use herbal medicines, vitamins/minerals, supplements and aromatherapy oils if they consulted a GP for their back pain ($p<0.05$). Meanwhile, those women who consulted with an orthopaedic surgeon or rheumatologist for their back pain were more likely to use herbal medicines, vitamins/minerals, supplements, yoga/meditation or aromatherapy oils compared to women who did not consult with an orthopaedic surgeon or rheumatologist for their back pain ($p<0.05$). Women who consulted a neurologist for their back pain were more likely to take supplements compared to women who did not consult with a neurologist ($p<0.05$). Women who consulted a physiotherapist were more likely to practice yoga/meditation or take vitamins/minerals or supplements than women who did not consult with a physiotherapist for back pain care ($p<0.05$). Women who consulted an occupational therapist for back pain were more likely to practice yoga/meditation than women who did not consult with an occupational therapist ($p<0.05$). Women who consulted a nurse ($p<0.05$) were more likely to take vitamins/minerals, practice yoga/meditation or use aromatherapy oils than women who did not consult a nurse for back pain ($p<0.05$). Women who consulted a pharmacist for their back pain were more likely to use herbal medicines, vitamins/minerals, supplements or aromatherapy oils than women who did not consult with a pharmacist ($p<0.05$).

Table 5.2 The association between women's self-prescribed CAM treatments for back pain and health service utilisation

Health Service Utilisation	Herbal medicines		Vitamins/ Minerals		Supplements		Yoga/Meditation		Aromatherapy oils		Other Alt. Therapies		Total Self-prescriptions	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	n=172	n=1138	n=592	n=718	n=776	n=534	n=187	n=1123	n=112	n=1198	n=329	n=981	n=985	n=325
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
GP ^{ABCEF}														
Never	21	47	35	51	38	52	42	44	31	45	44	44	39	58
1 or 2 times	29	24	26	24	27	22	23	25	28	25	24	25	27	19
More than 3 times	50	29	39	25	35	26	35	31	41	30	32	31	34	23
Ortho. Surgeon ^{ABCDEF}														
Never	85	93	90	94	90	94	89	92	85	92	94	92	91	96
1 or 2 times	11	5	7	5	8	4	7	6	12	6	5	6	7	3
More than 3 times	4	2	3	1	2	2	4	2	3	2	1	2	2	1
Neurologist ^{CF}														
Never	94	96	94	97	95	97	94	96	95	96	98	96	95	98
1 or 2 times	4	3	4	2	4	2	5	3	3	3	2	3	4	1
More than 3 times	2	1	2	1	1	1	1	1	2	1	0	1	1	1
Rheumatologist ^{ABCDEF}														
Never	89	94	91	96	92	96	90	94	88	94	92	94	92	97
1 or 2 times	8	4	6	2	5	2	8	4	8	4	4	4	5	2
More than 3 times	3	2	3	2	3	2	2	2	4	2	4	2	3	1

Physiotherapist ^{B C D F}														
Never	56	64	60	65	59	68	52	65	57	63	62	63	60	70
1 or 2 times	15	13	12	14	14	11	18	12	17	13	10	13	14	12
More than 3 times	29	23	28	21	27	21	30	23	26	24	28	24	26	18
Occup. Therapist ^{B D}														
Never	96	97	96	98	97	98	94	98	94	97	99	97	97	98
1 or 2 times	3	1	2	1	2	1	3	1	3	2	1	2	2	0
More than 3 times	1	2	2	1	1	1	3	1	3	1	0	1	1	2
Nurse ^{B D E F}														
Never	94	97	95	98	96	97	93	97	90	97	96	96	96	98
1 or 2 times	3	1	2	1	2	1	5	1	6	1	2	2	2	0
More than 3 times	3	2	3	1	2	2	2	2	4	2	2	2	2	2
Pharmacist ^{A B C E F}														
Never	58	81	68	86	73	86	72	79	57	80	77	78	74	91
1 or 2 times	16	9	13	7	12	7	13	9	15	9	8	10	12	4
More than 3 times	26	10	19	7	15	7	15	12	28	11	15	12	14	5

^A statistically significant association with herbal medicines ($p < 0.05$)

^B statistically significant association with vitamins/minerals ($p < 0.05$)

^C statistically significant association with supplements ($p < 0.05$)

^D statistically significant association with yoga/meditation ($p < 0.05$)

^E statistically significant association with aromatherapy oils ($p < 0.05$)

^F statistically significant association with total self-prescribed therapies ($p < 0.05$)

Table 5.3 shows the results of the multiple logistic regression modelling, identifying the factors associated with self-prescribed treatments for back pain. Women were 2.33 (95% CI: 1.46, 3.68) times more likely to use herbal medicines if they consulted a GP once or twice in the previous twelve months compared to women who did not consult a GP and women were 2.92 (95% CI: 1.87, 4.54) times more likely to have used herbal medicines if they consulted a GP more than three times in the previous twelve months compared to women who did not see a GP. Women were 1.40 (95% CI: 1.05, 1.85) times more likely to take vitamins/minerals if they consulted a GP once or twice in the previous twelve months compared to women who did not consult a GP and 1.64 (95% CI: 1.24, 2.16) times more likely to use vitamins/minerals if they consulted a GP three or more times in the previous twelve months compared to women who did not see a GP. Women were 1.62 (95% CI: 1.22, 2.15) times more likely to use supplements if they consulted a GP once or twice in the previous twelve months compared to women who did not consult a GP and women were 1.54 (95% CI: 1.16, 2.03) times more likely to use supplements if they consulted a GP three or more times in the previous twelve months compared to women who did not see a GP. Women were 1.83 (95% CI: 1.18, 2.83) times more likely to practice yoga/meditation for back pain if they had seen a physiotherapist once or twice in the previous twelve months compared to women who did not consult a physiotherapist and women were 1.58 (95% CI: 1.09, 2.27) times more likely to practice yoga/meditation for back pain if they consulted a physiotherapist three or more times in the previous twelve months than women who did not see a physiotherapist.

Women who consulted a nurse in the previous 12 months were 5.70 (95% CI: 2.25, 14.92) times more likely to practice yoga/meditation for back pain compared to women who did not see a nurse and women were 4.35 (95% CI: 1.58, 11.96) times more likely to use aromatherapy oils for back pain than women who did not consult a nurse. Women who consulted a pharmacist once or twice in the previous twelve months were 2.28 (95% CI: 1.55, 3.33) times more likely to use vitamins/minerals, 2.19 (95% CI: 1.35, 3.52) times more likely to use herbal medicines, 2.16 (95% CI: 1.21, 3.84) times more likely to use aromatherapy oils and 1.82 (95% CI: 1.2, 2.72) times more likely to use supplements than women who did not visit a pharmacist. Similarly, women who consulted a pharmacist three or more times in the previous twelve months were 3.27 (95% CI: 1.99, 5.37) times more likely to use aromatherapy

oils, 2.71 (95% CI: 1.85, 3.95) times more likely to use vitamins/minerals, 2.42 (95% CI: 1.56, 3.72) times more likely to use herbal medicines, and 2.0 (95% CI: 1.33, 2.98) times more likely to use supplements than women who did not visit a pharmacist.

Table 5.3 Factors associated with women's use of self-prescribed CAM treatments for back pain

Factors	Herbal Medicines		Vitamins/ Minerals		Supplements		Yoga/Meditation		Aromatherapy oils		Total Self- prescriptions	
	OR 95% CI	p-value	OR 95% CI	p-value	OR 95% CI	p-value	OR 95% CI	p-value	OR 95% CI	p-value	OR 95% CI	p-value
GP Use												
Never	-	-	-	-	-	-					-	-
1 or 2 times	2.33	<0.001	1.4	0.019	1.62	0.001					1.86	<0.001
More than 3 times	2.92	<0.001	1.64	0.001	1.54	0.002					1.59	0.006
Rheumatologist												
Never											-	-
1 or 2 times											2.04	0.110
More than 3 times												
Physiotherapist												
Never							-	-				
1 or 2 times							1.83	0.006				
3 or more times							1.58	0.013				
Nurse												
Never							-	-	-	-		
1 or 2 times							5.70	<0.001	4.35	0.004		
More than 3 times							0.64	0.47	0.95	0.93		
Pharmacist												
Never	-	-	-	-	-	-			-	-	-	-
1 or 2 times	2.19	0.001	2.28	<0.001	1.82	0.004			2.16	0.009	3.25	<0.001
More than 3 times	2.42	<0.001	2.71	<0.001	2.00	0.001			3.27	<0.001	2.90	<0.001

Overall, the use of self-prescribed CAM for back pain by women was 1.86 (95% CI: 1.33, 2.6) times more likely if they consulted a GP once or twice in the previous twelve months and 1.59 (95% CI: 1.14, 2.22) times more likely if they consulted a GP more than three times in the previous twelve months. Women self-prescribing CAM were 3.25 (95% CI: 1.79, 5.9) times more likely to do so if they consulted a pharmacist once or twice in the previous twelve months and 2.90 (95% CI: 1.66, 5.09) times more likely to self-prescribe CAM if they consulted a pharmacist three or more times in the previous twelve months compared to women who did not consult a pharmacist.

5.6 Discussion

The results of our study suggest that a sizable majority of Australian women aged 60-65 years with back pain self-prescribe CAM. Such a high prevalence of self-prescribed CAM use confirms the popularity of CAM use as indicated in previous studies (Sibbritt, D. W. & Adams, J., 2010; Wade et al., 2008). It is interesting that previous research focusing upon broader CAM consumption (beyond people with just back pain) has indicated a more extensive use of CAM amongst women with a higher educational level, higher income and urban residence (Broom et al., 2012a; Ong, C. K. et al., 2004; Sibbritt, D. W., & Adams, J., 2010), while these factors did not determine women's use of self-prescribed CAM in our analysis. Our study reveals a high use of supplements and significant use of herbal medicines, vitamins/minerals, aromatherapy oils for back pain, which compares favourably with previous research reporting women's use of self-prescribed CAM more generally (Wade et al., 2008). Further research is needed to determine the factors influencing women's decision making on self-prescribed CAM use for back pain.

Women's health care utilisation alongside self-prescribed CAM treatments for back pain as identified in our study raises important issues regarding back pain sufferers' health seeking behaviour. We are unable to establish from our data whether women self-prescribe CAM treatments concurrently to seeking care from health care practitioners (conventional medical and CAM practitioners) necessitating future

research to explore this issue. In addition, further research is needed, as we do not know if women in our study disclosed their use of self-prescribed CAM to their conventional medical practitioners. Previous studies on general use of CAM (Marsh et al., 2009; Robinson & McGrail, 2004; Sleath et al., 2008) suggest that the concurrent use of multiple treatments is a common occurrence amongst patients suffering from pain and there is significant non-disclosure of CAM use to conventional medical practitioners by patients (Rao et al., 1999).

Our analysis shows that women who consulted a physiotherapist or a nurse frequently in the previous twelve months practiced yoga/meditation for back pain. This finding augments results from previous studies, which reported that physiotherapists (Hughes, C. et al., 2011) considered yoga as effective for back pain and nurses generally hold a positive attitude towards yoga (Shorofi & Arbon, 2010). Similarly, our study shows that women frequently consulting a nurse are higher users of aromatherapy oils for their back pain and this may reflect nurses' positive attitude towards use of aromatherapy oils, as identified in previous research (Shorofi & Arbon, 2010). Investigation detailing allied health care practitioners' attitudes towards patients' use of self-prescribed CAM for back pain is sparse, and further research is necessary to examine the perceptions of and approach to self-prescribed CAM treatments for back pain amongst this provider group.

Our analysis reveals that frequent visits to a GP are associated with higher use of herbal medicines, vitamins and supplements by women suffering from back pain. However, previous studies report a lack of trust in CAM amongst GPs due to concerns around safety, efficacy and drug interactions (Cohen, M M et al., 2005). Our analysis does not afford us the opportunity to examine if GPs are instrumental in the CAM use amongst these women. However, it may be that women self-prescribing CAM for back pain do so regardless of GPs advice or without even communicating to their GPs about their CAM use. There is a need for further research to explore communication between women and their GPs about self-prescribed CAM use.

Our analysis shows that women who visit a pharmacist frequently are also higher users of vitamins/minerals, herbal medicines, aromatherapy oils, and supplements. This finding complements previous research, which has identified substantial support for CAM amongst pharmacists in line with increasing stock of self-prescribed CAM

products in pharmacies (Kanjanaarach, T et al., 2011; Naidu et al., 2005). It is not possible for our study to determine if the advice by pharmacists influenced women in choosing self-prescribed CAM treatments. The specific role of pharmacists in relation to self-prescribed CAM for back pain is an issue that requires further research attention.

The interpretation of our study findings is limited due to the use of self-prescribed CAM treatments for back pain being self-reported and therefore the results may be potentially affected by recall bias. Despite this the ALSWH is a respected source of data for epidemiological research in Australia, and these limitations are countered by the insights provided from the first analysis of back pain sufferers' self-prescribed CAM use for back pain amongst a nationally representative sample.

5.7 Conclusions

Given the high use of self-prescribed CAM for back pain by Australian women aged 60 to 65 years identified in our study, it is important that all providers treating back pain (including conventional medical, allied health care and CAM practitioners) remain informed about the likelihood of self-prescribed CAM treatment use amongst their patients. This is an important issue especially considering the potential drug interactions and the danger of inappropriate treatment choices due to self-prescription. There is a need to examine patients' disclosure of self-prescribed CAM in their communication with their healthcare providers.

5.8 Chapter summary

The results reported in this study reveal a substantial use of self-prescribed CAM treatments by women with back pain irrespective of their socio-demographic status. Such high prevalence of self-prescribed CAM may indicate that women choose and use multiple treatments for their back pain care. The study results also showed definitive differences in the choices of self-prescribed CAM associated with frequency of visits to care providers across conventional medical and allied health care

professionals. It is not possible to draw a causal relationship between women's decision to use or not use certain self-prescribed CAM treatments and women's visits to specific back pain care providers due the fact that the analysis in this chapter is from an observational study. It is not possible to infer if back pain care providers encourage or discourage women's decisions on the choice of self-prescribed CAM. Therefore, future research would need to focus on the role of conventional medical and allied health care providers in patients' decision making on self-prescribing CAM treatments for back pain.

Besides, the study findings suggest a need to investigate the factors influencing women's decision making on self-prescribing CAM treatments for back pain including women's attitudes toward CAM and influential information sources. Also, as it is not possible from this study to determine if women self-prescribing CAM treatments were in communication with their GPs, allied health professionals and/or CAM practitioner prior to and/or after self-prescribing CAM, it is necessary to examine women's communication about their self-prescribed CAM with back pain care providers. These aspects will be addressed in Chapter 7.

6 Back pain sufferers' attitudes toward consultations with complementary and alternative medicine (CAM) practitioners and self-prescribed CAM products

6.1 Chapter introduction

Chapters 4 and 5 of this thesis identified high rates of prevalence for both CAM practitioner consultations and self-prescribed CAM treatments by back pain sufferers. These previous chapters also identified certain CAM practitioner groups and self-prescribed CAM treatments as popular amongst back pain sufferers. Beyond these descriptions of prevalence and commonly used CAM practitioner groups and self-prescribed CAM treatments, it is important within the scope of HSR to examine the drivers for such CAM use by back pain sufferers. While the previous chapters revealed that socio-economic factors did not play a role in determining CAM use, it is important to examine whether specific attitudes toward CAM influence back pain sufferers' decision-making with regard to CAM practitioner consultations and self-prescribed CAM products. This chapter attempts to provide insights into the role of back pain sufferers' attitudes and the influence they may have on decision-making with regard to CAM practitioner consultations and/or self-prescribed CAM product use. In doing so, it addresses the Research Question 4 (see Chapter 1, Sections 1.3.2, 4.a & 1.3.2, 4b).

6.1.1 Variable categorisation and statistical analysis

The demographic characteristics were categorised as described in Chapter 4 (Section 4.1.1) and Chapter 5 (Section 5.2). CAM practitioner consultations variables (i.e. massage therapist, chiropractor and acupuncturist) were the same variables as described in Chapter 4 (Section 4.1.1). Self-prescribed CAM variable (i.e. herbal medicines, vitamins/minerals and supplements) were the same variables as

described in Chapter 5 (Section 5.2). A decision to examine in detail women's attitudes toward CAM in relation to those who consulted a massage therapist, chiropractor and/or acupuncturist was made based on the fact that these three CAM practitioner groups were more commonly consulted by the participants in this study than other CAM practitioner groups. Similarly, back pain sufferers' attitudes toward CAM in relation to those who self-prescribed herbal medicines, vitamins/minerals and/or supplements were considered for detailed analysis as these self-prescribed CAM products were more frequently used by women than aromatherapy oils, Chinese medicine or 'other alternative therapies'.

Besides the analysis of basic demographic characteristics, private health insurance coverage for consultations with chiropractor, acupuncturist, massage therapist and self-prescribed alternative medicine was also analysed, based on responses to Questions 38c, 38d, 38g and 38i of the sub-study questionnaire. A decision to include the variables on availability of private health insurance for the above mentioned CAM was made in order to account for 'health insurance' as a confounder in analysing associations between women's attitudes and their use of CAM.

Women's attitudes toward CAM was analysed from responses to Questions 35a, 35c, 35e, 35f, 35g, 35h, 35i, 35j, 35l, 35m, 35n, 35o and 35p of the sub-study survey. The data on women's attitudes toward CAM was presented as descriptive data. Further, attitudes about CAM held by women who consulted a massage therapist, a chiropractor, an acupuncturist and women who self-prescribed herbal medicines, vitamins/minerals or supplements were analysed by applying Student's *t*-test or Wilcoxon rank-sum test where appropriate. Bonferroni correction was used to adjust for multiple comparisons. Multiple logistic regression was employed for the main analyses presented in this chapter. Variables relating to demographic characteristics (i.e. spending ability, highest educational qualification, urban/rural residence), health insurance coverage and all attitudes toward CAM were included into the model for analysing women's consultations with respective CAM practitioners (i.e. massage therapist, acupuncturist, chiropractor). Similarly, logistic regression was employed to determine significant determinants for self-prescribing CAM products (i.e. herbal medicines, vitamins/minerals, supplements) by including all dependent variables and confounders (i.e. levels of education, area of residence, spending ability, private health insurance) and all attitudes toward CAM forming the independent variables.

For analysing both CAM consultations and self-prescribed CAM products, a backward stepwise elimination process was employed using a likelihood ratio test, to eventually establish the most parsimonious model.

The results contained within this chapter have been published as follows:

Murthy V, Sibbritt D, Broom A, Kirby E, Frawely J, Refshauge KM, Adams J. Back pain sufferers' attitudes towards consultations with CAM practitioners and self-prescribed CAM products: A study of a nationally representative sample of 1310 Australian women aged 60-65 years. *Complementary Therapies in Medicine* 2015; 23(6): 782-788.

A copy of the manuscript is attached to this thesis as Appendix 7.

6.2 Introduction

Complementary and alternative medicine (CAM) encompasses practices and products generally considered to be extrinsic to the dominant conventional medical system (Adams, J, Easthope, J G, et al., 2003; Adams, Sibbritt, et al., 2011; Steel et al., 2012). The various CAM modalities have vastly different perspectives and approaches to treating conditions (Chez & Jonas, 1997). Nevertheless, CAM use can be categorised as either 'practitioner based' (e.g. acupuncture) or 'product based' (e.g. vitamins) (Broom et al., 2012a; Palinkas & Kabongo, 2000; Wade et al., 2008). Prevalence of CAM practitioner consultations and CAM product use has continued to increase in developed countries (Adams, Sibbritt & Young, 2009; Barnes, Patricia M et al., 2007; Smith, John Sullivan & David Baxter, 2011) with a distinct popularity of CAM use amongst women (Adams, J, Easthope, J G, et al., 2003; Hanssen et al., 2005; Kirby, Broom, Sibbritt, Refshauge, et al., 2013; Wade et al., 2008) along with those who have higher levels of education, higher income and who reside in urban areas (Broom et al., 2012a; Sibbritt, D. W., & Adams, J., 2010). With regard to back pain, concurrent CAM use appears common (Kirby, Broom, Sibbritt, Adams, et al., 2013; Murthy et al., 2014a; Wolsko et al., 2003), where success of treatment by conventional medical care is unclear (Nachemson et al., 2000; van Tulder, M. et al.,

2000). Back pain is reported more by women than men and health care utilisation is generally higher amongst women than men with back pain (Haetzman et al., 2003; Kent & Keating, 2005; Millar, 2001; Walker, B. F. et al., 2004a; Webb et al., 2003). In the year 2010, 76% of Australian women aged 60-65 years consulted a CAM practitioner (Murthy et al., 2014a) and 75% used self-prescribed CAM treatments (Murthy et al., 2014b) for their back pain. Previous literature shows widespread use of CAM for back pain. Consultations with an acupuncturist, a chiropractor or massage therapist for back pain are common across Canada, Australia, Germany, UK and the US (Chenot et al., 2007; Côté et al., 2001; Kanodia et al., 2010; Murthy et al., 2014a; Ong, C. K. et al., 2004). Similarly, substantial use of herbal medicines, vitamins/minerals and/or supplements by back pain sufferers has been reported internationally (Broom et al., 2012a; Gaul et al., 2011; Murthy et al., 2014b; Wade et al., 2008).

Studies of general CAM use report personal beliefs (Wade et al., 2008), a preference for what patients perceive to be 'natural' approaches to treatment (Shmueli, A et al., 2011), a desire to avoid adverse effects of drugs (Palinkas & Kabongo, 2000), and a preference for self-care (Millar, 2001) as important factors influencing decision-making on CAM use. Research on CAM use for back pain has identified factors such as dissatisfaction with conventional medical treatments, long waiting periods for appointments with general practitioners (GPs) and a lack of access to conventional medical care as some of the reasons why back pain sufferers explore CAM treatments (Broom et al., 2012b; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013). An Australian study found that self-perceived benefits of CAM and the approachability of CAM practitioners were also important reasons for back pain sufferers to use CAM (Kirby, Broom, Sibbritt, Adams, et al., 2013). Although chiropractic and acupuncture users internationally have reported the role of these modalities in supporting wellbeing as an important influencing factor in their decision making, it is not known if such attitudes also influence back pain sufferers' choice of chiropractic or acupuncture use in the treatment of back pain (Ailliet et al., 2010; Coulter et al., 2002; Hartvigsen et al., 2002; McGrady & Betz, 2008; Xue, C., C L et al., 2008). Unfortunately, the role of patients' attitudes and their influence upon back pain sufferers' decision-making with direct regard to CAM practitioner consultations and/or self-prescribed CAM product use remains under-researched. In response to

this gap, this paper reports findings drawn from a nationally representative sample of Australian women focusing on the influence of patients' attitudes upon their decision to consult CAM practitioners and/or self-prescribe CAM products for back pain.

6.3 Methods

6.3.1 Sample

Participants were recruited from a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH was designed to investigate multiple factors affecting the health and well-being of women over a 20-year period starting from 1996. Women in three age groups (18-23 years [young cohort], 45-50 years [mid-age cohort] and 70-75 years [older cohort]) were randomly selected from the national Medicare database. These participants have been shown to be broadly representative of the national population of women in the target age group in the baseline survey (conducted in 1996) (Brown, W. J. et al., 1999). The participants for the sub-study reported here were chosen from the mid-age cohort of women, who had indicated in the sixth ALSWH survey (2010) that they had experienced back pain. Of the 10,011 women who responded to the sixth ALSWH survey, 1,851 indicated having experienced back pain and these women were mailed a 50-item sub-study questionnaire. Of those, 1,620 were deemed eligible (confirming that they did have back pain) and 1,310 (80.9%) women returned the completed questionnaire. Relevant ethical approval was gained from the Human Ethics Committee at the University of Queensland, University of Newcastle and University of Technology Sydney, Australia.

6.3.2 Back pain sufferers' attitudes toward the use of complementary and alternative medicine

Study participants were asked about their attitudes toward both CAM practitioner use and self-prescribed CAM use for their back pain. The women were asked to indicate their level of agreement or disagreement (i.e. strongly agree, agree, neutral, disagree, strongly disagree) with the following statements: CAM is more natural than

conventional medicine; CAM has fewer side effects than conventional medicine; CAM promotes a holistic approach to health; CAM gives more control over health/body; knowledge about evidence of CAM is important to me as a patient; clinical evidence is important in my choice of CAM; my personal experience of the effectiveness of CAM is more important than clinical evidence; CAM needs to be tested for safety/side effects. In addition to these statements, back pain sufferers who had consulted CAM practitioners were asked to indicate their level of agreement or disagreement (i.e. strongly agree, agree, neutral, disagree, strongly disagree) with the following statements: CAM practitioners spend a longer time with me in consultations when compared with my doctor; CAM practitioners provide more support to me than my doctor does; I find it easier to talk to a CAM practitioner than to a doctor; I have more equal relationship with a CAM practitioner than with doctors; doctors should be able to advise their patients about commonly used CAM for back pain.

6.3.3 Demographic characteristics

Postcodes were utilised to classify a woman's area of residence as urban or non-urban. Women were asked if they had or did not have private health insurance. If the women reported private health insurance cover, they were further asked if such insurance covered consultations with massage therapists, chiropractors and/or acupuncturists. The women were also asked about their highest educational qualifications completed and their ability to manage on their available income.

6.3.4 Consultations with CAM practitioners

Women were asked whether or not they had consulted a massage therapist, a chiropractor and/or an acupuncturist for their back pain in the previous twelve months.

6.3.5 Self-prescribed CAM products for back pain

Women were asked whether or not they had self-prescribed herbal medicines, vitamins/minerals and/or supplements for their back pain in the previous twelve months.

6.4 Statistical analysis

Attitudes about CAM held by those women who consulted a massage therapist, a chiropractor, an acupuncturist and those who self-prescribed herbal medicines, vitamins/minerals or supplements for their back pain were investigated using Student's t-test (with mean and standard deviation reported) or Wilcoxon rank-sum test where appropriate. Bonferroni correction was used to adjust for multiple comparisons. Logistic regression models were employed to determine significant predictors of CAM use (i.e. dependent variables), by entering all attitudes toward CAM into the models (i.e. independent variables). In addition, levels of education, area of residence (urban or rural), income and private health insurance status were included in the model as confounders. A backward stepwise elimination process was employed using a likelihood ratio test, to eventually establish the most parsimonious model. Statistical significance was set at $p < 0.05$. All analyses were conducted using statistical software STATA 11.2.

6.5 Results

Of the 1,310 women who answered and returned the questionnaire (a response rate of 80.9%), 41.4% (n=578) had consulted a massage therapist, 37.3% (n=488) had consulted a chiropractor, 13.3% (n=174) had consulted an acupuncturist, 59.2% (n=776) had self-prescribed supplements, 45.2% (n=592) had self-prescribed vitamins/minerals and 13.1% (n=172) had self-prescribed herbal medicines in the previous twelve months for their back pain.

From those who responded to questions on demographic characteristics, 90% (n=1,171) lived in urban areas and 10% (n=126) in non-urban areas. In terms of level of education attained, 10% (n=125) reported having no formal education, 40% (n=494) had high school education, 21% (n= 264) had a trade diploma and 29% (n=360) had university education. The majority of women (75%, n=969) were married or in a de-facto relationship, while 21% (n=279) were separated, divorced or widowed and 4% (n=49) were "never married". In terms of income, 12% (n=153) reported difficulty to manage from available income, 22% (n=292) reported "difficult sometimes", 45% (n=583) had mentioned "not too bad" and 21% (n=272) had

reported “easy to manage”. With regard to private health insurance, 49% (n=638) of the women said that their insurer offered rebates for chiropractic care, 29% (n=381) for acupuncturist care, 28% (n=378) for massage therapy and 24% (n=319) for self-prescribed CAM treatments.

Table 6.1 reports the attitudes of women towards use of CAM for back pain. Most (85%) agreed that doctors should be able to advise their patients about CAM for back pain, 82% agreed that CAM needs to be tested for safety/side effects, 69% agreed that clinical evidence is important for their choice of CAM, 65% agreed that knowledge about evidence of CAM is important for them as a patient and 51% agreed that CAM has fewer side effects than conventional medicine. Conversely, only 20% of the women agreed that they find it easier to talk to a CAM practitioner than a doctor, 23% agreed that they have more equal relationship with CAM practitioners than with doctors and 28% agreed that CAM practitioners provide more support to them than their doctors.

Table 6.1 Attitude of women towards use of complementary and alternative medicine (CAM) for back pain

Attitudes towards CAM	Number of responses from 1,310 women	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
CAM is more natural than conventional medicine	1,278	11	30	46	10	3
CAM has fewer side effects than conventional medicine	1,282	13	38	38	9	2
CAM promotes a holistic approach to health	1,264	11	36	44	7	2
CAM gives me more control over my health/body	1,272	10	32	44	12	2
CAM practitioners spend a longer time with me in consultations when compared with my doctor	1,269	13	30	38	16	3
CAM practitioners provide more support to me than my doctor does	1,268	9	18	41	26	6
I find it easier to talk to a CAM practitioner than to a doctor	1,269	7	13	42	31	7
I have more equal relationship with CAM practitioners than with doctors	1,266	7	16	40	30	7
Knowledge about evidence of CAM is important to me as a patient	1,262	14	51	29	4	2
Doctors should be able to advise their patients about commonly used CAM for back pain	1,273	23	62	12	2	1
Clinical evidence is important in my choice of CAM	1,263	16	53	27	3	1
My personal experience of the effectiveness of CAM is more important than clinical evidence	1,265	13	32	38	14	3
CAM needs to be tested for safety/side effects	1,279	31	50	15	3	1

Table 6.2 presents the difference in means between women who had consulted and those who had not consulted a CAM practitioner (i.e. massage therapist, chiropractor, acupuncturist). For all of the following statements, those who consulted with the CAM practitioner in question were more likely to agree (i.e. a higher mean score) than those who did not consult with the CAM practitioner: CAM is more natural than conventional medicine; CAM has fewer side effects than conventional medicine; CAM promotes a holistic approach to health; CAM provides more control over my health/body; CAM practitioners spend a longer time with me in consultations when compared with my doctor; CAM practitioners provide more support to me than my doctor does; I find it easier to talk to a CAM practitioner than a doctor; knowledge about evidence of CAM is important to me as a patient; my personal experience of the effectiveness of CAM is more important than clinical evidence (all $p < 0.004$). The statement that CAM needs to be tested for safety/side effects showed significant difference ($p < 0.004$); where women who had consulted a chiropractor or an acupuncturist had a higher mean score than women who did not consult a chiropractor or an acupuncturist.

Table 6.2 Comparison of attitudes between those who consulted and those who did not consult complementary and alternative medicine (CAM) practitioners for back pain

Attitudes	CAM practitioners					
	Massage therapist		Chiropractor		Acupuncturist	
	Yes	No	Yes	No	Yes	No
(Scored: 2 = 'strongly agree', 1 = 'agree', 0 = 'neutral', -1 = 'disagree', -2 = 'strongly disagree')	(n=578)	(n=732)	(n=488)	(n=822)	(n=174)	(n=1,136)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
CAM is more natural than conventional medicine ^{ABC}	0.46 (0.87)	0.21 (0.89)	0.57 (0.87)	0.18 (0.90)	0.54 (0.88)	0.25 (0.90)
CAM has fewer side effects than conventional medicine ^{ABC}	0.60 (0.88)	0.34 (0.87)	0.70 (0.85)	0.31 (0.90)	0.74 (0.82)	0.40 (0.89)
CAM promotes a holistic approach to health ^{ABC}	0.60 (0.83)	0.28 (0.83)	0.67 (0.80)	0.28 (0.87)	0.65 (0.82)	0.38 (0.86)
CAM provides more control over my health/body ^{ABC}	0.48 (0.86)	0.12 (0.86)	0.62 (0.82)	0.10 (0.88)	0.53 (0.92)	0.23 (0.88)
CAM practitioners spend a longer time with me in consultations when compared with my doctor ^{ABC}	0.52 (1.01)	0.08 (0.91)	0.50 (1.0)	0.17 (0.93)	0.69 (1.07)	0.18 (0.93)
CAM practitioners provide more support to me than my doctor does ^{ABC}	0.11 (1.06)	-0.20 (0.91)	0.17 (1.04)	-0.19 (0.94)	0.16 (1.15)	-0.15 (0.94)
I find it easier to talk to a CAM practitioner than to a doctor ^{ABC}	-0.04 (1.04)	-0.33 (0.88)	-0.01 (1.01)-)	-0.31 (0.93)	-0.09 (1.15)	-0.27 (0.91)
I have a more equal relationship with CAM practitioner than with doctors ^{AB}	-0.01 (1.06)	-0.29 (0.93)	0.02 (1.04)	-0.29 (0.95)	-0.03 (1.15)	-0.24 (0.95)
Knowledge about evidence of CAM is important to me as a patient ^{ABC}	0.85 (0.74)	0.55 (0.86)	0.86 (0.70)	0.57 (0.89)	0.88 (0.69)	0.63 (0.85)

Doctors should be able to advise their patients about commonly used CAM for back pain ^{AB}	1.10 (0.69)	0.94 (0.77)	1.16 (0.68)	0.93 (0.77)	1.14 (0.72)	0.99 (0.75)
Clinical evidence is important in my choice of CAM	0.82 (0.72)	0.75 (0.81)	0.82 (0.71)	0.76 (0.81)	0.83 (0.76)	0.77 (0.79)
My personal experience of the effectiveness of CAM is more important than clinical evidence ^{ABC}	0.47 (0.94)	0.18 (0.96)	0.53 (0.94)	0.18 (0.97)	0.69 (0.91)	0.24 (0.96)
CAM needs to be tested for safety/side effects ^B	1.07 (0.75)	1.14 (0.08)	1.01 (0.78)	1.16 (0.78)	0.96 (0.86)	1.12 (0.78)

^A statistically significant association with Massage therapist (p<0.005)

^B statistically significant association with Chiropractor (p<0.005)

^C statistically significant association with Acupuncturist (p<0.005)

Table 6.3 shows the difference in means between women who had self-prescribed CAM treatment and those who had not self-prescribed CAM treatment for their back pain (i.e. Herbal medicines, Vitamins/Minerals, Supplements). For all of the following statements, those who had self-prescribed CAM treatment in question were more likely to agree (i.e. a higher mean score) than those who did not self-prescribe CAM treatment: CAM is more natural than conventional medicine; CAM has fewer side effects than conventional medicine; CAM promotes a holistic approach to health; CAM provides more control over my health/body; knowledge about evidence of CAM is important to me as a patient (all $p < 0.005$). The statement, clinical evidence is important in my choice of CAM showed significant difference ($p < 0.005$); where women who had self-prescribed vitamins/minerals had a higher mean score than women who had not self-prescribed vitamins/minerals.

Table 6.3 Comparison of attitudes between those who self-prescribed and those who did not self-prescribe complementary and alternative

Attitudes	Self-prescribed CAM treatment					
	Herbal medicines		Vitamins/Minerals		Supplements	
	Yes (n=172)	No (n=1,138)	Yes (n=592)	No (n=718)	Yes (n=776)	No (n=534)
(Scored: 2 = 'strongly agree', 1 = 'agree', 0 = 'neutral', -1 = 'disagree', -2 = 'strongly disagree')	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
CAM is more natural than conventional medicine ^{ABC}	0.59 (0.91)	0.26 (0.89)	0.54 (0.91)	0.15 (0.86)	0.45 (0.89)	0.16 (0.89)
CAM has fewer side effects than conventional medicine ^{ABC}	0.73 (0.87)	0.40 (0.91)	0.63 (0.89)	0.34 (0.91)	0.61 (0.86)	0.24 (0.93)
CAM promotes a holistic approach to health ^{ABC}	0.78 (0.82)	0.39 (0.84)	0.65 (0.80)	0.29 (0.87)	0.56 (0.82)	0.30 (0.87)
CAM provides more control over my health/body ^{ABC}	0.58 (0.91)	0.25 (0.88)	0.54 (0.86)	0.13 (0.89)	0.47 (0.86)	0.08 (0.91)
Knowledge about evidence of CAM is important to me as a patient ^{ABC}	1.04 (0.66)	0.59 (0.84)	0.88 (0.74)	0.49 (0.85)	0.80 (0.76)	0.49 (0.89)
Clinical evidence is important in my choice of CAM	0.85 (0.80)	0.77 (0.79)	0.85 (0.79)	0.73 (0.77)	0.81 (0.76)	0.73 (0.82)
My personal experience of the effectiveness of CAM is more important than clinical evidence ^{BC}	0.46 (0.95)	0.29 (0.97)	0.51 (0.96)	0.22 (0.94)	0.43 (0.95)	0.21 (0.97)
CAM needs to be tested for safety/side effects	1.18 (0.77)	1.07 (0.80)	1.09 (0.77)	1.11 (0.80)	1.09 (0.77)	1.11 (0.82)

^A statistically significant association with Herbal medicines (p<0.005)

^B statistically significant association with Vitamins/Minerals (p<0.005)

^C statistically significant association with Supplements (p<0.005)

The logistic regression analysis (Table 6.4) demonstrated that women who agreed with the statement 'as a patient, I have more equal relationship with a CAM practitioner than doctors' were significantly less likely to consult an acupuncturist (OR=0.40; CI: 0.22, 0.72) ($p=0.003$) compared to those that disagreed. Women who agreed with the statement 'CAM gives me more control over my health/body' were 4.21 (95% CI: 2.16, 8.19) ($p<0.001$) times more likely to consult a chiropractor than those that disagreed.

Table 6.4 Women's attitude towards CAM practitioner consultations for back pain

Factors	Massage therapist (n=712)			Chiropractor (n=842)			Acupuncturist (n=801)		
	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value
CAM is more natural than conventional medicine Disagree Neutral Agree	- 2.34 1.60	- 1.29, 4.23 0.87, 2.95	- 0.005 0.128						
As a patient, I have more equal relationship with a CAM practitioner than doctors Disagree Neutral Agree	- 0.59 1.00	- 0.37, 0.92 0.60, 1.67	- 0.022 0.984				- 0.40 0.54	- 0.22, 0.72 0.29, 0.99	- 0.003 0.048
Clinical evidence is important in my choice of CAM Disagree Neutral Agree							- 6.80 4.09	- 1.45, 31.86 0.91, 18.26	- 0.015 0.065
CAM practitioners spend longer time with me in consultations when compared with my doctor Disagree Neutral Agree	- 0.69 1.39	- 0.39, 1.19 0.80, 2.41	- 0.187 0.238	- 0.51 0.68	- 0.31, 0.84 0.42, 1.10	- 0.009 0.119	- 0.56 1.44	- 0.26, 1.20 0.72, 2.89	- 0.140 0.299
CAM gives me more control over my health/body Disagree Neutral Agree				- 2.70 4.21	- 1.42, 5.12 2.16, 8.19	- 0.002 <0.001			

Table 6.5 shows the logistic regression modelling, identifying attitudes toward CAM associated with self-prescribed CAM product use for back pain. Women who agreed with the statement 'CAM is more natural than conventional medicine' were 1.56 (95% CI: 1.02, 2.37) times more likely to self-prescribe vitamins/minerals than those that disagreed with this statement ($p=0.036$). Women who agreed with the statement 'CAM promotes a holistic approach to health' were 2.73 (95% CI: 1.60, 4.64) times more likely to self-prescribe vitamins/minerals for their back pain than those that disagreed ($p<0.001$). Women who agreed with the statement 'knowledge about evidence of CAM is important for me as a patient' were 7.15 (95% CI: 1.72, 29.64) times more likely to self-prescribe herbal medicines than those who disagreed ($p=0.007$). Women who agreed with the statement 'CAM gives me more control over my health/body' were 2.38 (95% CI: 1.05, 3.49) times more likely to self-prescribe supplements than those that disagreed ($p=0.033$).

Table 6.5 Women's attitude towards self-prescribed complementary and alternative medicine (CAM) for back pain

Factors	Herbal medicines (n=1250)			Vitamins/minerals (n=1256)			Supplements (n=1262)		
	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value
CAM is more natural than conventional medicine Disagree Neutral Agree				- 1.00 1.56	- 0.67, 1.50 1.02, 2.37	- 0.978 0.036			
Knowledge about evidence of CAM is important to me as a patient Disagree Neutral Agree	- 2.99 7.15	- 0.69, 12.96 1.72, 29.64	- 0.142 0.007						
CAM needs to be tested for safety/side effects Disagree Neutral Agree							- 1.89 1.92	- 0.26, 1.20 0.72, 2.89	- 0.140 0.299
CAM gives me more control over my health/body Disagree Neutral Agree							- 1.64 2.38	- 0.97, 3.66 1.05, 3.49	- 0.059 0.033

6.6 Discussion

Drawing upon a nationally representative sample of female back pain sufferers aged 60-65 years, this paper reports the first examination of the influence of women's attitudes toward CAM upon their decisions regarding consulting a range of CAM practitioners and using a range of self-prescribed CAM products. Our analysis identifies three key findings. First, a common view amongst women who consulted CAM practitioners (i.e. chiropractors) and those who self-prescribed CAM products (i.e. supplements) was that CAM gives more control over their health/body. This finding appears to support previous research on CAM use amongst patients managing conditions such as cancer, menopause and other chronic illnesses which has reported patients' choice of CAM as related to their perceptions that CAM allows them more control over their health/body (Bishop, Felicity L et al., 2007; Boon et al., 2003; Richter et al., 2001). Back pain, due to its chronicity and subsequent ongoing impact on quality of life, can compel patients to seek treatment approaches that allow them to more actively participate in the management of their illness, thereby providing a sense of empowerment (Cartwright, 2007). Further to this, previous research on CAM use suggests that self-management of back pain is important for back pain sufferers (Kirby et al., 2014; Kirby, Broom, Sibbritt, Adams, et al., 2013). There is little information on whether and how different CAM modalities may or may not provide control over one's health/body in back pain care, therefore demanding further research. Our findings suggest that the need for control over health/body by back pain sufferers in their illness management requires further in-depth research attention to explore how different CAM modalities may provide a sense of control over the patient's health/body in back pain care and how such experience and perception may provide opportunity and challenge for the broader patient care of back pain sufferers.

Second, our study revealed that women's understandings of CAM as natural and as promoting a holistic approach to health were associated with their use of self-prescribed vitamins/minerals. This finding appears to support previous research, which has found that patients with chronic illnesses (beyond back pain) commonly choose non-pharmacological over-the-counter products with the intention to seek natural approaches to disease management (Bishop, Felicity L et al., 2007; Murthy et al., 2014b; Wade et al., 2008). The perception of self-prescribed CAM as natural has

often been promoted by popular health information sources (Tachjian, Maria & Jahangir, 2010). There is also evidence that self-prescribing CAM products is perceived by consumers as a way of supporting one's overall health (Bishop, Felicity L et al., 2007). Exercising individual choices and taking responsibility for one's own health beyond conventional medical care may imply a desire for a more holistic approach to health care. Research exploring the motivations of people aged 60 years and above who self-prescribed CAM products showed that these consumers perceived conventional medicine as lacking holism and that their practice of self-prescribing CAM products was linked to exploring ways of filling these perceived gaps in conventional medicine (Leontowitsch et al., 2010). Despite such beliefs in holism and/or natural approaches to health, combining self-prescribed CAM products with conventional medicines is a common occurrence amongst patients with chronic illnesses including back pain (Adams, J, Easthope, J G, et al., 2003; Murthy et al., 2014b). Given the possible safety issues around polypharmacy and the opportunity for consumers to purchase CAM products without adequate advice from qualified health professionals, the patients' notion of CAM treatments being 'natural and/or holistic' requires further research attention within the study of back pain patient behaviours and treatment choices.

Possessing knowledge of evidence about CAM was important to those women in our study who self-prescribed herbal medicines. Being inquisitive about evidence for CAM may be an essential aspect of self-prescribing herbal medicines, as the responsibility for product selection, dosage, duration of treatment and knowledge about side effects often falls upon the consumer (Eichhorn, Greten & Efferth, 2011). While previous research has shown that chronic illness patients using CAM take an active interest in seeking information about CAM from a variety of sources, - both lay and scientific (Bishop, Felicity L et al., 2007; Caspi, Koithan & Criddle, 2004) - the prospect remains that those women self-prescribing herbal medicines may be predominantly dependent upon manufacturers' information on safety and efficacy rather than the advice of a qualified health professional (Eichhorn et al., 2011). This is a potentially challenging situation exacerbated by the fact that previous research cautions against trusting the information on safety and efficacy of herbal medicines in lay media (Hesse et al., 2005) and that the emerging evidence on herbal medicine (Gagnier, J J et al., 2007) may not necessarily relate directly to consumer products due to the vast majority of efficacy studies focusing upon single herbs while over-the-counter herbal medicines

tend to be herbal combinations sold as dietary supplements (Bent & Ko, 2004). As such, self-prescribing herbal medicines may have serious implications for back pain sufferers, as these patients may be prone to experiment with potentially unsafe and/or ineffective treatments void of guidance from a qualified health professional, whether conventional or complementary. Future research must examine both the role and trustworthiness of lay media in influencing back pain sufferers' use of self-prescribed herbal products for back pain.

Drawing upon a nationally representative sample of female back pain sufferers and the excellent response rate achieved are strengths of our study. The study provides new insights into women's attitudes toward CAM and their association with the women's decision to use CAM for their back pain. The study provides new insights into women's attitudes toward CAM and their association with the women's decision to use CAM for their back pain. Our study has certain limitations. Interpretation of our findings is limited by the fact that the data is self-reported which may be affected by recall bias as well as social desirability bias. Also, we cannot generalise the findings to Australian women of other ages as our study population had a narrow age range (60 - 65 years) of back pain sufferers. Nevertheless, our study is the first to draw upon a large nationally-representative sample of women aged 60 - 65 years who suffer back pain to examine the relationship between women's attitudes toward CAM and their consultation with CAM practitioners and use of self-prescribed CAM products.

6.7 Conclusion

CAM use is prevalent among women with back pain and back pain care providers need to be aware of their patients' attitudes toward CAM and its impact on self-prescribed CAM use and practitioner-led CAM. Conventional care providers need to help guide their back pain patients toward making responsible and safe treatment choices regarding CAM use.

6.8 Chapter summary

The results from this chapter reveal that certain attitudes held by back pain sufferers toward CAM influence their decisions regarding consulting a range of CAM practitioner groups and self-prescribing a range of CAM products. Back pain sufferers' view that CAM gives more control over their health/body seems to be an important influencing factor for using CAM. This finding may explain the high rates of prevalence of CAM use amongst back pain sufferers as often back pain, due to its chronicity and negative impact on quality of life may spur a need for individual choices outside of conventional medical care. It is important for future research to examine if and how CAM treatments provide greater control over one's health/body and the impact such perception has on self-management and quality of life in back pain care.

The results in this chapter indicated that those who held the attitude that 'CAM is natural' were likely to self-prescribe certain CAM products (i.e. vitamins/minerals). Promotion of over-the-counter CAM products as natural by popular information sources may play a role in encouraging self-prescribing CAM. It is necessary for future research to examine whether the perception that CAM products are natural may lead the users to also believe that such products may be safe. Those who tended to agree that knowledge on evidence about CAM is important for them also were likely to self-prescribe herbal medicines. As self-prescribing herbal medicines require users' initiative to actively seek information on the products, an interest in knowledge on evidence can be expected. Given the questions around evidence for herbal medicines, it is important to understand whether back pain sufferers' seek knowledge on evidence from credible sources or whether lay sources of information influence back pain sufferer's treatment choices (some of these issues will be addressed in Chapter 7).

7 The influence of communication and information sources upon decision-making around complementary and alternative medicine use for back pain among Australian women aged 60 to 65 years

7.1 Chapter introduction

The previous chapters (Chapter 4,5 & 6) identified significant rates of CAM use by back pain sufferers and showed that certain attitudes toward CAM influenced women's decisions on choosing CAM for their back pain. While back pain sufferers' attitudes toward CAM can partly account for women's decisions to use CAM, it is important to examine the role of professional and non-professional information sources on women's decision making regarding CAM use. Further, considering high prevalence of CAM use for back pain as revealed by this study together with knowledge that back pain sufferers use CAM alongside conventional medicine, it is important to establish the degree of communication of women with back pain care providers and the possible influence it may have on back pain sufferers' decisions to choose or not choose CAM for back pain management. With this in mind, the chapter addresses the Research Question 5 (see Sections 1.3.2, 5a., 1.3.2, 5b & 1.3.2, 5c) and presents the findings on factors influencing decision-making on CAM use for back pain and back pain sufferers' communication about CAM use with back pain care providers.

7.2 Variable categorisation

The basic demographic data on women's marital status, highest educational qualification, income and area of residence was extracted, as described in Chapter 3 (Section 3.5.2). The data on prevalence of CAM practitioner consultations were extracted, as described in Chapter 4 (Section 4.1.1) and the prevalence of self-prescribed CAM were extracted, as described in Chapter 5 (Section 5.2).

Women's communication with GPs, pharmacists and/or CAM practitioners regarding CAM use was analysed by considering responses to Questions 21, Q22, Q24, Q25, Q29, Q30, Q32, Q33 and Q34 of the sub-study survey (See Appendix 2).

Influential information sources on women's decision-making regarding CAM use were determined through analysis of Question 20 of the sub-study survey (See Appendix 2). The responses to Question 20a, 20b, 20c, 20d, 20e, 20f, 20g, 20h, 20i and 20j were re-coded by collapsing the original 5 response options to 2 categories respectively: 'no influence' and 'of little influence' were combined to represent 'no influence', while the remaining 3 response options (i.e. moderately influential, influential, very influential) were combined to represent 'influence'.

Question 39 of the sub-study survey was analysed to determine women's consultations with CAM practitioner groups (i.e. chiropractor, acupuncturist, herbalist/naturopath, massage therapist, osteopath) for a range of back pain related concerns; headaches/migraines, neck pain, leg pain/sciatica, arm pain, pins and needles/numbness, stiffness, fatigue, weakness, sleeping problems (See Appendix 2). A decision was taken to only include response options for Question 39 pertaining to consultations with CAM practitioner groups as this study focuses on the influence of information sources on women's decisions to use CAM for back pain management. A decision was also taken to include the range of symptoms that are closely linked to back pain (i.e. headaches/migraines, neck pain, leg pain/sciatica, arm pain, pins and needles/numbness, stiffness, fatigue, weakness, sleeping problems) for the purpose of analysis. These items were presented as 'yes' or 'no' for each of the back pain related symptoms and women's consultations with any of the CAM practitioners. Such data allowed for bivariate analysis of establishing whether there was a statistical significance in women's choice of CAM practitioner consultation for back pain-related symptoms and the sources of information that influenced their decision-making. Further, these items were considered for logistic regression analysis for predicting women's consultations with CAM practitioners for back pain-related symptoms by employing a backward stepwise elimination process of establishing a likelihood ratio test, to eventually establish the most parsimonious model.

The results contained within this chapter have been published as follows:

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A copy of the manuscript is attached to this thesis as Appendix 8.

7.3 Introduction

In recent decades, there has been a substantial increase in the use of complementary and alternative medicine (CAM) (Barnes, P M et al., 2004; Broom et al., 2012a; Frass et al., 2012; Shmueli, A et al., 2011) - a set of practices and products widely used to support health and wellbeing but not usually considered to be part of the conventional medical system (Adams, J, Easthope, J G, et al., 2003; Adams, Sibbritt, et al., 2011). In particular, increasing prevalence of CAM for pain management has been reported across populations in developed countries (Broom et al., 2012a; Côté et al., 2001; Fautrel et al., 2002; Murthy et al., 2014a; Murthy et al., 2014b; Ong, C. K. et al., 2004) with back pain as one of the most important predictors of CAM use (Broom et al., 2012a; Côté et al., 2001; Kirby, Broom, Sibbritt, Adams, et al., 2013). Chiropractic, osteopathy, acupuncture and massage therapy are the more commonly used CAM treatments by back pain sufferers besides a vast range of other practitioner-based CAM (Kanodia et al., 2010; Murthy et al., 2014a; Murthy et al., 2014b; Murthy, Sibbritt & Adams, 2015). Herbal medicines, vitamins and supplements have become popular self-prescribed CAM amongst back pain sufferers (Kanodia et al., 2010; Murthy et al., 2014a; Murthy et al., 2014b). The use of CAM for back pain is known to be common amongst middle-aged women who have higher levels of education, who live in urban areas and who have higher income (Broom et al., 2012a; Sibbritt, D. W., & Adams, J., 2010).

There is increasing evidence that women with back pain tend to be also higher users of conventional medical care (Burke et al., 2006; Wade et al., 2008) and the use of CAM for back pain as identified by population-based studies appears to be supplementary to conventional medicine use (Côté et al., 2001; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013; Murthy et al., 2014a; Murthy et al., 2014b). Clinical guidelines for back pain care remain unclear (Nachemson et al., 2000; van Tulder, M. et al., 2000) and the role of CAM in the management of back pain is ill-defined (Licciardone, J. et al., 2005; Rubinstein, S. et al., 2011; Weiner, D. K. & Ernst, 2004). Although, there is some evidence on the effectiveness of manipulative therapies in chronic back pain (Bronfort et al., 2004), the evidence for CAM products and medicines such as herbal medicines are poorly understood (Gagnier, J J et al., 2007). Despite all these pressing circumstances, we still know little about what influences back pain sufferers' decision-making regarding CAM use. In addition, non-disclosure of CAM use by patients in general appears common (Robinson & McGrail, 2004). While some studies report general practitioner (GP) recommendation motivating back pain sufferers to use CAM (Chenot et al., 2007; Millar, 2001), previous research has also reported family, friends and media as influencing decision-making on CAM use for various illnesses including back pain (Wade et al., 2008; Xue, C., C L et al., 2008). Research on both factors influencing back pain sufferers' decision-making on the use of CAM as well as their communication about CAM use with their health care providers remains underdeveloped, especially in terms of previous studies either on the use of CAM in general (including but not specific to back pain) and/or employ small sample sizes. In response to this significant research gap, this paper reports analysis of back pain sufferers' communication about use of CAM with health care providers and factors influencing decision-making on CAM use for back pain-related symptoms among a nationally representative sample of Australian women.

7.4 Methods

7.4.1 Sample

The research reported in this paper constitutes a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH was designed to examine multiple factors affecting the health and wellbeing of women over a 20-year

period starting from 1996. Women in three age groups ('young' 18-23, 'mid' 45-50 and 'older' 70-75 years) were randomly selected from the national Medicare database and the participants were broadly representative of the national population of women in the respective target age group in the baseline survey (Brown, W. J. et al., 1999). The participants for this sub-study were recruited from the 1946-51 cohort of the ALSWH sample, aged 60-65 years at the time of the sub-study survey conducted during 2011/2012. Of the 10,011 women who participated at the sixth ALSWH survey (during 2010), 1,851 women indicated that they had experienced back pain. In 2011, sub-study questionnaires were posted to these 1,851 women across Australia. Written informed consent was obtained from the participants for this sub-study in addition to the consent the participants had given to the ALSWH study. Relevant ethical approval was gained from the Human Ethics Committees at the University of Newcastle, University of Queensland and University of Technology Sydney, Australia.

7.4.2 Demographic measures

Marital status, highest educational qualification, income and area of residence (urban or rural) as reported in the sixth ALSWH survey in 2010 were used as participants' demographic characteristics in this study.

7.4.3 Back pain sufferers' communication regarding CAM use

Women were asked if they had consulted their GP or a pharmacist *before* using CAM for their back pain and whether they had informed their GP or pharmacist *after* using CAM for their back pain. Women were asked if they felt able to talk to their GP about their CAM use (if applicable). Women were asked if they had consulted a CAM practitioner and a GP, whether they felt able to talk to their CAM practitioner about their GP consultation for their back pain. Women were also asked if they had consulted more than one CAM practitioner, whether they felt able to talk to one CAM practitioner about their consultation with another CAM practitioner for their back pain. Women were asked if they had self-prescribed CAM treatment for their back pain and had consulted a GP, whether they felt able to talk to their GP about their self-

prescribed CAM. Women were asked if they had self-prescribed CAM treatment for their back pain and had consulted a CAM practitioner, whether they felt able to talk to their CAM practitioner about self-prescribed CAM for their back pain.

7.4.4 CAM related information-seeking behaviour

Women were asked about information sources that were influential in their decision-making on the use of CAM for their back pain. The sources of information included, family or relatives, partner, friends or colleagues, Internet, book or magazine, mass media (e.g. newspaper, TV, radio), doctor, pharmacist, allied health worker (e.g. nurse) and CAM practitioner.

7.4.5 Consultations with CAM practitioners

Women were asked about their consultations with chiropractors, acupuncturists, herbalists/naturopaths, massage therapists and osteopaths for back pain.

7.4.6 Back pain-related health concerns

Women were asked: 'During your last period of back pain, did you seek help for any of the following symptoms or conditions relating to back pain?' Information was collected on a range of symptoms associated with back pain including headaches/migraines, leg pain/sciatica, arm pain, pins and needles/numbness, stiffness, fatigue, weakness and sleeping problems. The list of CAM practitioners included a chiropractor, an acupuncturist, an herbalist/naturopath, a massage therapist and an osteopath.

7.4.7 Statistical analysis

The association between influential information sources and CAM practitioner consultations for back pain-related symptoms was investigated using bivariate analysis, specifically, a chi-square test. Logistic regression modelling was employed

to identify the significant information sources predicting consultations with CAM practitioners for back pain-related symptoms. All information sources were entered into a multiple logistic regression model and a backward stepwise elimination process was employed using a likelihood ratio test to help establish the most parsimonious model. Statistical significance was set at $P < 0.05$. All analyses were conducted using statistical software Stata 11.2.

7.5 Results

Of the 1,851 women to whom the sub-study questionnaire was mailed, there were 5 drop outs from ALSWH, 2 were deceased, 34 women elected not to participate in this sub-study, one was overseas and 92 women were ineligible as they did not suffer from back pain at the time of the sub-study survey. Therefore, from a total of 1,620 women who were eligible for participating, 1,310 women completed the survey representing a response rate of 81%. The majority of women were married or in a de facto relationship (75%, $n=969$), had at least a high school education (68%, $n=848$), reported being able to manage on available income (66%, $n=855$) and resided in urban areas (90%, $n=1,171$).

The majority of women had consulted one or more CAM practitioner for their back pain (76%, $n=1,001$) in the previous twelve months. The prevalence of CAM practitioner consultations for back pain was massage therapist ($n=578$, 41.4%), chiropractor ($n=488$, 37.3%), acupuncturist ($n=174$, 13.3%), herbalist or naturopath ($n=125$, 10%), yoga or meditation practitioner ($n=124$, 9%), osteopath ($n=115$, 9%) and other forms of CAM practitioners ($n=324$, 25%). The other forms of CAM practitioners included reflexologist, reiki therapist, aromatherapist, traditional Chinese medicine practitioner and craniosacral therapist. The prevalence of self-prescribed CAM treatment for back pain by women was 75% ($n=985$). Women had self-prescribed supplements ($n=776$, 59%), vitamins/minerals ($n=592$, 45%), yoga/meditation ($n=187$, 14%), herbal medicines ($n=172$, 13%), aromatherapy oils ($n=112$, 9%) and other alternative therapies ($n=329$, 25%).

Table 7.1 Back pain sufferers' communication regarding complementary and alternative medicine (CAM) use

Communication	Number of responses	Never (%)	Rarely (%)	Sometimes (%)	Always (%)
Consulted GP before using CAM	855	37	18	25	20
Consulted pharmacist before using CAM	860	49	13	24	14
Informed GP after using CAM	844	26	11	29	34
Informed pharmacist after using CAM	847	61	12	16	11
Felt able to talk to GP about CAM consultation	625	7	12	22	59
Felt able to talk to CAM practitioner about consulting GP	605	9	6	23	62
Felt able to talk to CAM practitioner about another CAM practitioner	472	12	8	32	48
Felt able to talk about self-prescribed CAM to GP	577	4	8	26	62
Felt able to talk about self-prescribed CAM to CAM practitioner	644	11	6	29	54

GP, general practitioner

Table 7.1 shows back pain sufferers' communication regarding CAM use. Of those women who used CAM for their back pain, 20% had always consulted their GP *before* using CAM and 14% always consulted a pharmacist *before* using CAM. Of the women who used CAM for their back pain, 34% always informed their GP *after* using CAM, and 11% informed a pharmacist always *after* using CAM. Of the women who used CAM and consulted a GP, 59% always felt able to talk to their GP about their CAM use. Of the women who had consulted a GP and had used CAM, 62% always felt they were able to talk to their CAM practitioner about consulting a GP. Of the women who had consulted more than one CAM practitioner, 48% always felt they were able to talk about their CAM consultation with another CAM practitioner. Of the women who had self-prescribed CAM for their back pain, 62% felt always able to talk to their GP about their self-prescribed CAM. Of the women who had self-prescribed CAM and consulted a CAM practitioner, 54% felt always able to talk about their self-prescribed CAM to their CAM practitioner.

Table 7.2 Influence of the different information sources for back pain sufferers regarding decision-making on Complementary and Alternative Medicine (CAM) use

Information source	Number of responses	Influence (n)	Influence (%)
Doctor	1,058	452	43
Friends or colleagues	1,022	398	39
Family or relatives	1,038	375	36
Partner	1,004	332	33
Alternative health practitioner	965	288	30
Pharmacist	961	189	20
Book or magazine	958	156	16
Mass media (eg. Newspaper, TV, radio)	955	108	11
Allied health worker (eg. Nurse)	931	92	10
Internet	938	56	6

Table 7.2 shows the influential information sources for back pain sufferers regarding their decision-making on the use of CAM. Of those women who used CAM, the most influential information sources upon their decision-making regarding CAM use were: doctors (43%); friends or colleagues (39%); family or relatives (36%); their partner (33%) and/or a CAM practitioner (30%).

Table 7.3 Bivariate associations between influential information sources and Complementary and Alternative Medicine (CAM) practitioner consultations for back pain-related symptoms

Influential factors	Headaches/ Migraines		Neck pain		Leg pain/Sciatica		Arm pain		Pins & needles/ numbness		Stiffness		Fatigue		Weakness		Sleeping problems	
	Yes (n=211)	No (n=1098)	Yes (n=529)	No (n=779)	Yes (n=425)	No (n=882)	Yes (n=210)	No (n=1097)	Yes (n=172)	No (n=1137)	Yes (n=359)	No (n=951)	Yes (n=103)	No (n=1202)	Yes (n=93)	No (n=1216)	Yes (n=100)	No (n=1210)
Family or friends	47%	34% *	39%	32%*	48%	37%*	8%	6%*	25%	14%*	14%	11%*	38%	44%*	15%	21%*	8%	10%
Partner	44%	30%	37%	30%*	46%	34%	7%	5%	20%	13%	12%	11%*	40%	45%	17%	22%*	9%	11%*
Friends or colleagues	45%	32%*	36%	32%*	46%	35%*	6%	6%*	20%	14%*	13%	11%*	44%	42%*	19%	20%	10%	10%*
Internet	44%	35%	38%	32%	51%	36%	8%	6%	30%	13%	15%	11%	45%	42%	23%	19%	13%	9%*
Book or magazine	45%	35%*	38%	32%*	48%	37%*	8%	6%*	24%	15%*	13%	11%*	44%	43%*	19%	20%*	12%	10%*
Mass media (eg. newspaper, TV, radio)	46%	32%	39%	30%	48%	35%	6%	6%	22%	14%	13%	10%	39%	44%*	15%	22%	11%	10%*
Doctor	49%	35%	39%	32%	53%	38%	8%	6%	32%	15%	19%	11%	49%	42%	16%	20%	9%	10%
Pharmacist	51%	35%	44%	32%	45%	38%	5%	6%	25%	16%	12%	11%	40%	43%	23%	19%	11%	10%
Allied health worker (eg. Nurse)	42%	36%	43%	32%	51%	38%	14%	5%	33%	15%	24%	10%	44%	43%	16%	20%	12%	10%
CAM practitioner	47%	26%*	43%	19%*	44%	22%*	46%	26%*	51%	26%*	48%	22%*	56%	27%*	51%	28%*	60%	27%*

* = p<0.05

Consultation with a CAM practitioner (i.e. chiropractor, acupuncturist, herbalist/naturopath, massage therapist, osteopath) for back pain related-symptoms was common, with 52% (n=676) of women consulting one or more CAM practitioners for a variety of symptoms as shown in Table 7.3. Bivariate analysis showed that amongst factors influencing decision-making on CAM use for back pain-related symptoms, the statistically significant factors (all $P < 0.05$) mostly included family/relatives, friends/colleagues, book/magazine and CAM practitioners. Book/magazine did not influence women in their decision to consult a CAM practitioner for weakness related to back pain ($P = 0.044$). Internet and mass media (e.g. newspaper, TV, radio) had little influence on women's decisions to consult a CAM practitioner for sleeping problems (both $P < 0.05$). Mass media did not influence women in their decision to consult a CAM practitioner for fatigue related to back pain ($P = 0.023$). Women were not influenced by their partners to consult a CAM practitioner for neck pain, stiffness, weakness and sleeping problems (all $P < 0.05$). Doctors, allied health workers (e.g. nurse) and pharmacists showed no significant association with women's decisions to consult a CAM practitioner for most of the symptoms related to back pain except that pharmacists influenced women regarding consulting a CAM practitioner for stiffness related to back pain ($P = 0.024$).

Table 7.4 Logistic regression analyses of influential information sources and Complementary and Alternative Medicine (CAM) practitioner consultations for back pain-related symptoms

Influential factors	Headaches/ Migraines (n=898)	Neck pain (n=896)	Leg pain/Sciatica (n=911)	Arm pain (n=917)	Pins & needles/numb ness (n=964)	Stiffness (n=897)	Fatigue (n=900)	Weakness (n=920)	Sleeping problems (n=899)
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Family or relatives	1.71(1.17, 2.49)**	1.80(1.32, 2.46)***	1.62 (1.19, 2.19)**					2.03 (1.21, 3.43)**	
Partner						1.58 (1.12, 2.24)**			
Friends or colleagues						1.54 (1.09, 2.16)*			
Book or magazine	1.82 (1.14, 2.92)*	1.55 (1.02, 2.37)*		2.41 (1.58, 3.69)***			2.66 (1.53, 4.63)***		2.58 (1.43, 4.65)**
Doctor	0.66 (0.44, 0.99)*	0.59 (0.43, 0.81)***				0.48 (0.34, 0.68)***		0.54 (0.31, 0.93)*	
Pharmacist									0.40 (0.19, 0.85)*
Allied health worker (eg. nurse)	0.41 (0.20, 0.86)*	0.44 (0.25, 0.77)**	0.50 (0.29, 0.86)*			0.54 (0.30, 0.96)*	0.29 (0.11, 0.79)*		
CAM practitioner	2.78 (1.88, 4.11)***	3.59 (2.53, 5.10)***	3.23 (2.32, 4.49)***	2.16 (1.50, 3.12)***	2.98 (2.06, 4.29)***	3.35 (2.36, 4.76)***	3.73 (2.28, 6.09)***	2.62 (1.55, 4.43)***	3.81 (2.27, 6.39)***

OR, odds ratio; CI, confidence interval

*P<0.05, **P < 0.01, P< 0.001 = 01

The logistic regression models presented in Table 7.4 show that several sources of information were found to be influential with regard to women's CAM practitioner consultations for specific back-pain related symptoms. Family/relatives had a positive influence on women's decision to consult a CAM practitioner with regard to back pain-related headaches/migraines (OR = 1.71; $P = 0.005$), neck pain (OR = 1.80; $P < 0.001$), leg pain/sciatica (OR = 1.62; $P = 0.002$) and weakness (OR = 2.03; $P = 0.007$).

Women were positively influenced by their partners (OR = 1.58; $P = 0.008$) and friends/colleagues (OR = 1.54; $P = 0.012$) in their decision to consult a CAM practitioner for stiffness related to back pain. Book/magazine sources had a positive influence on women's decision to consult a CAM practitioner for headaches/migraines (OR = 1.82; $P = 0.012$), neck pain (OR = 1.55; $P = 0.039$), arm pain (OR = 2.41; $P < 0.001$), fatigue and sleeping problems (OR = 2.58; $P = 0.002$).

CAM practitioners influenced women positively in deciding to consult a CAM practitioner for all of the symptoms related to back pain; headaches/migraines (OR = 2.78; $P < 0.001$), neck pain (OR = 3.59; $P < 0.001$), leg pain/sciatica (OR = 3.23; $P < 0.001$), arm pain (OR = 2.16; $P < 0.001$), pins and needles/numbness (OR = 2.98; $P < 0.001$), stiffness (OR = 3.35; $P < 0.001$), fatigue (OR = 3.73; $P < 0.001$), weakness (OR = 2.62; $P < 0.001$) and sleeping problems (OR = 3.81; $P < 0.001$).

Doctors and allied health workers (e.g. nurses) negatively influenced women in their decision to consult a CAM practitioner for headaches/migraines (doctors: OR = 0.66; $P = 0.047$; allied health workers: OR = 0.41; $P = 0.018$), neck pain (doctors: OR = 0.59; $P = 0.001$; allied health worker: OR = 0.44; $P = 0.004$) and stiffness (doctors: OR = 0.48; $P < 0.001$; allied health worker: OR = 0.54; $P = 0.039$) related to back pain. Also, doctors negatively influenced women's decision to consult a CAM practitioner for weakness (OR = 0.54; $P = 0.029$). Allied health workers negatively influenced women's decision to consult a CAM practitioner for leg pain/sciatica (OR = 0.50; $P = 0.012$) and fatigue (OR = 0.29; $P = 0.016$). Pharmacists negatively influenced women's decision to consult a CAM practitioner for sleeping problems (OR = 0.40; $P = 0.018$) related to back pain.

7.6 Discussion

This paper reports the first examination of the influence of information sources and communication with a range of health care providers upon back pain sufferers' decision-making regarding CAM use. Drawing upon a large nationally representative sample of Australian women, our analysis identifies three key findings.

First, our study reveals that the majority of women who consulted a GP as well as used CAM for treating their back pain (through consultations with a CAM practitioner and/or self-prescribing CAM) felt comfortable communicating with their GP about such CAM use. This finding is in contrast to previous research identifying non-disclosure of CAM as a common and important issue amongst CAM users in general (Robinson & McGrail, 2004) and also specifically for pain management (Gratus et al., 2009; Sleath et al., 2008). However, whilst communication about CAM use with GPs (before and after using CAM) may be typical for the participants in our study, this finding cannot be generalised across the wider population, as our sample was restricted to only female back pain sufferers aged 60-65 years. Furthermore, we are unable to ascertain from our study whether such open communication with a GP is initiated by the women or their doctors. As such, there is a need for further research to examine patient communication with GPs about CAM use for back pain in more detail drawing from a wider population of back pain sufferers.

Second, women with back pain in our study utilised both professional (predominantly GPs or CAM practitioners) and non-professional sources of information (predominantly friends/colleagues, family/relatives or partner) with regard to their CAM use decision-making. Considering that many women in our study communicated about their CAM use with their GP, it is not surprising that GPs played an influential role in participants' decision-making regarding such use. The high prevalence of consultation with a CAM practitioner for back pain in our study also suggests that CAM practitioners are likely to have had ample opportunity to influence women in using CAM for back pain-related symptoms. Meanwhile, the influential role of family, friends, relatives, colleagues or partners upon women's decision-making regarding CAM use for back pain is perhaps not too surprising given that previous research (beyond back pain) has identified personal experience and recommendations as

significant drivers for CAM use (Chenot et al., 2007; Gaul et al., 2011; Sherman, K. J. et al., 2004) and non-professional information sources play an important role in influencing patients in their decision to use CAM (Chenot et al., 2007; Gaul et al., 2011; Sherman, K. J. et al., 2004). It is a cause for concern that non-professional information sources should have a such strong influence on women's decision to use CAM for symptoms associated with back pain, as recommendations by non-professional sources do not guarantee safe and effective choices (Gratus et al., 2009).

Third, while professional and non-professional information sources were both influential on decision-making by back pain sufferers with regard to using CAM, all professional sources of information (i.e. GPs, pharmacist, nurse) except CAM practitioners influenced women negatively in their decision-making on CAM use for back pain symptoms. Such negative influence by GPs/allied health care professionals on back pain sufferers' choice of CAM for back pain-related symptoms such as headaches/ migraines or neck pain may well reflect the current gap in evidence for CAM treatments in the management of these symptoms (Bronfort et al., 2004; Evans & Taylor, 2006; Furlan et al., 2012; Mauskop, 2007). Moreover, inter-professional differences among GPs/allied health care professionals and CAM practitioners (Norris, 2001) may further contribute to GPs/allied health care professionals' caution in considering CAM as a treatment option for back pain symptoms. However, it is noteworthy that in countries such as Germany, where it is not uncommon for GPs to receive training in and/or to use CAM treatments in their practice (Chenot et al., 2007; Chenot et al., 2006; Joos, Musselmann & Szecsenyi, 2010), GPs seem to have a more positive attitude towards CAM treatments, especially in the management of pain-related conditions (Chenot et al., 2006; Joos et al., 2010). Future research is necessary to provide detailed examination of the barriers and promoters for GPs/allied health care professionals in recommending CAM treatments in the management of back pain-related symptoms.

Our study has certain limitations. For example, the survey relied on self-reported information by the study participants, which may result in recall bias. In addition, we have used stepwise regression modelling as part of our statistical analyses. This approach has been criticised as potentially producing biased coefficients and unreliable *P*-values (Babyak, 2004). As such, caution should be used when

interpreting our logistic regression findings. However, such limitations are countered by the opportunity to investigate a large nationally representative sample of women aged 60-65 years with back pain.

7.7 Conclusion

Many female back pain sufferers using CAM in our study appear to communicate with their GPs about such use as well as rely upon both non-professional and professional sources of information in their decision-making regarding CAM use. While family/friends have a positive influence on back pain sufferers' decision to use CAM for symptoms associated with back pain, GPs have a negative influence. It is important that back pain care providers are aware of the drivers for their patients' choices of back pain treatments and be ready to openly discuss patients' CAM use in order to help back pain sufferers by informing them on relevant evidence-base for back pain treatment.

7.8 Chapter summary

The results of this chapter revealed a substantial level of communication by back pain sufferers about CAM use with GPs and CAM practitioners both about CAM practitioner consultations as well as self-prescribed CAM treatments. The chapter also revealed that GPs and allied health care providers negatively influenced women's decisions to consult CAM practitioners for back pain-related symptoms. Although considerable levels of communication between back pain sufferers and GPs is an important finding, this study cannot establish whether GPs or back pain sufferers initiate communication about CAM use. Further, it is not possible to identify the reasons for GPs negatively influencing decisions by back pain sufferers on the use of CAM for back pain-related symptoms. The study also revealed that non-professional information sources were positively associated with women's decisions to use CAM for back pain-related symptoms. Future research is needed to give more detailed consideration on positive as well as negative drivers for CAM use in back pain resulting from communication between back pain sufferers and conventional

health care providers as well as non-professional information sources such as family and friends. A detailed discussion on the results of this chapter and the results of Chapters 4, 5, 6 and 7 will be conducted in Chapter 8.

8 Discussion

This body of work comprises crucial knowledge about back pain care in Australia. The publications that form the Results Chapters of this thesis have addressed numerous discussion points. This chapter outlines the wider implications of these findings. In this chapter the significance and implications of the findings with regard to CAM provision and self-prescribed CAM will be explored. This chapter will also discuss various limitations of the research presented in this thesis, and suggest future research directions for CAM use by middle-aged women for back pain. Due to the HSR approach of this study, the findings of this thesis will also be of benefit to a range of back pain care providers including conventional medical professionals, allied health care professionals, CAM practitioners, back pain sufferers as well as health policy makers.

8.1 Primary findings from the research

Back pain and its associated disorders are a complex issue both in terms of back pain not being a clearly identifiable diagnostic condition as well as lacking a standard approach to its management despite clinical guidelines recommending multidisciplinary treatments including analgesics and NSAIDs, as highlighted in Chapter 1. It is particularly concerning that the success rate of treatment for chronic back pain and associated functional disorders is poor (Pengel et al., 2003) and that a significant proportion of people do not recover from (the associated disorder of) acute low back pain, progressing to chronic back pain, even when treated with 'best practice' care (Henschke et al., 2008). In addition to coping with pain, these patients typically experience reduced physical function and psychological distress (Bogduk, 2004).

Therefore, for many persons with back pain 'conventional' treatments have significant limitations (Walker, B. F. et al., 2004a) and thus they may seek help from a wide range of treatment and provider options, particularly complementary and alternative medicine (Walker, B. F. et al., 2004a). Hence, use of CAM for back pain becomes an

important health issue, particularly amongst women, as back pain sufferers look for alternatives to conventional care options for the treatment of their back pain. As such, this study directly contributes to our understanding of this important issue through utilising a large nationally representative sample of Australian women with back pain aged 60-65 years. The key findings of the study presented in this thesis are: 1) a high level of CAM practitioner and/or self-prescribed CAM usage amongst women aged 60-65 years with back pain; 2) back pain sufferers' use of specific and different CAM practitioners and/or self-prescribed CAM treatments is associated with specific types of conventional and/or allied health care practitioner use; 3) certain attitudes toward CAM by women with back pain are associated with their choice of specific CAM practitioner group and/or self-prescribed CAM treatments; and 4) back pain sufferers' choice of specific and different CAM practitioner groups is associated with specific influential information sources as well as specific back-pain related symptoms.

8.2 The prevalence of CAM practitioner and/or self-prescribed CAM use is high amongst women with back pain aged 60-65 years

This thesis has highlighted that the majority of women (more than two thirds) aged 60-65 years consult at least one type of CAM practitioner and/or self-prescribe at least one CAM treatment for their back pain (Chapter 4 & 5). As noted in the Background Chapter, there is a wide-range of CAM options available for back pain care and findings reported in this thesis show that back pain sufferers visited different CAM practitioners and/or used different self-prescribed CAM, with some CAM modalities being more popular than others. Further, women's consultations with different CAM practitioner groups were associated with relief for specific back pain related symptoms. Such variations in back pain sufferers' choices of CAM can be expected due to the heterogeneous features within CAM and/or differences in the understanding of back pain care central to the different CAM modalities as well as women's expectations of desired outcomes from different CAM modalities for back pain and associated symptom relief. The prevalence of CAM use as well as the different rates of prevalence of specific CAM may be due to women's different attitudes and/or conventional back pain care providers' perceptions of, and attitudes toward, different CAM modalities for back pain. Further, such high prevalence of CAM use, in particular, self-prescribed CAM, raises a number of important health service

issues around safety and possible risks of CAM use. The details of these issues are discussed further below.

8.2.1.1 Women's choice of CAM in back pain care may reflect the popular notions and/or emerging knowledge on specific CAM

The frequency of use of some CAM practitioner groups (e.g. massage therapist, chiropractor, acupuncturist) and some self-prescribed CAM (e.g. supplements, vitamins/minerals) is higher than others (e.g. osteopath, aromatherapy oils) as shown in the Results Chapters. Due to an emerging knowledge about the benefits of certain CAM in back pain care and/or the popular notions about specific CAM, back pain sufferers may have an expectation that certain CAM may be suitable for their back pain (Furlan et al., 2002; Furlan et al., 2005; Globe et al., 2016).

Findings reported in this thesis show that consultations with massage therapists were the most popular treatment choice for back pain. This finding is not surprising as previous studies have shown that, of all the various CAM treatments, massage therapy is a widely known and accepted therapy by the general public, particularly for its use in pain relief (Sherman, K. J. et al., 2004; Walker, B. F. et al., 2004a). Also, due to possible previous experience of receiving massage therapy, many back pain sufferers may be willing to try massage therapy and have expectations of the benefit of massage in back pain care both in acute and chronic states of this condition (Sherman, K. J. et al., 2004). An interesting finding in this research is that consultations with massage therapists were significantly associated with seeking help for several back pain related symptoms including neck pain, arm pain, stiffness and anxiety/tension (see Chapter 4, Section 4.4). Such a broad spectrum of symptoms is typical for back pain sufferers especially when the condition is chronic and accompanied by functional limitations (as noted in the Background Chapter). As such, back pain sufferers may choose a more generic or holistic body therapy such as massage with possible effects on a range of musculoskeletal symptoms besides relaxation, as opposed to specialised back pain relieving manipulative CAM

therapies. In addition, as the integrative literature review included in this thesis demonstrated that back pain sufferers use CAM as an additional treatment option to conventional medical care, it is quite possible that back pain sufferers are likely to choose CAM therapies such as massage that are perceived to be beneficial and generally involve low risk intervention. There is however some evidence as revealed by Cochrane/systematic reviews that massage therapy can be effective in sub-acute and/or chronic low back pain and previous research suggests that massage therapy may be more effective than relaxation or physical therapies in back pain (Furlan et al., 2002; Furlan et al., 2009). The notions of perceived benefits of massage therapy either via evidence or popular belief as determinants for the choice of massage therapy in back pain is not verifiable through this research and therefore requires future investigation.

Chiropractic and osteopathy, although used less frequently by women in this study in comparison to massage therapy, were nevertheless popular CAM therapies for back pain. As described in the Background Chapter, chiropractic and osteopathy, whilst claiming to treat a wide range of health conditions, are mostly known to possess good evidence for treating low back pain (Globe et al., 2016; Licciardone, J. et al., 2005). Such evidence and /or the popular knowledge regarding both chiropractors' and osteopaths' approaches of utilising physical manipulation to resolve functional disorders of the musculoskeletal system (see Chapter 1) may explain the popularity of chiropractic and osteopathy in back pain care. Women's choice of chiropractors was associated with seeking help for back pain related issues such as leg pain, neck pain and headaches. As noted in the integrative literature review (see Chapter 2) studies showed use of chiropractic/osteopathy linked with treating neck pain (Wolsko et al., 2003). It can be interpreted that leg pain associated with back pain may well be related to sciatica (as noted in the Background Chapter), for which women in this study may have chosen chiropractic and/or osteopathy. Whilst this study showed that women's consultations with chiropractors was associated with seeking help for headaches related to back pain, there is little evidence for the effectiveness of chiropractic in treating headaches as such (Astin & Ernst, 2002). Interestingly, back pain sufferers in this study who had sleeping problems were less likely to consult a chiropractor or an osteopath in comparison with those who did not have sleeping problems. This may be due to the generally held notion of chiropractic and osteopathy as manipulative treatments focusing on joints, bones, nerves and muscles

to resolve mechanical disorders of the musculoskeletal system and as such not being associated with sleeping problems. It is not possible to explain if back pain sufferers in this study chose chiropractic and/or osteopathy based on knowledge about published research on clinical outcomes and therefore this remains a topic for future research. It is likely that health professionals and/or family/friends may have recommended or suggested chiropractic and osteopathy based on knowledge of evidence or personal experience with the use of chiropractic/osteopathy for back pain and back pain related symptoms.

Findings of this research show that acupuncture is a popular CAM treatment amongst back pain sufferers next to massage therapist and chiropractic consultations, and women's visits to acupuncturists were associated with seeking help for back pain related headaches and leg pains. Apart from consultations with chiropractors being associated with back pain related headaches, the only other CAM practitioner group to be consulted for back pain related headaches were acupuncturists in this study. The use of acupuncture for treating pain syndrome is well documented and patients report self-perceived effectiveness as shown in population-based studies and studies in clinical settings from across nations, as noted in the Integrative literature review (see Chapter 2) (Chenot et al., 2006; Kanodia et al., 2010; Kirby, Broom, Sibbritt, Adams, et al., 2013). The value of acupuncture for the treatment of headaches is confirmed by a Cochrane systematic review (Melchart et al., 2001). A meta-analysis noted that acupuncture is effective in chronic low back pain but did not show sufficient evidence for its effectiveness in acute low back pain (Manheimer et al., 2005). A systematic review using the Cochrane framework also found that acupuncture is effective in pain relief and functional improvement in chronic back pain but was not effective in acute low back pain (Furlan et al., 2005). Another study in a clinical setting found that female gender, advanced age and chronicity of low back pain were strongly associated with receiving acupuncture and this study also found acupuncture to improve pain/functional ability in chronic low back pain, but concluded that use of acupuncture may reflect helplessness by both patients as well as health care providers (Chenot et al., 2006). It is therefore possible to interpret that back pain sufferers chose acupuncture perhaps as an adjunct treatment specially to deal with severe or recurring pain in chronic low back pain. Also, health care providers and/or those who support back pain sufferers may play a role in directing back pain sufferers

towards receiving acupuncture, but it is beyond the scope of this study to confirm such assumptions, hence needing future research attention.

Use of yoga/meditation by back pain sufferers was prevalent in this study with higher frequency of use for self-prescribing yoga/meditation (14.3%) in comparison to women consulting yoga/meditation practitioners (9.5%) for their back pain. High use of yoga/meditation is typical for women, as noted in Chapter 1 (see Section 1.4.2.3). It can be expected that back pain sufferers, particularly those with chronic low back pain may have found yoga/meditation a useful tool as it comprises of a range of practices including physical postures, body awareness techniques, breath control techniques and home practice perhaps contributing towards reducing pain-avoidant posture and/or psychological stress, which is common in persons with chronic back pain (Wren et al., 2011). Yoga, being an unregulated profession and with yoga therapy being a relatively underdeveloped model of back pain care (see Section 1.7.6), it is understandable that women are likely to use yoga/meditation as a self-administered practice rather than consulting yoga/meditation practitioners. Besides, it is unlikely that back pain sufferers would chose yoga/mediation as their primary approach for treating back pain and more likely to use yoga/meditation for managing functional disability caused by back pain (Sorosky, Stilp & Akuthota, 2008; Williams, K. A. et al., 2005). This may explain the higher prevalence of self-prescribed yoga/meditation requiring daily practice in comparison to consultations with yoga/meditation practitioners as a therapy for back pain. The use of yoga/mediation in back pain has been shown to be of value by clinical trials (Wren et al., 2011). A study using a yoga intervention programme for persistent low back pain including yoga postures to relieve tension, increase body awareness, lengthen and stretch muscle groups of the spine and pelvis showed reduction in pain and pain medication and improved functional disability following the intervention and at 3-month follow-up (Williams, K. et al., 2009). An interesting finding in the study of this thesis showed that back pain sufferers' consultations with yoga/meditation practitioners was associated with seeking help for back pain related fatigue. There may be several reasons for the association between yoga/practitioner consultations and fatigue amongst back pain sufferers. These may include fatigue as functional disability amongst back pain sufferers, diagnosis of 'chronic fatigue syndrome' with back pain as a symptom or diagnosis of fibromyalgia, with common approaches in these possible psycho-somatic conditions emphasising active life, gentle exercise and relaxation, yoga/meditation

practice may well represent a suitable model for addressing fatigue (Bentler, Hartz & Kuhn, 2005). It can be speculated that women in this study may have chosen to consult a yoga/meditation practitioner for back pain and/or back pain related fatigue by exploring popular information on yoga/meditation or due to recommendations by health care professionals or women's previous personal experience of yoga/meditation. However, it is not possible to confirm these assumptions and as such the drivers for choosing yoga/meditation for specific therapeutic outcomes needs further research.

Women's consultations with herbalists/naturopaths for back pain in this study showed significant association with consultations for back pain related symptoms including neck pain, fatigue and anxiety/tension (see Section 4.4). Considering that naturopaths/herbalists employ a wide range of approaches such as nutritional medicine (e.g. diet, vitamins/minerals/supplements), herbal medicine, patient self-care education (e.g. relaxation techniques) and possibly massage therapy (as noted in the Background Chapter), it can be expected that women consult naturopaths/herbalists for much broader health care requirements including but not limited to back pain. This may explain why women in this study may have consulted naturopaths/herbalists for a range of back pain related symptoms. It is also possible that back pain sufferers who seek natural alternatives for pharmaceutical medications may choose to consult naturopaths/herbalists, as Australian naturopaths dispense compounded liquid herbal extracts (see Section 1.7.8). However, it is not possible for this study to ascertain if women seek naturopaths/herbalists as an alternative to avoid pharmaceutical medications for back pain and therefore this question needs further research investigation.

The findings in this study revealed that a sizable majority of back pain sufferers had self-prescribed one or more of supplements, vitamins/minerals, herbal medicines and aromatherapy oils (see Section 5.5). This finding is particularly interesting as the prevalence of CAM practitioner consultations also is high amongst participants in this study. It is possible that back pain sufferers who have gained knowledge about certain commonly used CAM products for back pain via initially consulting with CAM practitioners may later chose to self-prescribe those CAM products for recurrent or ongoing back pain. It is also likely that back pain sufferers may chose CAM products for self-prescribing as they are readily available, perhaps more economical than

consulting a CAM practitioner and/or the information is easily available from popular media and retailers. Although most of the CAM products are tested for safety according to the requirements set by the Therapeutic Goods Administration (as described in the Background Chapter), the fact that a vast majority of CAM products are self-prescribed raises important questions regarding the appropriateness of such CAM product use by back pain sufferers. There is little evidence on the benefits and risks of CAM products in back pain care (as noted in the Background Chapter) and even when there is evidence for CAM products, it usually is for single herb extract or a single constituent as opposed to mixed formulation, which typically constitute CAM products sold over-the-counter (Chrubasik et al., 2007). Despite little evidence on CAM products, opportunities for minimising potential risks is possible if back pain sufferers are in consultation with an herbalist/naturopath, who through their clinical experience might be in a position to consider possible herb-herb, herb-supplement, herb-vitamins/minerals and/or supplement-vitamin/mineral interactions. It can also be expected that GPs/specialists would be able to identify possible risks in their patients taking single or multiple CAM products for back pain. However, previous research has shown that conventional medical professionals have limited knowledge on CAM products (Leach, 2004). Further, the role that professional and non-professional information sources play in back pain sufferers' choice of self-prescribed CAM products is important in determining self-prescribing CAM products and this is discussed elsewhere. However, the dynamics of self-prescribing CAM products by back pain sufferers in terms of the reasons for self-prescribing CAM products, decisions on the type of CAM products chosen and decision on the duration of taking CAM products is beyond the scope of this study and as such requires further research attention.

8.2.1.2 Perceptions on CAM and referral by conventional medical and allied health care providers may influence women's choice of CAM in back pain care

The findings presented in this thesis demonstrated strong positive associations between women's visits to allied health care providers, particularly pharmacists, and overall CAM practitioner consultations and self-prescribed CAM treatments by back

pain sufferers. The possible influences that pharmacists may have on back pain sufferers' CAM usage are multi-fold. Some of these key factors have been discussed in the discussion sections of Chapter 4 (see Section 4.5) and Chapter 5 (see Section 5.6) respectively and include: pharmacists present an interface between back pain sufferers and CAM by being ideally positioned to provide information on CAM products (Brown, J. et al., 2008; Farrell et al., 2008; Olatunde et al., 2010); pharmacists may influence decision-making on CAM use by counselling customers (Kanjanaarach, T et al., 2011); and pharmacists are known to be supportive of CAM products as retailers of non-pharmaceutical remedies (Kanjanaarach, T et al., 2011; Naidu et al., 2005). It is not surprising that pharmacist visits showed strong, positive association with women's use of self-prescribed herbal medicines, vitamins/minerals, supplements and aromatherapy oils in this study. It can be expected that pharmacists store these CAM products and therefore are able to provide a choice of CAM products to their customers with back pain. Key implications of pharmacists' influential role in customers' choices of CAM products are the limited research base for CAM products and lack of confidence amongst pharmacists to provide in-depth information on CAM products due to minimal training for pharmacists in CAM as shown in previous research (Brown, J. et al., 2008). Given the limited evidence on CAM products and possibly pharmacists' limited knowledge of CAM, it can be assumed that the strong association between pharmacist visits and self-prescribed CAM use may be due to informal advice by pharmacists such as encouraging back pain sufferers to 'try out' CAM remedies and/or recommending products that other customers have found useful for their back pain (Koh, Teo & Ng, 2003). From the findings of this study, it is however not possible to draw conclusions on the exact role that pharmacists played in back pain sufferers' choice of self-prescribed CAM and therefore this remains an important topic for future research.

Further, pharmacist visits showed positive associations with back pain sufferers' consultations with herbalists/naturopaths, massage therapists and yoga/meditation practitioners in this study. It is likely that pharmacists are supportive of CAM as herbal medicine, nutritional supplements and/or homeopathic products, which are commonly recommended by herbalists/naturopaths, attract customers to their pharmacy. Also, it is not uncommon for pharmacies in Australia to provide onsite advice by herbalists/naturopaths to their customers. However, there is no data on the proportion of pharmacies that provide herbalist/naturopath consultations onsite in Australia.

Considering that back pain is quite commonly associated with chronicity, persistent pain and/or most importantly functional disabilities, pharmacists may recommend approaches such as yoga/meditation and massage therapy as part of a broader care for back pain. However, it cannot be confirmed whether the association of pharmacy visits and consultations with specific CAM practitioner groups is due to the recommendation by pharmacists in this study and as such this topic needs further research investigation.

Visits to nurses show positive associations with consulting a yoga/meditation practitioner and/or self-prescribed yoga/meditation by back pain sufferers. Previous research indicates that nurses hold positive attitudes towards yoga and use of yoga amongst nurses is common (Shorofi & Arbon, 2010). A Canadian study of nurses aged 45 to 63 years showed that nurses used yoga/meditation to cope with their own musculoskeletal problems and associated symptoms (Cameron et al., 2008). It can be interpreted that nurses possibly advise yoga/meditation to their patients based on their own experience of using yoga/meditation in back pain and back pain related symptoms. Visits to nurses were also associated with massage therapists and osteopaths in this study as well as self-prescribing aromatherapy oils. Nurses might perhaps feel more comfortable recommending manual therapies such as massage and osteopathy than substance based CAM therapies. In particular, as osteopathy is a regulated profession in Australia, and as there is evidence for osteopathy in back pain care, it is possible that nurses may readily recommend osteopathy to their back pain patients. As already discussed in Chapter 5 (Section 5.6), nurses hold a positive attitude towards aromatherapy and as such nurses may have encouraged their back pain patients' use of aromatherapy oils.

The findings of this thesis also demonstrate strong positive associations between physiotherapist visits and consultations by back pain sufferers with acupuncturists or massage therapists. Previous research has shown that physiotherapists report acupuncture and massage as the two most popular CAM treatments used by their back pain patients and physiotherapists perceive acupuncture and massage as effective for acute, sub-acute and chronic low back pain (Hughes, C. et al., 2011). Therefore, it is possible that physiotherapists may have encouraged back pain sufferers' use of acupuncture and/or massage or recommended these CAM treatments in this study. However, it is interesting to note that physiotherapist visits

were negatively associated with consulting chiropractors. As discussed in Chapter 4 (Section 4.5), although allied health care professionals hold a positive attitude towards CAM (Charlie CL Xue et al., 2008), and although previous research shows that physiotherapists consider chiropractic as effective in back pain (Hughes, C. et al., 2011), the negative association in this study may well indicate professional discordance between physiotherapists and chiropractors. Whilst there is some evidence on inter-professional discordance (Norris, 2001), it is yet unclear whether physiotherapists' reserved attitude towards chiropractors is linked to the perceptions about the effectiveness of chiropractic in back pain care or due to competition between the two professions. It is therefore important for future research to investigate whether the attitudes allied health care professionals have towards CAM in back pain care is linked to their understanding of effectiveness of CAM treatments or whether other factors linked to professional differences. The findings presented in this thesis also showed that visits to physiotherapists were positively associated with back pain sufferers self-prescribing yoga/meditation. This is not surprising as previous research has shown that physiotherapists are supportive of yoga in the management of chronic back pain (Hughes, C. et al., 2011).

Visits to GPs by back pain sufferers, whilst negatively associated with consultations with CAM practitioners in general and in particular with chiropractors, was positively associated with self-prescribed CAM treatments. Further, GPs negatively influenced women in this study to consult CAM practitioners (i.e. chiropractors, acupuncturists, herbalists/naturopaths, massage therapists, osteopaths) for a range of back-pain related symptoms (i.e. headaches/migraines, neck pain, stiffness, weakness) (see Chapter 7, Section 7.5). Also visits to specialists were positively associated with self-prescribing CAM. These findings are of particular interest as they draw attention to a number of important issues including: GPs discouragement of back pain sufferers' consultations with CAM practitioners; back pain sufferers use of CAM despite GPs negative opinion on CAM; back pain sufferers' dissatisfaction with conventional medicine prompting self-prescribing CAM; and the influential role of communication between back pain sufferers and GPs in decision-making regarding CAM use.

A systematic review including conventional medical professionals' attitudes towards CAM showed that GPs were supportive of CAM (Frass et al., 2012) and Australian studies reported that nearly one third of the users of acupuncture, chiropractic and

osteopathy were referred to manipulative therapists by medical practitioners (Charlie CL Xue et al., 2008; Easthope, G, Tranter & Gill, 2000). This finding of positive attitudes by GPs towards CAM in previous research and the negative association between GP visits and CAM consultations in this study raises the question whether GPs attitudes towards specific CAM (e.g. acupuncture) may differ from their attitude towards CAM in general in the context of back pain care. It is also likely that GPs in Australia may not recommend their back pain patients to consult a CAM practitioner as the clinical guidelines for treating non-specific low back pain do not indicate a need for manipulative treatments and in cases where back pain sufferers need referral, clinical guidelines recommend referral to a specialist (Australian Acute Musculoskeletal Pain Guidelines Group, 2003). Although, as already discussed in chapter 4 (Section 4.5), professional discordance between GPs and CAM professionals may play a role in GPs discouraging back pain sufferers from consulting CAM practitioners, it is difficult to interpret whether GP's adherence to clinical guidelines, low evidence of CAM in back pain care or the competing market of back pain care provision contribute to GPs attitudes towards CAM consultations for back pain. It is also important to note that visits to GPs were negatively associated with consultations with chiropractors in this study. This finding is surprising as previous research showed that Australian medical practitioners appear to consider chiropractic as evidence-based medicine and particularly recommend chiropractic in musculoskeletal conditions (Charlie CL Xue et al., 2008). It is likely that the professional-discordance between GPs and chiropractors in Australia is a reason for the negative association between GP visits and chiropractic consultations for back pain. Therefore, the topic of GPs attitudes towards specific CAM and knowledge on CAM in back pain care needs further research investigation.

With regard to the positive associations between GP visits and self-prescribed CAM in general and self-prescribing herbal medicines, vitamins/minerals and supplements in particular, it is unlikely that GPs had recommended women to self-prescribe these CAM products for their back pain. Previous research, although showing that GPs are positive towards CAM, often the CAM therapies supported by GPs are acupuncture and CAM manipulative therapies but not herbal medicine or supplements due to lack of evidence (Leach, 2004). The frequent visits to GPs and/or specialists and self-prescribing CAM by women in this study may suggest that back pain sufferers, due to persistent pain and/or functional disability, explore different CAM products in

conjunction with conventional medicine. It is also possible that back pain sufferers may be dissatisfied with conventional medicines due to lack of improvement or adverse effects prompting them to self-prescribe CAM products. Considering that the majority of back pain sufferers in this study felt able to talk to their GP about self-prescribing CAM (see Chapter 7, Section 7.5), this finding raises questions on how GPs would have discussed their patients' self-prescribing CAM treatments. The topics of communication between GPs and back pain sufferers on self-prescribing CAM and GPs knowledge of herbal medicines, vitamins/minerals and supplements for back pain require detailed future research.

8.3 Women's choice of CAM use for back pain may be based on certain attitudes toward CAM

The findings of this study identified that back pain sufferers were partly influenced in their decision-making on using CAM by certain perceptions about CAM as being a natural and holistic approach to health and/or as giving the women control over their own health/body. These attitudes were not universal across all CAM practitioner consultations and self-prescribed CAM for back pain. Also, knowledge about evidence of CAM was perceived to be important in self-prescribing CAM for back pain. One or more of these attitudes toward CAM were found to influence certain CAM choices of consulting specific CAM practitioner groups as well as self-prescribing certain CAM products. The attitudes specific to types of CAM practitioner consultations (i.e. chiropractors) as well as specific self-prescribed CAM products (i.e. vitamins/minerals, supplements, herbal medicines) have been discussed in detail in Chapter 6 (see Section 6.6). It is interesting to note that certain attitudes commonly associated with CAM use, as shown in previous research on CAM use for chronic illnesses (including but not limited to back pain), were not significantly associated with decisions on CAM use for back pain in this study. These include: CAM has fewer side effects than conventional medicine; CAM practitioners spend more time with patients than a doctor does; CAM practitioners provide more support than a doctor; it is easier to talk to a CAM practitioner than a doctor; patients feel they can have more equal relationships with CAM practitioners than their doctors; doctors should be able to advise their patients about commonly used CAM for back pain; clinical evidence is

important in the choice of CAM; personal experience of effectiveness is more important than clinical evidence; and CAM needs to be tested for safety/side effects. For those attitudes which influenced back pain sufferers' decision-making on specific CAM, the key features highlighting such attitudes possibly include: the importance of self-management of back pain; finding natural and holistic approaches to disease management that fill a perceived gap in conventional medicine; and actively seeking information on ways to manage back pain. These features, acting as drivers for CAM use are quite common amongst CAM users and have been identified by previous research (Bishop, Felicity L et al., 2007). In contrast to some other chronic health conditions in which CAM use is popular (e.g. cancer), where belief about CAM seem to play an important role, back pain sufferers may take a more pragmatic approach to dealing with pain severity, chronicity and functional disability in exploring approaches for management of their illness and may not make decisions entirely on the basis of treatment philosophies. As this study found that back pain sufferers use CAM in addition to conventional medicine, women's attitudes towards CAM as an alternative to conventional medicine may not have dominated their reasons for choosing CAM. However, those attitudes that influenced women's choice of CAM in this study and especially the different attitudes associated with specific CAM choice may well be due to back pain sufferers' existing notions on CAM or may well be the result of having used CAM for back pain or other health conditions. A qualitative study interviewing 50 women from the same sample of this study found that familiarity with practitioner groups (e.g. chiropractic) or a particular practitioner (e.g. a chiropractor) were more influential on decision-making by back pain sufferers than evidence of efficacy of those respective treatment options (Kirby et al., 2014). It appears that belief in CAM as natural or holistic was more important for self-prescribing CAM for back pain than for consulting CAM practitioners in the study presented in this thesis. It is also possible that women may have been influenced by information sources on CAM besides attitudes towards CAM in their decision-making on CAM use and this aspect is discussed in Chapter 7 (Section 7.6). It is not possible for this study to gain a complete understanding of the influence of attitudes towards CAM on decision-making by back pain sufferers on CAM choices and therefore additional research is required to explore this topic further.

8.4 Women, despite being negatively influenced by conventional medical and allied health professionals, consult CAM practitioners

GPs, nurses and pharmacists negatively influenced back pain sufferers to consult CAM practitioners (i.e. chiropractors, acupuncturists, herbalists/naturopaths, massage therapists, osteopaths) for a range of back-pain related symptoms. At the same time, it is important to note that back pain sufferers were positively influenced by CAM practitioners to consult them for a wide range of back-pain related symptoms. In a study investigating GPs, allied health care providers' (e.g. pharmacists) and CAM practitioners' (e.g. chiropractors, acupuncturists) opinions about benefits and risks of other than their own specialised therapies for neck pain/arm pain, results showed that these professionals were the most convinced about therapies closest to their own background and most resistant towards therapies distant to their own backgrounds (Denyer et al., 2012). Such opinions of GPs, nurses and pharmacists could also have been a reason for the negative influence on CAM consultations for back-pain related symptoms in this study. As discussed previously (see Section 8.2.1.2), whilst lack of evidence for CAM in back pain and/or professional discordance amongst back pain care providers may play a role in the negative influence of GPs and allied health professionals on CAM consultations (Norris, 2001; Weiner, D. K. & Ernst, 2004), the high prevalence of CAM consultations in this study suggests that it may be likely for back pain sufferers not to place emphasis on evidence for CAM and/or unlikely to be interested in inter-professional representations in their decision to choose CAM practitioners. Also, it is possible that back pain sufferers may trust their CAM practitioners' opinions in as much as they might trust the opinions of GPs and/or allied health care professionals in their decision on CAM use for back pain. A separate qualitative study on women from the cohort of this study confirms such assumptions, as it concludes that choice of practitioner for back pain care was more influenced by anecdotal lay reports of effectiveness and the familiarity with CAM therapies (Kirby et al., 2014). It is interesting to note that besides CAM practitioners, friends/colleagues and family/relatives positively influenced back pain sufferers in their decision to consult a CAM practitioner for a range of back-pain related symptoms in this study. As found in the integrative literature review included in this thesis, family, friends, acquaintances and previous experience of CAM treatments were influential in back pain sufferers' decisions to choose CAM (see Chapter 2, Section 2.2.3.5). This probably suggests that friends/colleagues and family/relatives may play a central role

in back pain sufferers' decision-making on CAM practitioner consultations. The qualitative interviews with back pain sufferers of this study found that recommendations by significant others (neighbours, friends, other back pain sufferers) was a key factor for women in choosing a CAM practitioner (Kirby et al., 2014). Considering that women in this study concurrently utilised conventional and CAM back pain care options, it can be interpreted that back pain sufferers may be open to try more than one approach to back pain management irrespective of the opinions by professional sources of information on CAM use. These issues need further detailed research. Above all, future research needs to investigate what impact women's decisions to use multiple treatment approaches in back pain care may have on their back pain status as well as the economic impact caused by treatment not covered by health insurance and/or private health insurance rebates.

8.4.1 Women disclose CAM use for back pain to their GPs

The findings presented in this thesis demonstrate that the majority of women communicate with GPs prior to, and after, CAM use and most of the women feel comfortable talking to their GP about consulting CAM practitioners and/or self-prescribing CAM for their back pain (Chapter 7, section 7.5). As discussed in Chapter 7 (Section 7.6), back pain sufferers' disclosure of CAM use is in contrast to the findings of previous research on CAM use in general (Robinson & McGrail, 2004; Sleath et al., 2008). Women may feel comfortable to talk about their intention to use CAM and/or experience of using CAM especially chiropractic, osteopathy and acupuncture which are regulated professions in Australia and to a certain extent known to be effective in back pain care. Previous research on communication about CAM use with doctors in general (not related to back pain care) has shown that patients were willing to communicate if they felt their doctor was accepting of CAM, if their doctor was aware of common CAM treatments and if their doctor initiated conversation on CAM use (Shelley et al., 2009). The same study (Shelley et al., 2009) also showed that doctors were supportive of their patients' CAM use if they felt that the CAM their patient was using encouraged an attitude of self-care and was beneficial for their patient's wellbeing. Massage for instance may serve as an example of a CAM therapy that is generally perceived as relaxing and therefore beneficial and women may feel comfortable talking about their use of massage

therapy to their GPs. Women's communication with GPs on CAM use for back pain may also reflect curiosity amongst GPs and emerging knowledge about the possible benefits of specific CAM modalities especially in the context of chronic painful conditions. However, as discussed in Chapter 7 (Section 7.6), it is not possible to determine if the communication was initiated by GPs or by back pain sufferers nor the exact nature of communication between back pain sufferers and GPs in this study. In either case, although open communication about CAM use with GPs is desirable, the influence such communication has on back pain sufferers' decision-making on CAM use needs detailed research attention.

Overall, this thesis provides comprehensive findings with regard to consultations with a varied group of CAM practitioners and use of self-prescribed CAM for back pain; drawn from a large nationally representative sample of women aged 60-65 years. However, further research is necessary to provide more detailed, in-depth examination of back pain sufferers' perceptions and experience of CAM use, practice behaviour of GPs and allied health care back pain care providers regarding CAM and the extent and ways in which such conventional and allied health care providers may be influencing the treatment choices and decision-making by back pain sufferers.

8.5 Significance of the research findings

CAM is an important treatment option for back pain utilised by middle-aged women, generating much interest amongst back pain care providers including conventional medical and allied health care professionals and health policy makers. The present research aimed to address a broad range of issues concerning visits to CAM practitioners and the use of self-prescribed CAM treatments for back pain by women aged 60-65 years. The use of CAM by middle-aged women with regard to consultations with CAM practitioner groups and self-prescribing CAM treatments/products has not been previously investigated in such detail.

The first primary finding presented above relates to the high prevalence of CAM consultations and self-prescribed CAM treatments by female back pain sufferers aged 60-65 years. This study provides a number of close associations between specific

CAM practitioner groups/specific self-prescribed CAM treatments and various back-pain related symptoms. Women with back pain visit conventional medical practitioners or allied health care professionals alongside CAM practitioners and/or self-prescribing CAM treatments and as such, these results alert conventional medical practitioners and allied health care professionals to the high use of CAM amongst women aged 60-65 years. Female back pain sufferers aged 60-65 years consult varied CAM practitioner groups, some regulated professions and some professions that are not included in the national registration system (i.e. naturopaths/herbalists, massage therapists, yoga/meditation practitioners). The self-regulated CAM professions offering back pain care are an issue that health policy makers need to be aware of. Further, the high level of self-prescribed CAM treatments by back pain sufferers in this study raises concerns about the risks involved in women's choices of CAM products/treatments without guidance by health care providers. Conventional medical providers, allied health care professionals, CAM practitioners and health policy makers must be aware of female back pain sufferers' positive attitudes toward CAM in their choice of self-prescribed CAM treatments for back pain and back-pain related symptoms despite the lack of robust clinical evidence. Self-prescribing CAM products raises concerns about safety, efficacy and potential herb-drug interactions. In addition, non-professional information sources (i.e. family/relatives, partner, friends/colleagues, book/magazine) influence women's decision-making on self-prescribing CAM for back pain, thereby augmenting the above mentioned risks as women do not receive adequate guidance in their choices of self-prescribed CAM products by health care professionals. As women seek help from GPs, allied health care professionals and CAM practitioners alongside self-prescribing CAM products, it is important that these professionals actively engage in conversations with their back pain patients about products patients might be self-prescribing and guide patients regarding dangers that may arise from potential herb/supplement/drug interactions.

The second primary finding contained in this thesis is that women's attitudes toward CAM directed their preferences towards consulting specific CAM practitioner groups and self-prescribing CAM products for their back pain. The perception that CAM gives more control over health/body linked to consultations with chiropractors and self-prescribing supplements, indicates that self-management of their condition is important for women suffering from back pain. This finding reinforces that GPs,

specialists and allied health care providers need to be aware of their patients' expectations to be actively involved in the treatment of their back pain. It also highlights the need for GPs/allied health care professionals to be aware that clinical efficacy may not be an important factor for their back pain patient's choice of treatment in comparison to their desire to actively participate in the management of their back pain. The attitude that CAM is more natural than conventional medicine and is a holistic approach to health was important for those women self-prescribing vitamins/minerals, which indicates that over-the-counter CAM products may be perceived as natural. An important concern arises from the assumption that what is natural is also likely to be perceived as safe, which reflects the ways that CAM products are often advertised by popular media. Highlighting this topic reinforces the need for back pain care providers to enquire from their patients what CAM products they may be self-prescribing and for how long they have been taking self-prescribed CAM products.

The third primary finding presented in this thesis is that women were negatively influenced by GPs and positively influenced by non-professional sources of information (i.e. family/relatives, friends/colleagues, book/magazine) for consulting CAM practitioners (i.e. chiropractors, acupuncturists, herbalists/naturopaths, massage therapists, osteopaths) for a range of back pain related symptoms. As women's frequent visits to GPs were negatively associated with consulting CAM practitioners and positively associated with self-prescribing CAM treatments for back pain, these findings may indicate that women are not encouraged to consult CAM practitioners by GPs and may resort to self-prescribing CAM treatments in order to manage back pain-related problems, which are not resolved through conventional medical care. Women self-prescribing CAM raises concerns about possible risks associated with ill informed choices of self-prescribed CAM products. Further, with women being prepared to communicate with GPs about their CAM use, GPs have an opportunity to ask their patients about the reasons for their interest in consulting CAM practitioners and/or self-prescribing CAM treatments. It is also noteworthy that clinical evidence for CAM practitioner consultations did not feature as important for women in this study and yet the prevalence of women's consultations with CAM practitioners was high, suggesting that back pain sufferers' may take an active role in integrating various conventional and CAM approaches to managing their back pain.

The work presented in this thesis by employing an HSR approach helps contribute to the critical examination of CAM practitioner and self-prescribed CAM treatment/product use amongst female back pain sufferers aged 60-65 years. The findings of this study also add to the current knowledge about patterns of CAM use amongst middle-aged women for back pain and demonstrate considerable implications of CAM use in back pain care, especially within an Australian context.

8.6 Implications from the research

The research findings presented in this thesis have a number of implications for a range of stakeholders regarding use of CAM in back pain care, specifically: middle-aged women with back pain; back pain care providers; and health policy makers. This section focuses on exploring the implications of the research findings presented for each of these stakeholder groups.

8.6.1 Implications for middle-aged women with back pain

Back pain is more common amongst women than men with the highest prevalence of back pain amongst women aged 40 to 80 years (Hoy et al., 2012). As such, it can be expected that a substantial proportion of women in their middle-age (and older) are likely to experience back pain and be faced with the consequences of pain related symptoms that significantly restrict functional ability (Hoy et al., 2014). Although the literature shows that only a small percentage (10% of cases) of back pain have specific causes, with most cases of back pain being non-specific and self-limiting when acute, a substantial number of back pain sufferers experience persistent pain and disability despite receiving best practice treatments (Krismer & van Tulder, 2007). Therefore, mid-aged women with back pain may explore a range of treatment options beyond conventional medical and allied health care for the management of their back pain. The high prevalence of both consultations with CAM practitioners and self-prescribing CAM treatments found in this study highlights such active CAM seeking behaviour amongst Australian women. Considering that back pain may become persistent, relapsing or chronic and may incur associated symptoms as well as

functional disability, CAM may be a relevant option for several women for the management of their back pain. It is important however considering the multiplicity of CAM treatment options for back pain (each embedded in their own distinct philosophies and principles) that women with back pain seek appropriate information sources and communicate effectively with their health care providers about current and ongoing CAM use.

A key finding presented in this thesis relates to the high prevalence of self-prescribing CAM treatments including supplements, vitamins/minerals, herbal medicines and aromatherapy oils by women with back pain. Whilst some women with back pain may choose certain over-the-counter CAM products believing that they are more natural than conventional medicine, there are both direct and indirect risks involved in such self-prescription of CAM products. The direct risk relates to the risks arising from potential herb to drug, herb to herb, supplements to drug, supplements to herbs, herbs to vitamins/minerals interactions, especially if multiple forms of self-prescribed CAM products are consumed separately or along with conventional medicines. This implication reinforces the need for back pain sufferers to be conscious of the safety and risks associated with the self-prescription of CAM products, to wisely choose reliable information sources with regard to effectiveness of different CAM products in the management of back pain, and to openly communicate with their health care providers (whether conventional or complementary) about CAM products they are taking for the management of back pain and back pain related symptoms. Indirect risk refers to women's incorrect self-diagnosis and inappropriate treatment of back pain and back pain related symptoms/disability. Given that the high prevalence of self-prescribing CAM in this study was associated with frequent visits to GPs, it is likely that women are not receiving guidance from GPs on the use of CAM products in a substantial number of cases despite the majority of women in this study openly communicating to their GPs about self-prescribing CAM. It is therefore important for health care providers to make use of such opportunities during consultations for guiding their patients regarding making appropriate decisions on CAM product use. It is important that women with back pain actively seek advice from their back pain care providers regarding the use of self-prescribed CAM products to ensure coordinated and appropriate CAM use in the management of their back pain and related symptoms.

8.6.2 Implications for back pain care providers

The findings in this thesis have identified high use of CAM amongst female back pain sufferers aged 60-65 years. Such findings can assist conventional medical practitioners (i.e. GPs, specialists), allied health care professionals (i.e. physiotherapists, nurses, pharmacists) as well as CAM practitioners (i.e. acupuncturists, chiropractors, herbalists/naturopaths, yoga/meditation practitioners, osteopaths) to understand CAM use for back pain care in Australia. For example, consultations with acupuncturists and chiropractors were positively associated with women seeking help for headaches or leg pain related to back pain, consultations with herbalists/naturopaths were positively associated with women seeking help for neck pain, fatigue, anxiety/tension related to back pain, consultations with massage therapists were positively associated with women seeking help for neck pain, arm pain, stiffness, anxiety/tension related to back pain and consultations with osteopaths were positively associated with women seeking help for instability related to back pain. Conversely, consultations with chiropractors were negatively associated with women seeking help for sleeping problems and muscle spasms related to back pain, consultations with osteopaths were negatively associated with women seeking help for sleeping problems related to back pain and consultations with massage therapists were negatively associated with women seeking help for weakness related to back pain. As such, the findings shown in the thesis reveal the likelihood of specific CAM choices by middle-age female back pain sufferers, which can assist back pain care providers in identifying which CAM modalities are commonly chosen amongst their back pain patients. It is also important for back pain care providers to be aware of the effectiveness of CAM treatments when responding to their patients' needs.

The positive association between self-prescribing CAM treatments and frequent visits to GPs and/or specialists, and the negative association between frequent visits to GPs and consultations with CAM practitioners (shown in this study) highlights that conventional medical practitioners play an important role in back pain sufferers' decision to utilise CAM and in their selection of specific CAM treatments. Whilst some conventional medical practitioners may be reluctant to inform themselves about CAM, perhaps due to sparse clinical evidence on CAM (Wardle, J. J. L. & Adams, 2014), they need to be aware that despite their hesitance to learn about CAM, their patients with back pain may make their own decisions on self-prescribing CAM products.

Therefore, by conventional medical practitioners initiating communication about CAM use with their patients with back pain and by appraising their patients' choices of CAM, the risk of inappropriate CAM usage by back pain sufferers can be minimised. Since it is also known that some conventional medical practitioners are supportive of CAM (Frass et al., 2012) and refer their back pain patients to CAM practitioners (Charlie CL Xue et al., 2008; Easthope, G et al., 2000), it is vital that conventional medical practitioners take advantage of opportunities for updating themselves on CAM modalities for the treatment of back pain via attending workshops on CAM, communicating with CAM practitioners and their patients using CAM.

The findings presented in this thesis demonstrate that visits to nurses or physiotherapists were positively associated with self-prescribing yoga/meditation by women with back pain. As literature also shows that nurses and physiotherapists are supportive of yoga (Hughes, C. et al., 2011; Shorofi & Arbon, 2010), this may pose an opportunity for nurses and/or physiotherapists to update themselves on the role of yoga/meditation in back pain care and offer helpful advice regarding suitable integration of yoga/meditation practices in their patients' self-management of back pain. Similarly, the positive associations between physiotherapist visits and consultations with acupuncturists or massage therapists by back pain sufferers found in this study, as well as literature demonstrating physiotherapists' positive opinions about acupuncture and massage in back pain care (Hughes, C. et al., 2011), suggests that physiotherapists, acupuncturists and massage therapists are well positioned to collaborate and guide their back pain patients to appropriately integrate their respective modalities for effective back pain care.

A key finding in this thesis demonstrating a strong positive association between back pain sufferers' visits to pharmacists and prevalence of CAM consultations and/or self-prescribing CAM products, may highlight the influential role pharmacists play in back pain sufferers' decision-making on CAM use. Whilst literature shows that pharmacists are generally supportive of CAM products (Kanjanaarach, T et al., 2011; Naidu et al., 2005), it is also known that pharmacists have little training on CAM (Brown, J. et al., 2008) and this may pose risks as pharmacists may not be in a position to advise their customers with back pain adequately. Additionally, back pain sufferers may find talking to pharmacists easier than talking to their GP who can be accessed without appointments and further pharmacists' opinions on CAM treatments can be assumed

to be less biased than GPs' and/or CAM practitioners' opinions on CAM. It is essential that pharmacists gain knowledge on CAM treatments/products and potential interactions between CAM products and drugs to ensure that customers with back pain pursue safe care options.

Overall, conventional medical practitioners, allied health care professionals (especially nurses and pharmacists) need to initiate conversations with back pain sufferers about self-prescribed CAM products during routine medical visits, advise back pain sufferers to be cautious about polypharmacy (i.e. combining herbal medicines with pharmaceutical drugs or combining two or more types of herbal medicines), and refer back pain sufferers to a suitably qualified health professional (e.g. pharmacist, CAM practitioner) for preventing risks to safety. Meanwhile, conventional medical practitioners, allied health care professionals as well as CAM practitioners must actively engage in improving patient-practitioner communication in back pain care in order to provide safe treatment options in back pain care.

8.6.3 Implications for health policy makers

This is the first study that has examined in detail the use of CAM providers and provision amongst female back pain sufferers aged 60-65 years, by distinguishing CAM consultations and self-prescribed CAM treatments. This research demonstrates the high use of CAM by mid-age women with back pain and expands the investigation of CAM use in back pain care in the context of the Australian health system. The findings from this research have implications for future health policy development around CAM use.

Amongst the six most popular CAM practitioner groups consulted by Australian women for back pain in this study, with the exception of chiropractors, acupuncturists and osteopaths (who are nationally registered with the AHPRA), massage therapists, herbalists/naturopaths and yoga/meditation practitioners are voluntarily regulated and not registered with the AHPRA (Wardle, J. J. et al., 2014). Massage therapists and naturopaths are two of the largest CAM professions in Australia with 8,191 practitioners of massage therapy and 2,982 practitioners of naturopathy, according to

the Australian bureau of statistics census in the year 2006 (Leach, 2013). The absence of massage therapists and naturopaths/herbalists from the national registration may contribute to potentially unsafe provision of these therapies in back pain care to a substantial number of Australian women with back pain. In this context, policy makers should consider statutorily regulating massage therapists and naturopaths/herbalists to ensure safe provision of care for back pain sufferers in Australia. Although yoga is widely practiced as a form of exercise by individuals and groups usually facilitated by instructors, the application of yoga as a therapy is a recently emerging discipline in Australia with vaguely defined registration parameters and loosely regulated training standards (Penman, 2008). As a considerable proportion of women in this study reported consulting yoga/meditation practitioners for back pain, the absence of national registration for yoga therapists is concerning as this may pose potential risks of wrong diagnosis and unsafe back pain care provision. Therefore, it is important that policy makers in Australia consider registering yoga therapists and regulating the training and practice of yoga for back pain care.

Besides statutorily regulating CAM professions commonly consulted by back pain sufferers, it is essential to improve the communication between the various professional groups offering back pain care and to promote collaboration between conventional medical/allied health care providers and CAM providers. This is especially important as this study showed that female back pain sufferers are likely to use CAM alongside conventional and allied health care and communicate their CAM use to their back pain care providers. However, the study also found that visiting GPs and/or physiotherapists frequently was negatively associated with back pain sufferers' consultations with chiropractors. This finding serves as an example for the need to improve inter-professional communication for better coordinated back pain care delivery. Considering that there is some evidence that chiropractic may be helpful in back pain care (Globe et al., 2016), and also considering the negative association between conventional medical/allied health care professionals, this negative association, if due to professional discordance between these professional groups, might unduly prevent back pain sufferers from receiving adequate guidance on back pain management. Therefore, there appears to be a need for guidelines for back pain care providers to engage in effective inter-professional communication and inter-professional representation in order to facilitate safe and effective CAM choices by back pain sufferers seeking both conventional/allied health and CAM treatments.

8.7 Limitations of the research

This thesis presents the results of the largest nationally representative study on CAM use by female back pain sufferers aged 60-65 years in Australia, examining the use of both CAM practitioners and self-prescribed CAM in back pain care. Three limitations of this study should be acknowledged within the field of HSR and the study design.

8.7.1 Definition of complementary and alternative medicine

The research presented in this thesis examines the prevalence of CAM practitioner consultations and self-prescribed CAM treatments for back pain by women aged 60-65 years and associations between conventional health care utilisation, attitudes toward CAM, influential sources of information by including a selected number of CAM practitioner groups and self-prescribed CAM treatments, which may have led to underestimating the prevalence and patterns of CAM use. In addition, the questionnaire items did not enquire about the use of specific CAM products such as specific vitamins/minerals, supplements, herbal medicines and aromatherapy oils, which were popular amongst back pain sufferers in this study. Due to possible safety concerns arising from some these CAM products, future research must examine which vitamins/minerals, supplements, herbal medicines and aromatherapy oils back pain sufferers have used or were using. Further due to the diversity of CAM, there is a need to generalise the operational definition of CAM in back pain care in order to allow comparability of CAM surveys across time and across countries.

8.7.2 Selection bias

This research, by focusing on female back pain sufferers only, results in selection bias by excluding male back pain sufferers, thereby limiting the generalisability of the findings. Further, the women in this survey were aged 60-65 years. Back pain, although being more common amongst middle-aged women, occurs across all age groups and as such the findings of this study may not be representative of all women who use CAM. However, as this study utilised a nationally representative sample of Australian women, the results of this study provide important information regarding

patterns of consultations with CAM practitioners and self-prescribed CAM treatments by a noteworthy group of female back pain sufferers, provides information for back pain care providers, and identifies the current gaps of this topic for health policy makers.

8.7.3 Recall bias

The study involved participants self-reporting their use of CAM including health care utilisation, consultations with CAM practitioners, self-prescribing CAM treatments, information sources and communication about CAM use and therefore this may have influenced the study results due to potential recall bias. Literature on validity of self-reporting data on health care utilisation has shown that with increased frequency of visits to health care providers, there is a likelihood of under-reporting (Bhandari & Wagner, 2006). Further, accuracy of self-reporting is dependent on the socio-demographic determinants (e.g. education, age) and the questionnaire design (Bhandari & Wagner, 2006). In the study design of the research presented in this thesis, chances of recall bias have been reduced as the questionnaire asks about visits in terms of 'never, 1 or 2 times, more than 3 times' in the previous 12 months, which is manageable to recollect, especially considering that most of the participants had at least high school education and were at an age (60-65 years) where memory lapses are not necessarily an important issue. Besides, the participants in this survey could be expected to be familiar with the questionnaire format having participated at several previous surveys as part of the longitudinal study.

8.8 Strengths of the research

The research presented in this thesis is based on a cross-sectional survey, a sub-study of ALSWH and as such forms part of a highly renowned, well established and a rigorous longitudinal study in Australia. With a response rate of 80.9% from a population-based, nationally representative sample of mid-age women, this study provides opportunity to analyse a wide range of issues relating to CAM use in back pain. Whilst previous research from both longitudinal and cross-sectional studies has

examined the general use of CAM and has provided excellent insights into trends of overall CAM use, the strength of this research is the opportunity to analyse factors specifically associated with CAM consultations and self-prescribed CAM treatments amongst mid-age women with back pain via a well-designed study. The sample of this cross-sectional study was drawn from the large pool of participants at the sixth ALSWH survey (10,011 women had consented to participate in the longitudinal survey), of whom 1,851 women had indicated that they had experienced back pain and with 1,310 women completing the questionnaire survey, this study generated an adequate statistical power to elucidate statistical associations concerning CAM use. Further, a number of attitudes toward CAM, influential information sources, communication about CAM use, associations between CAM consultations/self-prescribing CAM and conventional/allied health care utilisation are collected in this study, allowing examination of broad-ranging factors linked to CAM use in back pain.

Overall, this study provides significant evidence of both CAM consultations and self-prescribed CAM use in back pain by mid-age women via a cross-sectional analysis. The significance of the findings shown in the study compensates for the above limitations.

8.9 Future research directions

This thesis identifies several topics for further research regarding issues relating to back pain care (especially amongst women aged 60 and above) as well as certain characteristics of study design helpful in advancing and improving further investigation into this particular area of women's healthcare. These issue and features are outlined in detail below.

While this thesis provides the first cross-sectional analyses of CAM use amongst female back pain sufferers from a large nationally representative sample of women aged 60-65 years, there remains much detail around CAM use for back pain, which requires further investigation. As this research has illustrated, female back pain sufferers consult CAM practitioner and self-prescribe CAM treatments alongside conventional medical and allied health care utilisation and it appears that women may

have concurrently pursued multiple approaches to back pain management. This topic needs further research attention by closely examining the reasons for choosing specific CAM modalities at specific stages of back pain care, notions of effectiveness of specific CAM for particular expectations of health outcomes in back pain care by CAM users and by exploring how back pain sufferers compare the effectiveness of various treatments they are pursuing. It is important to employ a nuanced research approach that recognises the heterogeneous nature of CAM practices and treatments (Adams, Jon, Sommers, Elizabeth, et al., 2013) as much can be gained from understanding the roles that different CAM modalities play in the management of back pain. While being cognisant of women's decision-making and integration of CAM in their back pain care, it is equally important to examine the role that conventional medical and allied health care professionals play in enabling or discouraging patients to seek help from specific CAM practitioner groups. It is important to examine in the future the roles of professional culture, referral patterns and attitudes of conventional medical and allied health care professionals with regard to back pain sufferers' use of CAM. While much research is available on conventional medical provider's opinions on CAM in general (Fadlon et al., 2008; Song, John & Dobs, 2007; Stange et al., 2008), there is little research, which has drawn upon fieldwork with conventional medical providers to directly investigate CAM use in back pain care. Such future research can offer further insights into the drivers of CAM use, opportunities and challenges for integrating CAM within the wider care of back pain sufferers.

This thesis highlights the need for a detailed, empirical and multi-disciplinary examination of the issues connected with self-prescribing CAM for back pain, since the prevalence of self-prescribing CAM was substantial in this study. In particular, the association between back pain sufferers' conventional medical utilisation and high prevalence of self-prescribing CAM products and association between frequent visits to pharmacists and high prevalence of self-prescribing CAM products deserves further enquiry to provide insights into health-seeking behaviour, decision-making, information seeking, and communication by back pain sufferers about self-prescribing CAM products. While previous research has focused primarily on GPs and nurses' attitudes toward CAM and to a lesser extent has examined pharmacists' attitudes toward CAM and knowledge about CAM (Naidu et al., 2005), very little is known

about the role that pharmacists play as an interface between back pain sufferers and decision-making on choosing self-prescribed CAM products and as such a detailed future investigation on this topic is paramount. Further, as noted in this thesis, women's attitudes toward CAM, in particular, CAM as a natural and holistic approach to health and CAM as giving more control over one's body/health are linked to self-prescribing CAM products. The drivers of back pain sufferers' self-prescribing CAM products/treatments as part of their self-care strategies in back pain are not yet fully understood and therefore need future research attention. CAM self-care in particular, has been noted as being characterised by individual choices (not involving guidance by health professionals) and self-prescribing CAM products may be an important aspect of CAM self-care, an area of research which has been identified by recent commentators as having been neglected by health services researchers (Adams, Kroll & Broom, 2014). Therefore, the topic of self-prescribing CAM products within the context of CAM self-care for back pain is a worthwhile topic needing future research attention to fully understand the motivations, decision-making and experiences by back pain sufferers. In order to explore the topic of back pain sufferers' self-prescribed CAM treatments, it is essential for future research to employ multi-disciplinary and multi-method study designs, especially qualitative design for closely examining the lived experience of back pain sufferers' navigation of the management of pain throughout the course of their illness. Also, future research should investigate the role of access to CAM practitioners/treatments as well as the impact of costs on back pain sufferers' decision-making about CAM use.

With a focus on back pain sufferers and conventional medical providers (principally GPs), future research should examine the influence communication between these stakeholders has on perceptions, attitudes and knowledge about the role of CAM (both consultations with CAM practitioner groups and self-prescribed CAM treatments) in back pain care. Such investigation is important, as despite knowledge that back pain sufferers communicate with their GPs about CAM use as found in this thesis, it is yet unknown and all the more important to understand what information GPs gain during such communication with their patients with back pain regarding CAM use and how GPs influence patients' decision-making regarding the use of CAM in back pain care. Also, further investigation is required to unpack and interpret the

interface between back pain sufferers and a range of back pain care providers including allied health care providers and CAM practitioner groups around integration of various CAM treatments and in particular, back pain sufferers' self-prescribed CAM use. As this future research suggestion indicates, there is a need to focus on the role of back pain care providers across conventional, allied health care and CAM professionals, who are key stakeholders in shaping back pain care besides the various approaches back pain sufferers themselves take in the management of their back pain. Lastly, the relationships and communication between conventional medical, allied health care and CAM professionals is a topic worthy of further research with regard to back pain care.

All these areas for future research noted above contribute to and are centred around furthering the HSR approach for examining CAM use amongst back pain sufferers. Meanwhile, the study presented in this thesis also indicate that mid-age women with back pain use a range of CAM despite the clinical evidence for CAM in back pain being lacking or inconclusive. Such high prevalence of CAM use as noted in this thesis highlights the disconnect between CAM use and evidence base for CAM in back pain care and therefore suggests the need for further clinical research including randomised controlled trials to supplement HSR and other disciplinary approaches. Therefore, this will help to increase the broad critical evidence-based approach to CAM in back pain care.

9 Conclusion

This thesis has applied a HSR approach to an examination of the consultations with six groups of CAM practitioners and the use of five types of self-prescribed CAM for back pain. The study has identified a number of significant findings.

Firstly, more than 75% of women participating in the study had consulted at least one of the six types of CAM practitioners and/or had self-prescribed at least one of the five types of CAM treatments for their back pain in the previous 12 months. The most popular CAM practitioner consultations for back pain were massage therapists followed by chiropractors, acupuncturists, herbalists or naturopaths, meditation or yoga practitioners and osteopaths. The frequency of self-prescribed CAM treatments for back pain was highest for supplements, followed by vitamins/minerals, yoga/meditation, herbal medicines and aromatherapy oils. Women's consultations with acupuncturists and massage therapists for back pain were positively associated with frequent visits to physiotherapists. Women's consultations with chiropractors for back pain were negatively associated with frequency of visits to GPs and/or physiotherapists. Women's consultations with massage therapists, yoga/meditation practitioners and osteopaths for back pain were positively associated with frequent visits to nurses. Women's consultations with herbalists/naturopaths, massage therapists and yoga/meditation practitioners for back pain were positively associated with frequent visits to pharmacists. On the other hand, women's overall use of self-prescribed CAM for back pain was positively associated with frequent visits to GPs/rheumatologists or pharmacists. In particular, women's self-prescribed use of herbal medicines, vitamins/minerals and/or supplements for back pain were positively associated with frequent visits to GPs and/or pharmacists. Women's self-prescribed use of yoga/meditation for back pain was positively associated with frequent visits to physiotherapists and/or nurses. Women's self-prescribed use of aromatherapy oils for back pain was positively associated with frequent visits to nurses and/or pharmacists.

Secondly, certain attitudes toward CAM held by women with back pain were influential in the decision-making regarding consultations with specific CAM practitioner groups and/or specific self-prescribed CAM treatments. There was a strong positive association between the attitude that 'CAM gives me more control over my health/body' and women consulting chiropractors and/or self-prescribing

supplements for their back pain. Women's attitudes that 'CAM is more natural than conventional medicine' and 'CAM promotes a holistic approach to health' were positively associated with self-prescribing vitamins/mineral for their back pain. Women's attitude that 'knowledge about evidence of CAM is important to me as a patient' was strongly associated with self-prescribing herbal medicines for their back pain.

Thirdly, women were influenced in their decision-making on consultations with CAM practitioners as well as self-prescribed CAM treatments for their back pain by both professional information sources (predominantly GPs or CAM practitioners) and non-professional information sources (predominantly friends/colleagues, family/relatives or partner). While non-professional information sources and CAM practitioners positively influenced back pain sufferers' decisions on consulting CAM practitioners (i.e. chiropractors, acupuncturists, herbalists/naturopaths, massage therapists, osteopaths) for a range of back-pain related symptoms (i.e. headaches/migraines, neck pain, leg pain/sciatica, weakness, stiffness, arm pain, fatigue, sleeping problems, pins and needles/numbness), GPs and allied health care professionals (e.g. nurses, pharmacists) negatively influenced back pain sufferers in their decisions to consult CAM practitioners for a range of back pain related symptoms.

Fourthly, the majority of women who consulted a GP as well as who used CAM for treating their back pain (through consultations with a CAM practitioner and/or self-prescribing CAM) felt comfortable talking to their GPs about their CAM use. Also, a majority of women who consulted a CAM practitioner for their back pain felt able to talk to their CAM practitioner about self-prescribed CAM use.

This thesis, in addition to presenting important findings as noted above, has identified several topics for future research relating to CAM use in back pain care. This research has provided novel insights into prevalence and patterns of CAM use by female back pain sufferers via an HSR approach. This study has additionally progressed the HSR approach by including both CAM practitioner consultations and self-prescribed CAM use by female back pain sufferers. The HSR approach has been validated by the substantial findings, which highlight the significant associations between consultations with conventional and allied health care professionals and both

consultations with a broad range of CAM practitioners and self-prescribed CAM. The CAM use identified amongst a large nationally representative sample of women aged between 60 and 65 years with back-pain reported in this thesis provides a sound basis on which to build further research

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11 Appendices

- Appendix 1 Survey 6: Australian Longitudinal Study on Women's Health. Sixth Survey of the mid-age cohort women.
- Appendix 2 Sub-study survey: Use of Alternative Medicine, Allied Health and General Practitioners for Back Pain Care Among Women of the 1946-1951 cohort.
- Appendix 3 Ethical approval letter
- Appendix 4 An integrative review of complementary and alternative medicine use for back pain: a focus on prevalence, reasons for use, influential factors, self-prescribed effectiveness, and communication.
- Appendix 5 Consultations with complementary and alternative medicine practitioners amongst wider care options for back pain: a study of a nationally representative sample of 1,310 Australian women aged 60-65 years.
- Appendix 6 Self-prescribed complementary and alternative medicine use for back pain amongst a range of care options: results from a nationally representative sample of 1310 women aged 60-65 years.
- Appendix 7 Back pain sufferers' attitudes toward consultations with CAM practitioners and self-prescribed CAM products: A study of a nationally representative sample of 1310 Australian women aged 60-65 years.
- Appendix 8 The influence of communication and information sources upon decision-making around complementary and alternative medicine use for back pain among Australian women aged 60-65 years.



women's health *a u s t r a l i a*



***Sixth survey for the women
of the 1946-51 cohort
2010***



How to complete this survey

*This is the sixth “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 30. 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:

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

Excellent ☐
Very good ☐
Good ☒
Fair ☐
Poor ☐

← You would mark this one if you think your health is good

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)

Do you go to the same place?

Always

Most of
the time

Some-
times

Rarely or
never

☐☒☐☐

↑ ↑
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 for you to talk to.

** If you feel distressed NOW and would like someone to talk to,
you could ring Lifeline on 131 114 (local call).*

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

■ *women's health* is about how you are feeling

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 now 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 questions on this page and the next one 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 both 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	☐	☐	☐	☐	☐

■ *women's health* is about using health services

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	Massage therapist	☐	☐
i	Naturopath / Herbalist	☐	☐
j	Chiropractor	☐	☐
k	Osteopath	☐	☐
l	Acupuncturist	☐	☐
m	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	Prayer or spiritual healing	☐	☐	☐	☐
g	Other alternative therapies	☐	☐	☐	☐

Q15 When you go to a General Practitioner:

(Mark one on each line)

		Always	Most of the time	Some-times	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 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 ☐

Q18a 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 ☐

Q18b 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 ☐

Q19 Have you been admitted to hospital in the LAST TWELVE MONTHS?

(Mark one only)

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

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 Have you EVER 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 <i>regular monthly</i> breast self examination?	☐	☐
c	Had a bone density test?	☐	☐
d	Had a test for bowel cancer?	☐	☐
e	Had a reminder from your general practice to have a screening test (eg blood pressure, cholesterol, blood sugar, skin)?	☐	☐

Q24 In the PAST THREE YEARS, have you received advice / information about lifestyle changes from any of these sources? (Mark one on each line)

		Yes	No
a	A doctor	☐	☐
b	A nurse	☐	☐
c	Other health professional (eg physiotherapist, naturopath)	☐	☐
d	Program or organisation (eg weight loss program, gym, self help group)	☐	☐
e	Books, magazines	☐	☐
f	The internet	☐	☐
g	Television	☐	☐
h	Radio	☐	☐
i	Family or friends	☐	☐
j	Private health fund	☐	☐

Q25 Are you CURRENTLY taking: (Mark one on each line)

		Yes	No
a	The oral contraceptive pill?	☐	☐
b	Hormone Replacement Therapy (HRT)?	☐	☐

Q26 Have you: (Mark one on each line)

		Yes	No
a	Had a hysterectomy?	☐	☐
b	Had a period or menstrual bleeding in the last 12 months?	☐	☐
c	Had a period or menstrual bleeding in the last 3 months?	☐	☐

Q27 Compared with twelve months ago, are your periods: (Mark one only)

- Less frequent ☐
- About the same ☐
- More frequent ☐
- Changeable ☐

Q28 If you have reached menopause, at what age did your periods completely stop?

(Please write the age in the box)

years

Not applicable ☐

Q29 Have you ever had Gestational Diabetes (diabetes during pregnancy)?

(Mark one only)

Yes ☐

No ☐

Q30 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	☐	☐	☐	☐	☐	☐

Q31 In the LAST TWELVE MONTHS have you consulted a dentist? (Mark one only)

No, I did not need to see a dentist ☐

No, because there was no dentist available locally ☐

No, I could not get there because of travel difficulties ☐

No, because it would cost more than I could afford ☐

No, I did not go to the dentist because of another reason ☐

Yes, I saw a dentist ☐

Q32 How would you rate the overall condition of your teeth, dentures or gums?

(Mark one only)

Excellent ☐

Very good ☐

Good ☐

Fair ☐

Poor ☐

Q33 There are 16 teeth, including wisdom teeth, in the upper jaw. How many teeth do you have remaining in your UPPER jaw?

(Please write number in boxes)

Q34 There are 16 teeth, including wisdom teeth, in the lower jaw. How many teeth do you have remaining in your LOWER jaw?

(Please write number in boxes)

Q35 Do you wear a denture or false teeth in your upper jaw? (Mark one only)

Yes ☐

No ☐

Q36 Do you wear a denture or false teeth in your lower jaw? (Mark one only)

Yes ☐

No ☐

Q37 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 ☐

Q38 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 Osteoarthritis ☐

d Rheumatoid arthritis ☐

e Other arthritis ☐

f Heart disease (*including heart attack, angina*) ☐

g Thrombosis (*a blood clot*) ☐

h Hypertension (*high blood pressure*) ☐

i Stroke ☐

j Low iron level (*iron deficiency or anaemia*) ☐

k Asthma ☐

l Bronchitis / emphysema ☐

m Osteoporosis ☐

n Breast cancer ☐

o Cervical cancer ☐

p Skin cancer (*including melanoma*) ☐

q Other cancer (*please specify on page 30*) ☐

r Depression ☐

s Anxiety / nervous disorder ☐

t Other psychiatric disorder ☐

u Chronic Fatigue Syndrome ☐

v Sexually transmitted infection (*eg genital herpes or warts, chlamydia*) ☐

w Other major illness or disability (*please specify on page 30*) ☐

x None of these conditions ☐

Q39 Compared to when you were in your twenties, how good are you at:

(Mark one on each line)

		Much better now	Somewhat better now	About the same	Somewhat worse now	Much worse now
a	Remembering the name of a person just introduced to you?	☐	☐	☐	☐	☐
b	Recalling telephone numbers or other numbers that you use on a daily or weekly basis?	☐	☐	☐	☐	☐
c	Recalling where you put objects (<i>such as keys</i>) in your home?	☐	☐	☐	☐	☐
d	Remembering specific facts from a newspaper or magazine article you have just finished reading?	☐	☐	☐	☐	☐
e	Remembering the item(s) you intend to buy when you arrive at the shops?	☐	☐	☐	☐	☐
f	In general, how would you describe your memory compared to when you were in your twenties?	☐	☐	☐	☐	☐

Q40 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	Repair of prolapsed vagina, bladder or bowel	☐
c	Endometrial ablation (<i>removal of the lining of the uterus</i>)	☐
d	Joint replacement (<i>eg hip, knee</i>)	☐
e	Mastectomy (<i>removal of one or both breasts</i>)	☐
f	Lumpectomy (<i>removal of lump from breast</i>)	☐
g	Removal of skin cancer	☐
h	Any cancer surgery (<i>other than skin or breast</i>)	☐
i	Chemotherapy or radiotherapy for any cancer	☐
j	Breast biopsy (<i>taking a sample of breast tissue</i>)	☐
k	Hysteroscopy (<i>investigative procedure to examine the uterus</i>)	☐
l	Cholecystectomy (<i>gall bladder removed</i>)	☐
m	Gastroscopy / colonoscopy	☐
n	None of these	☐

Q41 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 | ☐ |

Q42 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? | ☐ | ☐ |

If No to both, go to Q44

Q43 Please write down the names of all your medications, vitamins, supplements or herbal therapies taken in the PAST FOUR WEEKS. Where possible, copy names from the packets.

(Please write in block letters)

a		i	
b		j	
c		k	
d		l	
e		m	
f		n	
g		o	
h		p	

Q44 In the PAST WEEK, have you been feeling that life isn't worth living? (Mark one only)

Yes ☐

No ☐

Q45 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 131114 (local call).

Q46 In the **LAST 12 MONTHS**, have you had any of the following:

(Mark one on each line in column A.

For all that apply also answer column B.)

		A				B
		Never	Rarely	Some- times	Often	For the problems you had, DID you seek help? Mark here if you DID seek help
a	Allergies, hay fever, sinusitis	☐	☐	☐	☐	☐
b	Breathing difficulty	☐	☐	☐	☐	☐
c	Indigestion / heartburn	☐	☐	☐	☐	☐
d	Chest pain	☐	☐	☐	☐	☐
e	Headaches / migraines	☐	☐	☐	☐	☐
f	Severe tiredness	☐	☐	☐	☐	☐
g	Stiff or painful joints	☐	☐	☐	☐	☐
h	Back pain	☐	☐	☐	☐	☐
i	Urine that burns or stings	☐	☐	☐	☐	☐
j	Haemorrhoids (<i>piles</i>)	☐	☐	☐	☐	☐
k	Other bowel problems	☐	☐	☐	☐	☐
l	Vaginal discharge or irritation	☐	☐	☐	☐	☐
m	Hot flushes	☐	☐	☐	☐	☐
n	Night sweats	☐	☐	☐	☐	☐
o	Eyesight problems	☐	☐	☐	☐	☐
p	Leaking urine	☐	☐	☐	☐	☐
q	Mouth, teeth or gum problems	☐	☐	☐	☐	☐
r	Avoided eating some foods because of problems with your teeth, mouth or dentures	☐	☐	☐	☐	☐
s	Toothache	☐	☐	☐	☐	☐
t	Hearing problems	☐	☐	☐	☐	☐
u	Depression	☐	☐	☐	☐	☐
v	Anxiety	☐	☐	☐	☐	☐
w	Episodes of intense anxiety (<i>eg panic attacks</i>)	☐	☐	☐	☐	☐
x	Palpitations (<i>feeling that your heart is racing or fluttering in your chest</i>)	☐	☐	☐	☐	☐
y	Poor memory	☐	☐	☐	☐	☐
z	Dizziness, loss of balance	☐	☐	☐	☐	☐
aa	Difficulty concentrating	☐	☐	☐	☐	☐

women's health *is about coping with stress*

Q47 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
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 children	☐	☐	☐	☐	☐	☐
j	Relationship with other family members	☐	☐	☐	☐	☐	☐

Q48 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	☐	☐	☐	☐	☐	☐

Q49 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	☐	☐	☐	☐	☐

Q50 What is your postcode?

a What is your RESIDENTIAL postcode?
(where you live)

--	--	--	--

b What is the postcode of your POSTAL ADDRESS?
(if different from residential)

--	--	--	--

Q51 Which of the following events have you experienced?

(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 or involvement in a serious accident	☐	☐
c	Major personal achievement	☐	☐
d	Birth of a grandchild	☐	☐
e	Major surgery (<i>not including dental work</i>)	☐	☐
f	Going through menopause	☐	☐
g	Major decline in health of spouse or partner	☐	☐
h	Major decline in health of other close family member or close friend	☐	☐
i	Starting a new, close personal relationship	☐	☐
j	Infidelity of spouse or partner	☐	☐
k	Break-up of a close personal relationship	☐	☐
l	Divorce	☐	☐
m	Major conflict with teenage or older children	☐	☐
n	Child or other family member leaving home (<i>due to marriage, to attend university etc</i>)	☐	☐
o	Death of spouse or partner	☐	☐
p	Death of a child	☐	☐
q	Death of other close family member	☐	☐
r	Death of close friend	☐	☐
s	Changing your type of work / hours / conditions / responsibilities at work	☐	☐
t	Retirement	☐	☐
u	Your spouse or partner retiring from work	☐	☐
v	Being made redundant	☐	☐
w	Your spouse / partner being made redundant	☐	☐
x	Decreased income	☐	☐
y	Moving house	☐	☐
z	Natural disaster (<i>fire, flood, drought, earthquake etc</i>) or house fire	☐	☐
aa	Major loss or damage to personal property	☐	☐
bb	Being robbed	☐	☐
cc	Being pushed, grabbed, shoved, kicked or hit	☐	☐
dd	Being forced to take part in unwanted sexual activity	☐	☐
ee	Legal troubles or involved in a court case	☐	☐
ff	Family member / close friend being arrested / in gaol	☐	☐
gg	You or a family member involved in problem gambling	☐	☐
hh	None of these events		☐

Q52 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	☐	☐	☐	☐

Q53 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?	☐	☐

Q54 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 ☐

The following sections are about other health habits, time use and your relationships.

Often there are no "right" or "wrong" answers – we are interested only in your opinion or feelings.

If you feel uncomfortable about answering a question, just leave it and go on to the next one, but please try to finish the survey if you can.

You may like to take a break now and do the second part later.

■ *women's health* is about healthy weight and shape

Q55 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

Q56 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

Q57 In the LAST THREE YEARS, have you:

(Mark one on each line)

		Yes	No
a	Lost 5 kg or more on purpose?	☐	☐
b	Lost 5 kg or more for any other reason?	☐	☐
c	Gained 5 kg or more?	☐	☐

Q58 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	☐	☐

Q59 Have you ever had gastric banding surgery? (Mark one only)

- Yes, in the last 3 years ☐
- Yes, more than 3 years ago ☐
- Never ☐

Q60 How often do you usually drink alcohol?

(Mark one only)

- I have never drunk alcohol in my life ☐
- I never drink alcohol, but I have in the past ☐
- 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 ☐

Go to
Q63

Q61 On a day when you drink alcohol, how many 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 ☐

Q62 How often do you have five or more 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 ☐

**Q63 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 ☐

This section is about your **usual** eating habits over the **LAST TWELVE 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).

Q64 How many pieces of FRESH fruit do you usually eat per day?

(Count ½ cup 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 pieces of fruit per day ☐
- 5 or more pieces of fruit per day ☐

Q65 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 ☐

Q66 How many SERVES of vegetables do you usually eat each day?

(A serve = half a cup of cooked vegetables or a cup of salad vegetables)

- None ☐
- 1 serve ☐
- 2 serves ☐
- 3 serves ☐
- 4 serves ☐
- 5 serves or more ☐

Q67 What type of milk do you usually use?

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

Q68 How much milk do you usually use per day?

(Include flavoured milk and milk added to tea, coffee, cereal etc)

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

Q69 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 ☐

Q70 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 ☐

Q71 Which spread do you usually put on bread?

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

Q72 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 ☐

Q73 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 ☐

Q74a Over the LAST 12 MONTHS, on average, how often did you eat the following foods?

(Mark one on each line)

		Never	Less than once a week	Once a week or more
a	All-Bran™	☐	☐	☐
b	Sultana Bran™, Fibre Plus™, Branflakes™	☐	☐	☐
c	Weet Bix™, Vita Brits™, Weeties™	☐	☐	☐
d	Cornflakes, Nutrigrain™, Special K™	☐	☐	☐
e	Porridge	☐	☐	☐
f	Muesli	☐	☐	☐
g	Rice	☐	☐	☐
h	Pasta or noodles (<i>include lasagne</i>)	☐	☐	☐
i	Nuts	☐	☐	☐
j	Peanut butter or peanut paste	☐	☐	☐
k	Vegemite™, Marmite™, Promite™	☐	☐	☐
l	Tinned or frozen fruit (<i>any kind</i>)	☐	☐	☐
m	Oranges or other citrus fruit	☐	☐	☐
n	Apples	☐	☐	☐
o	Pears	☐	☐	☐
p	Bananas	☐	☐	☐
q	Watermelon, rockmelon, honeydew etc	☐	☐	☐
r	Pineapple	☐	☐	☐
s	Strawberries	☐	☐	☐
t	Apricots	☐	☐	☐
u	Peaches or nectarines	☐	☐	☐
v	Mango or paw paw	☐	☐	☐
w	Avocado	☐	☐	☐
x	Fruit or vegetable juice	☐	☐	☐
y	Potatoes cooked without fat	☐	☐	☐
z	Tomato sauce, tomato paste or dried tomatoes	☐	☐	☐
aa	Fresh or tinned tomatoes	☐	☐	☐
bb	Peppers (<i>capsicum</i>)	☐	☐	☐
cc	Lettuce, endive or other salad greens	☐	☐	☐
dd	Cucumber	☐	☐	☐
ee	Celery	☐	☐	☐
ff	Beetroot	☐	☐	☐
gg	Carrots	☐	☐	☐
hh	Cabbage or Brussels sprouts	☐	☐	☐
ii	Cauliflower	☐	☐	☐
jj	Broccoli	☐	☐	☐
kk	Silverbeet or spinach	☐	☐	☐
ll	Peas	☐	☐	☐
mm	Green beans	☐	☐	☐



		Never	Less than once a week	Once a week or more
nn	Bean sprouts or alfalfa sprouts	☐	☐	☐
oo	Baked beans	☐	☐	☐
pp	Soya beans, soy bean curd or tofu	☐	☐	☐
qq	Other beans (<i>include chick peas, lentils etc</i>)	☐	☐	☐
rr	Pumpkin	☐	☐	☐
ss	Onions or leeks	☐	☐	☐
tt	Garlic (<i>not garlic tablets</i>)	☐	☐	☐
uu	Mushrooms	☐	☐	☐
vv	Zucchini	☐	☐	☐

Q74b Over the LAST 12 MONTHS, on average, how often did you eat the following foods?

(Mark one on each line)

		Never	Less than once a week	Once a week	2-4 times per week	5 or more times per week
a	Cheese	☐	☐	☐	☐	☐
b	Ice cream	☐	☐	☐	☐	☐
c	Yoghurt	☐	☐	☐	☐	☐
d	Beef	☐	☐	☐	☐	☐
e	Veal	☐	☐	☐	☐	☐
f	Chicken	☐	☐	☐	☐	☐
g	Lamb	☐	☐	☐	☐	☐
h	Pork	☐	☐	☐	☐	☐
i	Fish, steamed, grilled or baked	☐	☐	☐	☐	☐
j	Fish, tinned (<i>salmon, tuna, sardines etc</i>)	☐	☐	☐	☐	☐

Q75 How often do you currently smoke cigarettes or any tobacco products?

(Mark one only)

Daily	☐	Go to Q76
At least weekly (<i>but not daily</i>)	☐	Go to Q77
Less often than weekly	☐	Go to Q78
Not at all	☐	

Q76 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 Q80
----------------------	----------------------	----------------------	--------------------	-----------

Q77 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
----------------------	----------------------	----------------------	---------------------

Q78 Have you ever smoked DAILY?

(Mark one only)

Yes	☐	
No	☐	If No, go to Q80

Q79 At what age did you finally stop smoking DAILY?

PRINT age in the box

		years old
----------------------	----------------------	-----------



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.

Q80 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.

Q81 How many *times* 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

Q82 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
--	--	-------	--	--	---------

Q83 During the last three years, how often did you have sex? (Mark one only)

- Did not have sex ☐
- Once a month or less ☐
- Two to three times a month ☐
- At least once a week ☐

women's health is about how you spend your time

Q84 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	☐	☐	☐	☐	☐	☐	☐

Q85 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?	☐	☐	☐	☐	☐

Q86 Are you happy with your share of the following tasks and activities?

(Mark one on each line)

		Happy the way it is	Would like other household members to do more	Would prefer another arrangement	Not applicable (don't do this)
a	Domestic work (shopping, cooking, cleaning etc)	☐	☐	☐	☐
b	Childcare	☐	☐	☐	☐
c	Caring for another adult (who is elderly / disabled / sick)	☐	☐	☐	☐
d	Other household work (gardening, home / car maintenance)	☐	☐	☐	☐

Q87 Do you regularly provide (unpaid) care for grandchildren or other people's children?

(Mark one only)

Yes, daily	☐
Yes, weekly	☐
Yes, occasionally	☐
No, never	☐

Q88 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	☐	☐
b	For someone who lives elsewhere	☐	☐

If No to both, go to Q92

Q89 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 ☐

Q90 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 ☐

Q91 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 ☐

Q92 Do you normally do any of the following kinds of paid work?
(Mark all that apply)

	Yes
a Paid shift work	☐
b Paid work at night	☐
c Paid work from home	☐
d Self employment	☐
e Paid work in more than one job	☐
f Casual paid work	☐
g Paid work involving none of the above	☐
h I don't do any paid work	☐

For the following questions, WORK is defined as any paid work, unpaid voluntary work or work without pay (eg family business).

Q93 In a seven day week, on how many DAYS would you say you are AT WORK (paid or unpaid)?

--	--

Number of days

Q94 On average, on days when you are AT WORK (paid or unpaid), how many hours per day do you work?

		hours
--	--	-------

		minutes
--	--	---------

Q95 Please estimate how much time you spent **SITTING** in each of the following activities on your last **WORK** day and on your last **NON-WORK** day (*weekend day or day off*).

		WORK DAY		NON-WORK DAY	
		hours	minutes	hours	minutes
a	For TRANSPORT (eg in a car, bus, train etc, but NOT on a bike)				
b	At WORK (eg sitting at a desk or using a computer)				
c	Watching TV				
d	Using a computer at home (email, games, information, chatting)				
e	Other leisure activities (socializing, movies etc, but NOT including TV or computer use)				

Q96 How much time did you spend **SLEEPING** on each of these days?

WORK DAY		NON-WORK DAY	
hours	minutes	hours	minutes

Q97 Was this a usual work day / non-work day?
(Please mark Yes or No for work day and non-work day)

WORK DAY		NON-WORK DAY	
Yes	No	Yes	No
☐	☐	☐	☐

Q98 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		☐

Q99 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 ☐

Q100 Are there people who do NOT live with you who are dependent on your household income?

(Mark one only)

- No ☐
- Yes, one ☐
- Yes, more than one ☐

Q101 Women's employment patterns have changed a lot over recent years. We are keen to learn how women see retirement in their own lives. Please indicate the following description that best fits your life now. If you want to add more please write this on page 30.

(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 ☐

Q102 When did you retire or give up work completely?

(Print year in the box)

Not applicable

☐

Q103 At what age do you expect to retire (completely) from the paid workforce?

(Print age, in whole years, in the box)

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

Q104 You have said when you expect to retire, but if you had the choice, at what age would you like to retire (completely) from the paid workforce?

(Print age, in whole years, in the box)

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

Q105 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 (<i>such as shares and property</i>)	☐
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	☐

Q106 When you are OVER 65 what will be your 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 (<i>such as shares and property</i>)	☐
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	☐

Q107 When you are 65 how do you expect to manage on your available income?*(Mark one only)*

- It will be impossible ☐
- It will be difficult all of the time ☐
- It will be difficult some of the time ☐
- It will not be too bad ☐
- It will be easy ☐

Q108 What is the highest qualification you have completed?*(Mark one only)*

- No formal qualifications ☐
- School or Intermediate Certificate (*or equivalent*) ☐
- High School or Leaving Certificate (*or equivalent*) ☐
- Trade / apprenticeship (*eg Hairdresser, Chef*) ☐
- Certificate / diploma (*eg Child care, Technician*) ☐
- University degree ☐
- Higher University degree (*eg Grad Dip, Masters, PhD*) ☐

women's health *is about you and your life*

Q109 These questions are about getting on with other people:

(Mark one on each line)

		Yes	No
a	Are you sad or lonely often?	☐	☐
b	Do you feel uncomfortable with anyone in your family?	☐	☐
c	Can you take your own medication and get around by yourself?	☐	☐
d	Do you feel that nobody wants you around?	☐	☐
e	Does someone in your family make you stay in bed or tell you you're sick when you know you are not?	☐	☐
f	Has anyone forced you to do things you didn't want to do?	☐	☐
g	Has anyone taken things that belong to you without your OK?	☐	☐
h	Do you trust most of the people in your family?	☐	☐
i	Do you have enough privacy at home?	☐	☐
j	Has anyone close to you tried to hurt or harm you recently?	☐	☐
k	Has anyone close to you called you names or put you down or made you feel bad recently?	☐	☐
l	Are you afraid of anyone in your family?	☐	☐
m	Does anyone in your family drink a lot of alcohol?	☐	☐
n	Have you ever been in a violent relationship with a partner / spouse?	☐	☐

Q110 What is your present marital status? (Mark one only)

Married (<i>registered</i>)	☐
De facto relationship (<i>opposite sex</i>)	☐
De facto relationship (<i>same sex</i>)	☐
Separated	☐
Divorced	☐
Widowed	☐
Never married	☐

Q111 How many people live with you now? (Mark all that apply)

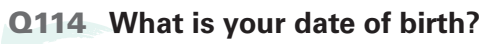
a	No one, I live alone	☐		
b	Partner or spouse	☐		
		One	Two	Three or more
c	Children under 16 years	☐	☐	☐
d	Children 16-18 years	☐	☐	☐
e	Children over 18 years	☐	☐	☐
f	Your parents or in-laws	☐	☐	☐
g	Other adult relatives	☐	☐	☐
h	Other adults (<i>not family members</i>)	☐	☐	☐

Q112 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	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	☐	☐	☐	☐	☐

Q113 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	☐	☐	☐	☐



Day

Month

Year

Q115 Did someone help you fill in this survey? (Mark one only)

No

1

Yes, but I told them the answers I wanted

Yes, but the helper answered for me using his / her own judgement

Q116 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.

Yes → ☐ No → ☐

Signature _____ **Date** ____/____/____



Help us keep in touch

□

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()

--	--	--	--	--	--	--	--

*Thank you for taking the time
to complete this survey.*

*If you have any questions you can contact us
by telephoning*

1800 068 081 (freecall).

*Don't forget to sign the consent
and post this back to us!*



women's
health
a u s t r a l i a



**Sixth survey for the women of the
1946-51 cohort
2010**



*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.alsw.org.au



**THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA**

women's health *a u s t r a l i a*



*Use of Alternative Medicine,
Allied Health and General Practitioners
for Back Pain Care Among Women of
the 1946 – 1951 Cohort*

2011

**This survey is for women who have experienced back pain.
If this does not apply to you, please cross the box below and
return the survey in the reply paid envelope enclosed.**

This survey does not apply to me → ☐

Lead investigator:

Associate Professor Alex Broom
School of Social Sciences
The University of Queensland
St Lucia QLD 4072
Australia
Phone: +61-7-3365 2022
Email: a.broom@uq.edu.au

How to complete this survey

This is a survey about use of alternative medicine, allied health, and general practice. Some of the questions are the same as those in the main surveys you have completed in earlier years.

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 each question for the time period indicated in the question.

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:

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

Excellent	☐
Very good	☐
Good	☒
Fair	☐
Poor	☐

You would mark this one if you think your health is good.

▪ 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	Sometimes	Rarely or never
Do you go to the same place?	☐	☒	☒	☐

If you make a mistake, simply scribble it out and mark the correct answer with a circle or arrow

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).

Q1 How long have you had back pain? (Please specify number of years / months)

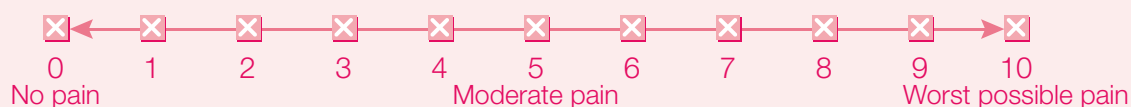
years

months

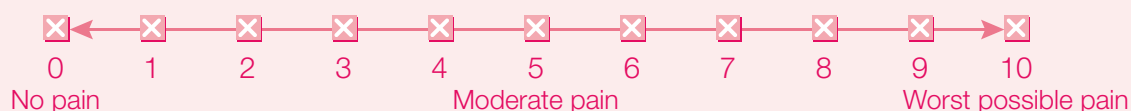
Q2 Please describe how often you experience back pain. (Mark one only)

- Never ☐
- Rarely ☐
- Intermittently ☐
- Regularly ☐
- Continuously ☐

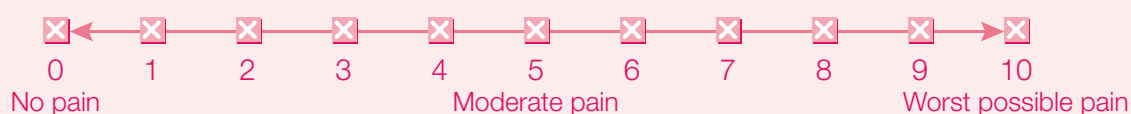
Q3 Please rate the intensity of your typical back pain in the past 12 months. (Mark one only)



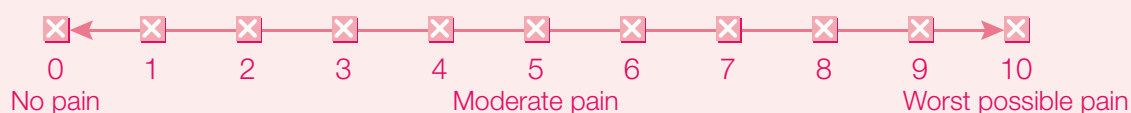
Q4 Please rate the intensity of your worst back pain in the past 12 months. (Mark one only)



Q5 Please rate the intensity of your back pain at its best in the past 12 months. (Mark one only)



Q6 Please identify the number at which your back pain is at an acceptable level. (Mark one only)



Q7 How many times have you consulted the following alternative health practitioners for back pain during the past 12 months? (Mark one on each line)

	None	1 or 2	3 or 4	5 or 6	7 or more
a Acupuncturist	☐	☐	☐	☐	☐
b Aromatherapist	☐	☐	☐	☐	☐
c Craniosacral Therapist	☐	☐	☐	☐	☐
d Chiropractor	☐	☐	☐	☐	☐
e Herbalist / Naturopath	☐	☐	☐	☐	☐
f Massage Therapist	☐	☐	☐	☐	☐
g Meditation / Yoga	☐	☐	☐	☐	☐
h Osteopath	☐	☐	☐	☐	☐
i Reflexologist	☐	☐	☐	☐	☐
j Reiki Therapist	☐	☐	☐	☐	☐
k Traditional Chinese Medicine Practitioner	☐	☐	☐	☐	☐
l Other (please specify)	☐	☐	☐	☐	☐

Q8 If you did consult with any of the alternative health practitioners listed in Q7 for your back pain, how much did it cost you in total for these consultations during the past 12 months? *(Mark one only)*

Less than \$100	☐
\$100 – \$499	☐
\$500 – \$999	☐
\$1,000 – \$1,499	☐
\$1,500 or above	☐

Q9 How many times have you consulted the following allied health practitioners for back pain during the past 12 months? *(Mark one on each line)*

	None	1 or 2	3 or 4	5 or 6	7 or more
a Physiotherapist	☐	☐	☐	☐	☐
b Occupational Therapist	☐	☐	☐	☐	☐
c Nurse	☐	☐	☐	☐	☐
d Pharmacist	☐	☐	☐	☐	☐
e Other <i>(please specify)</i>	☐	☐	☐	☐	☐
-----	☐	☐	☐	☐	☐

Q10 If you did consult with any of the allied health practitioners listed in Q9 for your back pain, how much did it cost you in total for these consultations during the past 12 months? *(Mark one only)*

Less than \$100	☐
\$100 – \$499	☐
\$500 – \$999	☐
\$1,000 – \$1,499	☐
\$1,500 or above	☐

Q11 How many times have you consulted the following medical practitioners for back pain during the past 12 months? *(Mark one on each line)*

	None	1 or 2	3 or 4	5 or 6	7 or more
a General Practitioner	☐	☐	☐	☐	☐
b Orthopaedic Specialist	☐	☐	☐	☐	☐
c Neurologist	☐	☐	☐	☐	☐
d Rheumatologist	☐	☐	☐	☐	☐
e Other <i>(please specify)</i>	☐	☐	☐	☐	☐
-----	☐	☐	☐	☐	☐

Q12 If you did consult with any of the medical practitioners listed in Q11 for your back pain, how much did it cost you in total for these consultations during the past 12 months? *(Mark one only)*

Less than \$100	☐
\$100 – \$499	☐
\$500 – \$999	☐
\$1,000 – \$1,499	☐
\$1,500 or above	☐

Q13 How many times have you taken the following self-prescribed treatments for back pain during the past 12 months? (Mark one on each line)

	None	1 or 2	3 or 4	5 or 6	7 or more
a Herbal medicines	☒	☒	☒	☒	☒
b Painkillers (eg Panadol, Nurofen)	☒	☒	☒	☒	☒
c Vitamins / Minerals (eg magnesium)	☒	☒	☒	☒	☒
d Supplements (eg glucosamine, fish oils)	☒	☒	☒	☒	☒
e Meditation or Yoga	☒	☒	☒	☒	☒
f Aromatherapy oils	☒	☒	☒	☒	☒
g Chinese medicine	☒	☒	☒	☒	☒
h Self prayer	☒	☒	☒	☒	☒
i Other alternative therapies (please specify)	☒	☒	☒	☒	☒
-----	☒	☒	☒	☒	☒

Q14 If you did take any of the self-prescribed treatments listed in Q13 for your back pain, how much did it cost you in total for these treatments during the past 12 months? (Mark one only)

Less than \$100	☒
\$100 – \$499	☒
\$500 – \$999	☒
\$1,000 – \$1,499	☒
\$1,500 or above	☒

Q15 In which order did you consult practitioners for your back pain? (Mark all that apply)

	1st	2nd	3rd	4th	5th	6th	7th	8th
a GP	☒	☒	☒	☒	☒	☒	☒	☒
b Specialist	☒	☒	☒	☒	☒	☒	☒	☒
c Pharmacist	☒	☒	☒	☒	☒	☒	☒	☒
d Chiropractor	☒	☒	☒	☒	☒	☒	☒	☒
e Acupuncturist	☒	☒	☒	☒	☒	☒	☒	☒
f Herbalist / Naturopath	☒	☒	☒	☒	☒	☒	☒	☒
g Physiotherapist	☒	☒	☒	☒	☒	☒	☒	☒
h Massage Therapist	☒	☒	☒	☒	☒	☒	☒	☒
i Osteopath	☒	☒	☒	☒	☒	☒	☒	☒
j Self-prescribed alternative medicine	☒	☒	☒	☒	☒	☒	☒	☒
k Other (please specify)	☒	☒	☒	☒	☒	☒	☒	☒
-----	☒	☒	☒	☒	☒	☒	☒	☒
l Did not seek help	☒							

Q16 For how long did you have back pain before seeking help from a conventional health care practitioner (eg GP, physiotherapist, occupational therapist)? (Mark one only)

Sought help immediately	☒
Less than a month	☒
1-5 months	☒
6-12 months	☒
More than 12 months	☒
Did not seek help	☒

Q17 For how long did you have back pain before seeking help from an alternative medicine practitioner? (Mark one only)

- Sought help immediately ☒
- Less than a month ☒
- 1 – 5 months ☒
- 6 – 12 months ☒
- More than 12 months ☒
- Did not seek help ☒

Q18 For how long did you have back pain before using self-prescribed alternative medicine? (Mark one only)

- Sought help immediately ☒
- Less than a month ☒
- 1 – 5 months ☒
- 6 – 12 months ☒
- More than 12 months ☒
- Did not self-prescribe ☒

Q19 Which of the following reasons were important in your decision to consult the practitioner(s)? (Mark all that apply)

	GP / Specialist	Chiro- practor	Acupunct- urist	Herbalist / Naturopath	Physio- therapist	Massage Therapist	Osteopath
a Pain relief	☒	☒	☒	☒	☒	☒	☒
b To improve mobility	☒	☒	☒	☒	☒	☒	☒
c To improve function	☒	☒	☒	☒	☒	☒	☒
d Relaxation / stress relief	☒	☒	☒	☒	☒	☒	☒
e General wellbeing	☒	☒	☒	☒	☒	☒	☒
f Other (<i>please specify</i>)	☒	☒	☒	☒	☒	☒	☒
-----	☒	☒	☒	☒	☒	☒	☒

Q20 Which of the following information sources have been influential in your decision to use alternative medicine for your back pain? (Mark one on each line)

	No influence at all	Of little influence	Moderately influential	Influential	Very influential
a Family or relatives	☒	☒	☒	☒	☒
b Partner	☒	☒	☒	☒	☒
c Friends or colleagues	☒	☒	☒	☒	☒
d Internet	☒	☒	☒	☒	☒
e Book or magazine	☒	☒	☒	☒	☒
f Mass media (eg newspaper, TV, radio)	☒	☒	☒	☒	☒
g Doctor	☒	☒	☒	☒	☒
h Pharmacist	☒	☒	☒	☒	☒
i Allied health worker (eg nurse)	☒	☒	☒	☒	☒
j Alternative health practitioner	☒	☒	☒	☒	☒

If you DID NOT USE alternative medicine for your back pain, please go to Question 26.

Q21 If you did use alternative medicine, did you consult your doctor before using these medicines for your back pain? (Mark one only)

- | | |
|-----------|--------------------------|
| Always | ☐ |
| Sometimes | ☐ |
| Rarely | ☐ |
| Never | ☐ |

Q22 If you did use alternative medicine, did you consult your pharmacist before using these medicines for your back pain? (Mark one only)

- | | |
|-----------|--------------------------|
| Always | ☐ |
| Sometimes | ☐ |
| Rarely | ☐ |
| Never | ☐ |

Q23 If you did use alternative medicine, did you consult your physiotherapist before using these medicines for your back pain? (Mark one only)

- | | |
|-----------|--------------------------|
| Always | ☐ |
| Sometimes | ☐ |
| Rarely | ☐ |
| Never | ☐ |

Q24 If you did use alternative medicine, did you inform your doctor after using these medicines for back pain? (Mark one only)

- | | |
|-----------|--------------------------|
| Always | ☐ |
| Sometimes | ☐ |
| Rarely | ☐ |
| Never | ☐ |

Q25 If you did use alternative medicine, did you inform your pharmacist after using these medicines for back pain? (Mark one only)

- | | |
|-----------|--------------------------|
| Always | ☐ |
| Sometimes | ☐ |
| Rarely | ☐ |
| Never | ☐ |

Q26 If you did use physiotherapy, did you consult your doctor before using physiotherapy for your back pain? (Mark one only)

- | | |
|-------------|--------------------------|
| Always | ☐ |
| Sometimes | ☐ |
| Rarely | ☐ |
| Never | ☐ |
| Did not use | ☐ |

Q27 If you did use physiotherapy, did you receive a referral from a doctor before using it for your back pain? (Mark one only)

- | | |
|-------------|--------------------------|
| Always | ☐ |
| Sometimes | ☐ |
| Rarely | ☐ |
| Never | ☐ |
| Did not use | ☐ |

Q28 Which of the following information sources have been influential in your decision to use physiotherapy for your back pain? (Mark one on each line)

	No influence at all	Of little influence	Moderately influential	Influential	Very influential
a Family or relatives	☒	☒	☒	☒	☒
b Partner	☒	☒	☒	☒	☒
c Friends or colleagues	☒	☒	☒	☒	☒
d Internet	☒	☒	☒	☒	☒
e Book or magazine	☒	☒	☒	☒	☒
f Mass media (eg newspaper, TV, radio)	☒	☒	☒	☒	☒
g Doctor	☒	☒	☒	☒	☒
h Pharmacist	☒	☒	☒	☒	☒
i Allied health worker (eg nurse)	☒	☒	☒	☒	☒
j Alternative health practitioner	☒	☒	☒	☒	☒

If you DID NOT USE alternative medicine for your back pain, please go to Question 35

Q29 If you did use alternative medicine and consulted a GP, did you feel able to talk to your GP about your alternative medicine practitioner use? (Mark one only)

Always	☒
Sometimes	☒
Rarely	☒
Never	☒
Did not consult a GP	☒

Q30 If you did use alternative medicine and consulted a GP, did you feel able to talk to your alternative medicine practitioner about your GP consultation(s)? (Mark one only)

Always	☒
Sometimes	☒
Rarely	☒
Never	☒
Did not consult a GP	☒

Q31 If you did use alternative medicine and physiotherapy, did you feel able to talk to your physiotherapist about your alternative medicine practitioner use? (Mark one only)

Always	☒
Sometimes	☒
Rarely	☒
Never	☒
Did not use physiotherapy	☒

Q32 If you used more than one alternative medicine practitioner, did you feel able to talk to your alternative medicine practitioner(s) about your other alternative medicine practitioner use? (Mark one only)

Always	☒
Sometimes	☒
Rarely	☒
Never	☒
Did not use more than one alternative medicine practitioner	☒

Q33 If you self-prescribed alternative medicine and consulted a GP, did you feel able to talk to your GP about your self-prescribed alternative medicine use? (Mark one only)

- | | |
|------------------------|-------------------------------------|
| Always | ☒ |
| Sometimes | ☒ |
| Rarely | ☒ |
| Never | ☒ |
| Did not self-prescribe | ☒ |
| Did not consult a GP | ☒ |

Q34 If you self-prescribed alternative medicine and used alternative medicine practitioner(s), did you feel able to talk to your alternative medicine practitioner(s) about your self-prescribed alternative medicine use? (Mark one only)

- | | |
|------------------------|-------------------------------------|
| Always | ☒ |
| Sometimes | ☒ |
| Rarely | ☒ |
| Never | ☒ |
| Did not self-prescribe | ☒ |

Q35 Do you agree with the following statements? (Mark one on each line)

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
a Alternative medicine is more natural than conventional medicine	☒	☒	☒	☒	☒
b Alternative medicine is effective in the treatment of back pain	☒	☒	☒	☒	☒
c Alternative medicine has fewer side effects than conventional medicine	☒	☒	☒	☒	☒
d Alternative medicine is a better approach to pain management than conventional medicine	☒	☒	☒	☒	☒
e Alternative medicine promotes a holistic approach to health	☒	☒	☒	☒	☒
f Alternative medicine gives me more control over my health / body	☒	☒	☒	☒	☒
g Alternative medicine practitioners spend a longer time with me in consultations when compared with my doctor	☒	☒	☒	☒	☒
h Alternative practitioners provide more support to me than my doctor does	☒	☒	☒	☒	☒
i I find it easier to talk to an alternative health practitioner than to a doctor	☒	☒	☒	☒	☒
j I have a more equal relationship with alternative health practitioners than with doctors	☒	☒	☒	☒	☒
k I have difficulties accessing conventional medicine for the treatment of my back pain	☒	☒	☒	☒	☒
l Knowledge about evidence of alternative medicine is important to me as a patient	☒	☒	☒	☒	☒
m Doctors should be able to advise their patients about commonly used alternative medicines for back pain	☒	☒	☒	☒	☒
n Clinical evidence is important in my choice of alternative medicine	☒	☒	☒	☒	☒
o My personal experience of the effectiveness of alternative medicine is more important than clinical evidence	☒	☒	☒	☒	☒
p Alternative medicine needs to be tested for safety / side effects	☒	☒	☒	☒	☒

Q36 Thinking about the care you have received for back pain, 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 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 Length of wait to get a GP appointment	☒	☒	☒	☒	☒	☒
j Quality of care provided by your GP	☒	☒	☒	☒	☒	☒
k Amount of time for a GP consultation	☒	☒	☒	☒	☒	☒
l Amount of information sharing by GP	☒	☒	☒	☒	☒	☒
m The outcomes of your medical care (how much you are helped by your GP)	☒	☒	☒	☒	☒	☒
n The personal manner (courtesy, respect, sensitivity, friendliness) of your GP	☒	☒	☒	☒	☒	☒
o The technical skills (thoroughness, carefulness, competence) of your GP	☒	☒	☒	☒	☒	☒
p Availability of alternative health practitioners in your community	☒	☒	☒	☒	☒	☒
q Ease of seeing the alternative health practitioner of your choice	☒	☒	☒	☒	☒	☒
r Access to information about alternative medicine	☒	☒	☒	☒	☒	☒
s Access to physiotherapists if you need them	☒	☒	☒	☒	☒	☒
t Length of wait to get a physiotherapy appointment	☒	☒	☒	☒	☒	☒
u Quality of care provided by your physiotherapist	☒	☒	☒	☒	☒	☒
v Access to pain medications if you need them	☒	☒	☒	☒	☒	☒
w Access to a female physiotherapist	☒	☒	☒	☒	☒	☒

Q37 How beneficial did you find the following practitioners or practices for your back pain?
(Mark one on each line)

	No benefit at all	Of little benefit	Moderately beneficial	Beneficial	Very beneficial	Did not consult
a GP	☒	☒	☒	☒	☒	☒
b Specialist	☒	☒	☒	☒	☒	☒
c Chiropractor	☒	☒	☒	☒	☒	☒
d Acupuncturist	☒	☒	☒	☒	☒	☒
e Herbalist / Naturopath	☒	☒	☒	☒	☒	☒
f Physiotherapist	☒	☒	☒	☒	☒	☒
g Massage Therapist	☒	☒	☒	☒	☒	☒
h Osteopath	☒	☒	☒	☒	☒	☒
i Self-prescribed alternative medicine	☒	☒	☒	☒	☒	☒

Q38 If you have private health insurance, does your policy give you a rebate for any of the following? (Mark one on each line)

	Yes	No	Don't know
a GP	☒	☒	☒
b Specialist	☒	☒	☒
c Chiropractor	☒	☒	☒
d Acupuncturist	☒	☒	☒
e Herbalist / Naturopath	☒	☒	☒
f Physiotherapist	☒	☒	☒
g Massage Therapist	☒	☒	☒
h Osteopath	☒	☒	☒
i Self-prescribed alternative medicine	☒	☒	☒
j Do not have private health insurance	☒	☒	☒

Q39 During your last period of back pain, did you seek help for any of the following symptoms or conditions relating to back pain? (Mark all that apply, indicating who you sought help from where applicable)

	GP or Specialist	Chiropractor	Acupuncturist	Herbalist / Naturopath	Physiotherapist	Massage Therapist	Osteopath	Did not seek help
a Headaches / Migraines	☒	☒	☒	☒	☒	☒	☒	☒
b Nausea	☒	☒	☒	☒	☒	☒	☒	☒
c Back pain	☒	☒	☒	☒	☒	☒	☒	☒
d Neck pain	☒	☒	☒	☒	☒	☒	☒	☒
e Leg pain / sciatica	☒	☒	☒	☒	☒	☒	☒	☒
f Arm pain	☒	☒	☒	☒	☒	☒	☒	☒
g Pins and needles / numbness	☒	☒	☒	☒	☒	☒	☒	☒
h Stiffness	☒	☒	☒	☒	☒	☒	☒	☒
i Fatigue	☒	☒	☒	☒	☒	☒	☒	☒
j Weakness	☒	☒	☒	☒	☒	☒	☒	☒
k Depression	☒	☒	☒	☒	☒	☒	☒	☒
l Sleeping problems	☒	☒	☒	☒	☒	☒	☒	☒
m Instability	☒	☒	☒	☒	☒	☒	☒	☒
n Muscle spasm	☒	☒	☒	☒	☒	☒	☒	☒
o Anxiety / tension	☒	☒	☒	☒	☒	☒	☒	☒

The next three questions ask only about now – how your health is now and about how your health limits certain activities now.

Q40 In general, would you say your health is: (*Mark one only*)

Excellent	☒
Very good	☒
Good	☒
Fair	☒
Poor	☒

Q41 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 now as one year ago	☒
Somewhat worse now than one year ago	☒
Much worse now than one year ago	☒

Q42 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 <u>Vigorous</u> activities, such as running, lifting heavy objects, participating in strenuous sports	☒	☒	☒
b <u>Moderate</u> activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf	☒	☒	☒
c Lifting or carrying groceries	☒	☒	☒
d Climbing <u>several</u> flights of stairs	☒	☒	☒
e Climbing <u>one</u> flight of stairs	☒	☒	☒
f Bending, kneeling or stooping	☒	☒	☒
g Walking <u>more than one</u> kilometre	☒	☒	☒
h Walking <u>half</u> a kilometre	☒	☒	☒
i Walking 100 metres	☒	☒	☒
j Bathing or dressing yourself	☒	☒	☒

Q43 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 (eg it took extra effort)	☒	☒

Q44 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	☒	☒

Q45 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 ☐

Q46 How much bodily pain have you had during the past 4 weeks? *(Mark one only)*

No bodily pain ☐
 Very mild ☐
 Mild ☐
 Moderate ☐
 Severe ☐
 Very severe ☐

Q47 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 ☐

Q48 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?	☐	☐	☐	☐	☐	☐

Q49 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 ☐

Q50 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	☐	☐	☐	☐	☐

(Please mark one box)

- ☒ No I would prefer not to participate in a stage 2 interview

If you have anything else about your use of alternative medicine, allied health, or general practitioners for back pain that 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.

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

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

We will detach the consent form and store it in a separate locked room.



CONSENT FORM

Project: Use of Alternative Medicine, Allied Health, and General Practitioners for Back Pain Care Among Women of the 1946 – 1951 Cohort

Researchers: Associate Professor Alex Broom, Professor Jon Adams,
Associate Professor David Sibbritt, Professor Kathryn Refshauge and Dr Emma Kirby

I agree to participate in the survey, “Use of Alternative Medicine, Allied Health, and General Practitioners for Back Pain Care Among Women of the 1946-1951 Cohort”.

I understand that this research is part of the Women’s Health Australia project, and I have read and understood the Information for Participants statement that was sent to me. By completing this form:

- I understand that completing this survey is voluntary. If I do not complete this survey, I understand that this will not affect my continuing participation in the Women’s Health Australia project.
- I understand that my personal information will remain confidential to the researchers.
- I agree that information gathered from the project may be published, provided that I will not be identified.
- I understand this project is part of Women’s Health Australia and that my responses may be linked to information I have already provided to Women’s Health Australia.

NAME:

SIGNATURE:

DATE: / /

What is your date of birth? (Please write date in boxes)

D	D	/	M	M	/	Y	Y	Y	Y
---	---	---	---	---	---	---	---	---	---

Help us keep in touch!

Please provide a best contact number in case we want to talk to you about the survey:

It would also be helpful if we could have contact details of a relative or friend (once that relative or friend has agreed that you may provide these details) who would be able to help us find you should we lose contact.

NAME:

ADDRESS:

POST CODE:

PHONE (HOME): ()

RELATIONSHIP TO YOU:



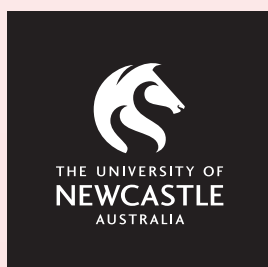


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*Australian Longitudinal Study
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UTS HREC Letter of Noting

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Fri 08/08/2014 11:04

Inbox

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Dear Applicant,

The Faculty has considered your Nil/Negligible Risk Declaration Form for your project titled, "Use of Complementary and Alternative Medicine for back pain by women across Australia", 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 2014000346.

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.

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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,

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Chairperson

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Review Article

An integrative review of complementary and alternative medicine use for back pain: a focus on prevalence, reasons for use, influential factors, self-perceived effectiveness, and communication

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Abstract

BACKGROUND CONTEXT: Back pain is the most prevalent of musculoskeletal conditions, and back pain sufferers have been identified as high users of complementary and alternative medicine (CAM). Despite lacking evidence, CAM treatments (eg, acupuncture, chiropractic, and massage) and CAM products (eg, vitamins, supplements, and aromatherapy oils) for back pain care have become widely available internationally, and CAM use by back pain sufferers has become a significant health service issue. However, to date, there has been no integrative review on CAM use for back pain.

PURPOSE: This study aims to conduct an integrative review on CAM use for back pain focusing on prevalence of use, commonly used CAM, characteristics of users, factors influencing decision making, self-perceived effectiveness, and communication with health-care providers.

STUDY DESIGN/SETTING: The study is based on an integrative literature review.

METHODS: A comprehensive search of international literature from 2000 to 2014 in MEDLINE, CINAHL, AMED, DARE, EMBASE, Excerpta Medica, psycINFO, and SCOPUS databases was conducted. The search was limited to peer-reviewed articles published in English language and reporting empirical research findings on CAM use for back pain.

RESULTS: The review reveals a considerable variation in prevalences of CAM use for back pain internationally. Acupuncture, chiropractic, osteopathy, and massage therapy are the commonly used CAM treatments besides a range of self-prescribed CAM, and back pain sufferers use CAM alongside conventional medical treatments. Female gender, chronicity of back pain, and previous exposure to CAM are key predictors of CAM use for back pain as highlighted from the reviewed literature. Family, friends, and recommendation by doctors appear to influence decision making on CAM use for back pain. The review reveals that users of CAM for back pain tend to report CAM as beneficial, but there is little knowledge on communication between CAM users with back pain and health-care providers about such use. Existing literature is largely based on the research investigating CAM use for back pain among a range of other health conditions. Further rigorous research is needed to investigate the use of a wider range of CAM treatments, particularly self-prescribed CAM for back pain.

FDA device/drug status: Not applicable.

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DP110104636 funded the overall research project on Australian women's use of complementary and alternative medicine for back pain. However, the current literature review did not receive any separate funding outside of the overall study).

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CONCLUSIONS: The review findings provide insights for health-care providers and policy makers on the range of CAM treatments used by back pain sufferers. Conventional medical and CAM practitioners should be aware of back pain sufferers' decision making regarding a range of CAM treatments and be prepared to communicate with patients on safe and effective CAM treatments for back pain. © 2015 Elsevier Inc. All rights reserved.

Keywords: Complementary and alternative medicine; Back pain; Review; Self-prescribed CAM; Prevalence; Perceived effectiveness; Communication

Introduction

Complementary and alternative medicine (CAM) refers to a broad range of healing modalities external to the biomedical models of health care with an array of nonprescription products and health-care services not linked to the medical profession or the medical curriculum [1–3]. Despite lacking evidence base, CAM has become widely available internationally and has become popular in recent years in Australia and United States among many other countries [4,5]. Complementary and alternative medicine and its use have become the topic of significant international public health investigation [6,7], and the use of CAM in the treatment of chronic health conditions such as “back pain” [8] has become a significant health service issue.

Back pain is the most prevalent of musculoskeletal conditions and is the second most common complaint in general practice [9–13] with a lifetime prevalence of up to 75% affecting a large proportion of the adult population [14–17]. Back pain poses major constraints on individuals, health systems, and social care systems across developed countries [18–23]. Nonsteroidal anti-inflammatory drugs, although effective for symptomatic pain relief in back pain, have shown more adverse effects than paracetamol during long-term use [8]. As unresolved back pain results in reduced physical function and psychological distress [24], back pain sufferers tend to explore a wide range of treatments, including CAM [13,25–33]. Although evidence for CAM treatments in back pain is inconclusive [34–41], a wide range of CAM treatments are available in the market place consisting of practitioner-based CAM treatments (eg, acupuncture, chiropractic, and massage) and self-prescribed CAM for back pain (eg, vitamins, supplements, and aromatherapy oils) [13,26–30,42–47].

Although the treatment for back pain is known to be a continuing challenge and that back pain sufferers are likely to explore multiple treatments, to date, there has been no integrative review on prevalence of CAM use, characteristics of CAM users, CAM users' decision making, self-perceived effectiveness of CAM in back pain, and users' communication about CAM use with health-care providers. In response, this article provides the first synopsis and evaluation of CAM use for back pain by reviewing research findings from the recent international empirical literature. This article aims to identify relevant studies that investigate

the use of CAM for back pain, analyze the quality of these studies, report key findings from these studies employing a theme-based analysis, and highlight gaps in the current literature and make recommendations for future research on this important health service issue.

Methods

Search design

The MEDLINE, CINAHL, AMED (Allied and Complementary Medicine database), DARE, EMBASE, Excerpta Medica, psycINFO, and SCOPUS databases were searched for articles published from 2000 to 2014 using the following keywords and phrases: “back pain” OR “low back ache” AND “complementary medicine” OR “complementary therapies” OR “alternative medicine” OR “alternative therapies” OR “manipulative therapies” OR CAM OR chiropract* OR massage OR osteopath* OR yoga OR naturopath* OR herbal* OR aromatherapy OR “Chinese medicine” OR homeopathy OR acupuncture OR prayer OR supplement* OR meditation. The CINAHL, MEDLINE, and DARE are the most popular databases for health scholarship, whereas the AMED database provides an important resource focused specifically on allied health and CAM scholarship.

The search results were imported into EndNote X6 (Thomson Reuters, New York, NY, USA), a bibliographic management system software program. All duplicate items were removed, and the remaining articles were screened and assessed by titles and abstracts. Articles included in the review were required to be peer-reviewed, research-based articles reporting new empirical findings with a focus on CAM use among people with back pain or CAM use among a broader population (where CAM use for back pain is clearly identifiable). Individual case reports and CAM clinical trials on back pain were excluded from the review. In those circumstances where an abstract provided insufficient detail with which to assess the manuscript, the full article was retrieved and examined to make a final decision regarding inclusion or exclusion status.

To ensure all relevant literature on CAM use for back pain were identified, the authors also conducted hand searches in relevant peer-reviewed journals such as *Spine*, *Clinical Rheumatology* and *Complementary Therapies in Medicine*.

Relevant works were also searched in Google Scholar and by examining bibliographies of already identified publications as another means of ensuring the rigor of the search.

Search outcomes

The initial search identified 611 articles. Of these, a total of 30 articles met the strict selection criteria and were included in the review. The [Figure](#) reports the steps of literature search, and [Table 1](#) provides general information on each article included in this review.

Quality appraisal

To appraise the quality of the studies selected for review, the authors used a quality scoring system ([Table 2](#)) previously used for assessing prevalence studies on neck pain [\[70\]](#), CAM use among cancer patients [\[71\]](#), and CAM use among headache and migraine patients [\[72\]](#). The use of this analytical tool allowed for systematic evaluation and comparison of the identified studies. Two authors assigned scores to the studies separately; the results were then compared and differences resolved by discussion. The quality scores of each study are reported in [Table 3](#).

Results

A total of 30 manuscripts met the review inclusion criteria and reported a wide variety of information on CAM use for back pain ([Tables 1 and 5](#)). In line with the quality appraisal scoring system, studies included in this review were divided into two types: large sample size ($n > 500$) and small sample size ($n < 500$). Large sample-sized studies ranged from 517 to 31,044 participants (mean: 2,696; median: 1,950), and the small sample-sized studies ranged from 92 to 249 participants (mean: 175; median: 194). Only four

studies had small sample sizes and were conducted in clinical settings [\[60,61,66,67\]](#). Of the large sample-sized studies, 8 were conducted in clinical settings [\[30,43,62–65,68,69\]](#) and the remaining 18 were population-based studies [\[26,29,42,44,45,47–59\]](#).

A significant number of studies ($n = 11$) considered for this review were from North America followed by studies from Europe ($n = 9$), Australia ($n = 7$), Western Asia ($n = 2$), and Southeast Asia ($n = 1$). The majority of large sample-sized population studies were from North America ($n = 8$) and Australia ($n = 7$), and Australia had the largest number of large-sized population studies specific to back pain ($n = 6$). Of these Australian back pain-focused studies, five articles reported analyses from a National Longitudinal Study on Women's Health [\[26,47,50,58,59\]](#). The analysis of the articles has been grouped into five themes, and [Table 5](#) provides an overview of the important findings.

Prevalence of CAM use

The prevalence rates of overall CAM use for back pain reported in the articles drawing on large sample sizes ranged from 6% to 76.4% (mean: 34.2%; median: 29%) [\[26,42,44,47,49–52,58,59\]](#). Among these, five studies drawing on nationally representative samples focused on consultations with one or more CAM practitioner types for back pain reporting prevalences ranging from 37% to 76.4% (mean: 55.2%; median 53.6%) [\[26,47,50,51,58\]](#). One Australian study examining women with back pain reported the prevalence of self-prescribed CAM use as 75.2% [\[59\]](#). Two other studies from the United States reported findings from research on nationally representative samples and reported on general CAM use for back pain (employing a broad definition of CAM housing both practitioner and self-prescribed CAM use). The prevalence rates of CAM use for back pain in these two studies were 6% and 13.3% [\[42,52\]](#). Three studies using nationally representative samples reported exclusive CAM use (use of CAM alone for back pain by participants who did not seek conventional medical care) as ranging from 1.7% to 20.5% (mean: 8%; median: 2%) [\[42,47,50\]](#). Among the other studies with large (but not nationally representative) samples, the prevalence rates of use of CAM for back pain ranged from 11.4% to 69% (mean: 29.4%; median: 28%) [\[30,43–45,49,62,68\]](#). Although some other studies with large samples reported on the prevalence of CAM use, they either combined back and neck pain together as a single questionnaire item or considered back pain within the broad category of musculoskeletal pain and as such did not allow extraction of prevalence rates specifically for back pain [\[48,54,55,57,65\]](#). Of the four studies drawing on small samples, three studies identified prevalence rates of CAM use for back pain within a range of 5.6% to 62.7% (mean: 38.3%; median: 46.6%) [\[60,61,66\]](#). One of the small sample-sized studies, while investigating the use of CAM for chronic pain, reported the prevalence of back pain in the

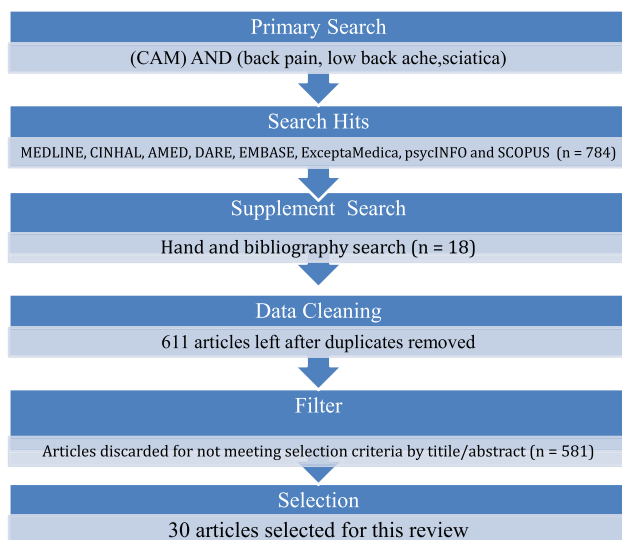


Figure. Flowchart of literature search steps.

Table 1
Research-based studies on CAM use for back pain, 2000 to 2014

Study (year)/country	Research focus	CAM modality	Design, sample size (n), and study setting
Xue et al. (2008) [29]/Australia	User profile, reasons for use, decision making, and self-perceived effectiveness	Acupuncture, chiropractic, and osteopathy	Cross-sectional (n=1,067), population
Cote et al. (2001) [48]/Canada	User profile and reasons for CAM use	Chiropractic and massage therapy	Cross-sectional (n=1,131), population
Ong et al. (2004) [45]/UK	Prevalence, profile, and reasons for CAM use	Chiropractic and osteopathy	Cross-sectional (n=8,889), population
Wade et al. (2008) [42]/USA	Prevalence, profile, reasons, and decision making on CAM use	Acupuncture, chiropractic, homeopathy, massage, medicinal herbs, prayer, tai chi, vitamins/nutritional supplements, and yoga/meditation	Cross-sectional (n=808), population
Broom et al. (2012) [47]/Australia	Prevalence, profile, and reasons for CAM use	Acupuncture, aromatherapy oils, Chinese medicine, chiropractic, herbal medicines, massage therapy, meditation/yoga, naturopath/herbalist, osteopathy, and vitamins/minerals	Cross-sectional (n=9,820), population
Ong et al. (2002) [49]/UK	Prevalence, profile, and reasons for CAM use	Acupuncture, herbal medicine, homeopathy, osteopathy/chiropractic, and spiritual healing	Cross-sectional (n=8,889), population
Shmueli et al. (2011) [44]/Israel	Prevalence, profile, reasons for CAM use, decision making, and effectiveness	Acupuncture, biofeedback, chiropractic, homeopathy, naturopathy, and reflexology	Cross-sectional (n=2,505), population
Broom et al. (2012) [50]/Australia	Prevalence and reasons for CAM use	Acupuncture, chiropractor, massage therapy, naturopath/herbalist, and osteopath	Cross-sectional (n=10,492), population
Millar (2001) [51]/Canada	Prevalence, profile, reasons for use, and decision making on CAM use	Acupuncture, chiropractic, homeopathy, massage therapy, and naturopathy	Longitudinal (n=22,568), population
Kanodia et al. (2010) [52]/USA	Prevalence, profile, reasons for use, communication, and effectiveness	Acupuncture, chiropractic, herbal medicines, massage, qi gong, relaxation techniques, tai chi, and yoga	Cross-sectional (n= 31,044), population
Saper et al. (2004) [53]/USA	Profile, reasons for use, and self-perceived effectiveness	Yoga	Cross-sectional (n=2,055), population
Sibbritt et al. (2011) [54]/Australia	Profile and reasons for use	Meditation and yoga	Longitudinal (n=19,209), population
McCaffrey et al. (2004) [55]/USA	Profile, reasons for use, and self-perceived effectiveness	Prayer	Cross-sectional (n= 2,055), population
McGrady et al. (2008) [56]/USA	Profile and reasons for use	Acupuncture	Cross-sectional (n=7,371), population
Wolsko et al. (2003) [57]/USA	Self-perceived effectiveness	Chiropractic, massage, and relaxation therapy	Cross-sectional (n=2,055), population
Murthy et al. (2013) [58]/Australia	Prevalence, profile, and reasons for CAM use	Acupuncture, chiropractic, massage therapist, meditation/yoga practitioner, naturopath/herbalist, and osteopath	Cross-sectional (n=1,310), population
Murthy et al. (2014) [59]/Australia	Prevalence, profile, and reasons for CAM use	Aromatherapy oils, herbal medicines, meditation/yoga, supplements, and vitamins/minerals	Cross-sectional (n=1,310), population
Kirby et al. (2013) [26]/Australia	Prevalence, profile, reasons for use, decision making, and communication	Acupuncturist, chiropractor, herbalist/naturopath, massage therapist, and osteopath	Cross-sectional (n=1,310), population
Sherman et al. (2004) [60]/USA	Prevalence, profile, reasons for use, decision making, and effectiveness	Chiropractic, massage, meditation, and tai chi	Cross-sectional (n=249), clinical
Chenot et al. (2007) [30]/Germany	Prevalence, profile, reasons for use, decision making, and communication	Acupuncture, cupping, homeopathy, local heat, massage, naturopathy, osteopathy, and spinal manipulation	Longitudinal (n=1,342), clinical
Gau et al. (2011) [61]/Germany	Prevalence, profile, reasons for use, decision making, and communication	Acupuncture, massage therapy, and thermotherapy	Cross-sectional (n=432), clinical

(Continued)

Table 1
(Continued)

Study (year)/country	Research focus	CAM modality	Design, sample size (n), and study setting
Chenot et al. (2006) [62]/Germany	Prevalence, reasons for use, effectiveness, and communication	Acupuncture and massage	Longitudinal (n=1,218), clinical
Hartvigsen et al. (2002) [63]/Denmark	Reasons for use and decision making	Chiropractic	Cross-sectional (n=1,897), clinical
Ailliet et al. (2010) [64]/Belgium	Profile, reasons for use, decision making, and self-perceived effectiveness	Chiropractic	Cross-sectional (n=517), clinical
Fleming et al. (2007) [43]/Germany	Prevalence, profile, reasons for use, and self-perceived effectiveness	Acupressure, acupuncture, chiropractic, craniosacral therapy, herbs/supplements, massage, meditation, prolotherapy, and yoga	Cross-sectional (n=908), clinical
Palinkas et al. (2000) [65]/USA	Profile, reasons for use, decision making, and self-perceived effectiveness	Acupuncture, chiropractic, herbal medicines, homeopathy, massage, meditation, naturopathy, and supplements	Cross-sectional (n=542), clinical
Peleg et al. (2011) [66]/Israel	Prevalence, profile, reasons for use, and self-perceived effectiveness	Acupuncture, chiropractic, herbal medicine, homeopathy, massage therapy, naturopathy, reflexology, and shiatsu	Cross-sectional (n=163), clinical
Ho et al. (2009) [67]/Singapore	Profile and reasons for use	Massage therapy, spiritual healing, and vitamins/supplements	Cross-sectional (n=92), clinical
Coulter et al. (2002) [68]/USA	Prevalence, profile, reasons for use, and self-perceived effectiveness	Chiropractic	Cross-sectional (n=1,275), clinical
Gkolfinopoulos et al. (2003) [69]/UK	Profile	Chiropractic	Cross-sectional (n=1,000), clinical

CAM, Complementary and Alternative Medicine.

sample but did not specify the prevalence rate of CAM use specifically for back pain [67].

Commonly used CAM

In this review, more than half of the articles reported were on the use of specific CAM modalities for back pain (see Table 4). Among a range of CAM modalities, acupuncture, chiropractic, osteopathy, and massage therapy were commonly used for back pain. The use of acupuncture for back pain was reported in a number of articles included in the review (in the range of 6%–60.2%, mean: 27.4%; median: 13.3%) [29,30,47,50,56,58,60–62]. The use of acupuncture for back pain showed wide variation between population-based studies (ranging from 6% to 60.2%, mean: 22.4%; median: 13.3%) [29,47,50,56,58] and studies conducted within clinical settings (ranging from 11% to 59%, mean: 33.6%; median: 32.2%) [30,60–62].

Seven population studies drawing on large samples reported prevalence of chiropractic use for back pain from 16.1% to 74% (mean: 39.3%; median: 33%) [29,47,48,50,52,57,58], and four studies in clinical settings reported prevalence of chiropractic use ranging from 16.3% to 45% (mean: 36%; median: 41.5%) [60,63,64,68]. The prevalence of osteopathic treatment for back pain ranged from 4.1% to 48.4% (mean: 17.3%; median: 8.4%) as reported by four population studies drawing on fieldwork

with large samples [29,47,50,58]. A German study in a clinical setting reported 5.6% of a sample of 177 back pain patients using osteopathy [61].

Studies with large samples identified massage therapy consultation rates for back pain between 7% and 41.4% (mean: 25.9%; median: 26.5%) [30,47,48,50,52,57,58]. Apart from one German study [30] of patients consulting general practitioners, all other six studies with large samples were population studies. Meanwhile, within two small sample-sized studies reporting massage therapist consultations for back pain, one from the United States reported a prevalence rate of 24% and another from Germany reported a prevalence rate of 62.7% [60,61].

CAM user profiles

Among the manuscripts included in the review, 21 articles [26,29,30,42–45,47–49,51–56,58,59,64,65,68] reported research from large samples and 4 articles [60,61,66,67] reporting on research with small samples provided data on socioeconomic status of CAM users. Of the 27 articles outlining the age of CAM users, 24 articles [26,29,30,42–45,48–56,58,59,62–65,68,69] reported on large samples and 3 articles [60,61,66] reported on small samples (under 500). Only 12 articles reported on the ethnicity of CAM users for back pain [29,42–45,52,53,56,62,65–67], and of these, 2 articles outlined empirical findings from studies with small samples [66,67].

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

Dimensions of quality assessment	Points awarded*
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 past 12 months)	1
Reporting of participants' characteristics	
E. Back pain specific	1
F. Age	1
G. Ethnicity	1
H. Indicator of socioeconomic status (eg, income and 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

CAM, Complementary and Alternative Medicine.

Note: Adopted from Fejer et al. [70], Bishop et al. [71], and Adams et al. [72].

* Maximum score: 11 points.

Although several studies report general CAM use, population-based studies analyzing sociodemographic characteristics of CAM use for back pain were sparse with only three studies [47,58,59] from Australia and a national survey from the United States examining this topic [52]. The Australian studies noted high use of CAM for back pain among mid- to old-aged women as revealed via longitudinal analyses of a cohort of women aged 53 to 61 years (in 2004) and the same cohort of women when aged 56 to 61 years (in 2007) [47]. As these studies did not consider other age groups and were restricted to a female-only focus, they have obvious limits with regard to understanding the sociodemographic characteristics of CAM users for back pain across total populations. A further substudy also from the Australian Longitudinal Study on Women's Health focusing on CAM use for back pain conducted in 2011 using a nationally representative sample of women aged 60 to 65 years revealed no association between income, educational level, marital status or urban/rural residence, and the women's consultation with CAM practitioners or self-prescribed CAM usage for back pain [58,59]. An US national health survey of the adult population found that CAM use for back pain was associated with young age, non-Hispanic, females, and those who had at least completed high school education [52].

A number of articles included in this review reported sociodemographic characteristics of users of specific CAM modalities for back pain. A Canadian population-based study examining health-care utilization by neck or low back pain sufferers found that, in contrast with the association between exclusive conventional medical care use by neck or low back pain sufferers and lower educational levels and lower income, exclusive chiropractic use was associated with higher educational levels and higher income

[48]. Although in this study the analyses conducted included low back pain or neck pain (potentially posing a limitation to its interpretation on chiropractic use for back pain), it was reported in the article that no appreciable differences between the two categories of low back pain and neck pain in terms of their study participants' care seeking behavior existed [48]. This same study also found that chiropractic consultations for neck/low back pain were higher among males and those residing in rural areas compared with those who consulted a conventional medical practitioner for their neck/low back pain [48]. An UK population survey of osteopathic and chiropractic use for back pain reported higher prevalence for these modalities among 34- to 49-year olds than other age groups, higher prevalence of use by women than men, and higher prevalence of use by nonmanual workers than manual workers [45]. A German study on determinants of acupuncture use for low back pain found that acupuncture treatment for back pain was associated with female gender, older age, and being retired [62] but did not show any association with education, income, or marital status for receiving acupuncture among low back pain patients [62]. An US study examining the use of acupuncture, chiropractic, massage, meditation, and tai chi did not find any consistent association with sociodemographic characteristics for the choice of CAM treatments for back pain [60]. Predictors for sociodemographic characteristics of CAM use for back pain are varied among studies within and across different countries. The variation of definition regarding age groups, educational levels, and income categories across the different studies, therefore, restricts the comparisons between sociodemographics of CAM use for back pain. However, despite these challenges, the literature does appear to show that female gender is an important predictor of CAM use for back pain.

Beyond studies from the United States, data on ethnicity of CAM users for back pain appear severely limited with most non-US studies only reporting on "country of birth" rather than the participants' ethnic origins and several other studies providing no data on patient ethnicity. Two US studies [52,60] investigating the use of CAM for back pain reported higher use of CAM among people of white race. Four studies [43,56,66,67] conducted in United States, Israel, and Singapore, which included use of CAM for back pain as one of the survey items among other health conditions, reported high use of CAM among white participants. Some studies in the United States investigating CAM use in general, which also noted high use of CAM for back pain, reported use of CAM more prevalent among people of white race [42,53,65]. Despite lack of exhaustive data on ethnicity of CAM users for back pain, literature seems to note greater use of CAM for back pain among white populations.

Reasons for CAM use and influential factors

The most common reasons for CAM use for back pain from large sample-sized population studies were

Table 3

Quality score of studies on CAM use for back pain

Study (year)	Dimensions of quality assessment			Total score
	Methodology	Reporting of participants' characteristics	Reporting of CAM use	
Xue et al. (2008) [29]	3 (A, B, D)	3 (F, G, H)	2 (I, K)	8
Cote et al. (2001) [48]	3 (A, B, D)	3 (E, F, H)	2 (I, K)	8
Chenot et al. (2007) [30]	3 (B, C, D)	3 (E, F, H)	2 (I, K)	8
Ong et al. (2004) [45]	4 (A, B, C, D)	3 (E, F, H)	3 (I, J, K)	10
Sherman et al. (2004) [60]	0	4 (E, F, G, H)	2 (I, K)	6
Broom et al. (2012) [47]	4 (A, B, C, D)	1 (E)	3 (I, J, K)	8
Gaul et al. (2011) [61]	2 (C, D)	2 (F, H)	3 (I, J, K)	7
Chenot et al. (2006) [62]	3 (B, C, D)	3 (E, F, G)	2 (I, J)	8
Wade et al. (2008) [42]	3 (A, B, D)	3 (F, G, H)	2 (I, K)	8
Ong et al. (2002) [49]	3 (A, B, D)	2 (F, H)	3 (I, J, K)	8
Hartvigsen et al. (2002) [63]	3 (B, C, D)	1 (F)	2 (I, K)	6
Shmueli et al. (2011) [44]	4 (A, B, C, D)	3 (F, G, H)	1 (I)	8
Ailliet et al. (2010) [64]	3 (B, C, D)	2 (F, H)	2 (I)	7
Fleming et al. (2007) [43]	3 (B, C, D)	3 (F, G, H)	3 (I, J, K)	9
Broom et al. (2012) [50]	4 (A, B, C, D)	2 (E, F)	3 (I, J, K)	9
Millar (2001) [51]	4 (A, B, C, D)	2 (F, H)	1 (I)	7
Palinkas and Kabongo (2000) [65]	4 (A, B, C, D)	3 (F, G, H)	3 (I, J, K)	10
Kanodia et al. (2010) [52]	3 (A, B, D)	4 (E, F, G, H)	2 (I, K)	9
Peleg et al. (2011) [66]	2 (C, D)	3 (F, G, H)	1 (I)	6
Ho et al. (2009) [67]	0	2 (G, H)	3 (I, J, K)	5
Saper et al. (2004) [53]	3 (A, B, D)	3 (F, G, H)	2 (I, K)	8
Sibbritt et al. (2011) [54]	3 (A, B, D)	2 (F, H)	2 (I, K)	7
McCaffrey et al. (2004) [55]	3 (A, B, D)	2 (F, H)	2 (I, K)	7
McGrady et al. (2008) [56]	3 (A, B, D)	3 (F, G, H)	2 (I, K)	8
Wolsko et al. (2003) [57]	3 (A, B, D)	1 (E)	2 (I, K)	6
Coulter et al. (2002) [68]	4 (A, B, C, D)	2 (F, H)	2 (I, K)	8
Gkolfopoulos et al. (2003) [69]	2 (B, C)	2 (E, F)	2 (I, K)	6
Murthy et al. (2013) [58]	4 (A, B, C, D)	3 (E, F, H)	2 (I, K)	9
Murthy et al. (2014) [59]	4 (A, B, C, D)	3 (E, F, H)	2 (I, K)	9
Kirby et al. (2013) [26]	4 (A, B, C, D)	3 (E, F, H)	3 (I, J, K)	10

CAM, Complementary and Alternative Medicine.

“frequent, disabling, or chronic back pain,” suggesting these factors as important predictors of CAM use for back pain [26,45,47,48,50]. Small sample-sized studies from Germany, Israel, and Singapore investigating CAM use for pain syndrome also found back pain as an important reason in patients’ decision to choose CAM [61,66,67]. An US study of patients using opioid therapy for chronic pain identified “severity of back pain” as a significant reason for CAM use [43]. Dissatisfaction with general practitioners’ (GPs) availability, length of waiting for appointments with GPs, or lack of benefit from conventional medical treatments for back pain were noted as reasons for CAM use by studies focusing specifically on CAM use by back pain sufferers [26,50,52]. In general, most back pain-specific studies using large samples did not find gender, age, or functional capacity as determinants of CAM use for back pain [30,45,48,52,62].

In two Australian studies, one investigating CAM consultations [58] and the other investigating self-prescribed CAM treatments [59] for back pain, the frequency of CAM use was greater with increased visits to GPs confirming CAM as an additional treatment option to conventional medical care. The pattern of CAM use for back pain supplementary to

conventional care was evident across back pain-specific population studies from North America, Europe, and Australia, thereby suggesting that back pain sufferers did not choose CAM instead of conventional medicine [26,45,47,48,50,52,58,59]. Two studies from Germany reported that patients were willing to receive CAM treatments if provided or recommended by a conventional medical practitioner [30,62]. In a small sample-sized US study examining back pain sufferers’ willingness to try CAM treatments, patients were willing to try CAM therapies supplementary to conventional medicine if CAM treatment was provided by a GP or if CAM treatments were subsidized [60]. Back pain sufferers’ decision making on CAM use influenced by recommendation and/or provision of CAM treatment for back pain by GPs was a finding reported by four other studies that examined CAM use for back pain among a range of other health problems [42,44,51,65]. Three studies that specifically focused on CAM use for back pain reported recommendations by family/friends/acquaintances and previous use of CAM as influencing back pain patients’ decision making on CAM use [30,60,61]. Two studies that investigated chiropractic use among large samples of patients in clinical settings reported the rates of referral by family or friends as 23% [63]

Table 4
Prevalence of CAM use for back pain in various countries, 2000 to 2014

Articles	Country	Acupuncture (%)	Chiropractic (%)	Osteopathy (%)	Massage (%)	Naturopath (%)	Homeopathy (%)	Vitamins/minerals (%)	Supplements (%)	Aromatherapy (%)	Herbal medicines (%)	Chinese medicine (%)	Yoga/meditation (%)	Relaxation (%)	Prayer (%)	Craniosacral therapy (%)	Reflexology (%)	Reiki (%)
Xue et al. (2008) [29]	Australia	20.7	65.7	48.4														
Broom et al. (2012) [47]*	Australia	12	33	8	40	14		77		25	39	7	22					
Broom et al. (2012) [50]*	Australia	6	16.1	4.1	26.5	10												
Murthy et al. (2013) [58]*,†	Australia	13.3	37.3	8.8	44.1	9.5			1.9‡		9.5§	2.8¶	9.5			1.5‡	3.0‡	3.5‡
Kirby et al. (2012) [26]*,†																		
Murthy et al. (2014) [59]	Australia							45.2	59.2	8.5	13.1		14.3					
Ailliet et al. (2008) [64]	Belgium		16.3															
Cote et al. (2001) [48]	Canada		28.8		7.0													
Hartvigsen et al. (2002) [63]	Denmark		42															
Chenot et al. (2006) [62]	Germany	59																
Chenot et al. (2007) [30]	Germany	13			31		3											
Gau et al. (2011) [61]	Germany	51.4		5.6	62.7		11.9	22.7			13.1							
Ong et al. (2004) [45]	UK			11.4														
Coulter et al. (2002) [68]	USA		41											12				
Wolsko et al. (2003) [57]	USA		20		14													
Sherman et al. (2004) [5]	USA	11	45		24								7					
Saper et al. (2004) [60]	USA												42.4					
McCaffrey et al. (2004) [55]	USA														2.69			
McGrady et al. (2008) [56]	USA	60.2																
Wade et al. (2008) [42]	USA							73.5			67.5							
Kanodia et al. (2010) [52]	USA		74		22													

CAM, Complementary and Alternative Medicine.

* Naturopaths can also be herbalists in Australia.

† The study participants in b and C are from the same sample, and c also reported self-prescribed CAM treatments for back pain.

‡ Consultation with an aromatherapist.

§ Consultation with a herbalist.

¶ Consultation with a traditional Chinese medicine practitioner.

|| Osteopaths can also be chiropractor in the UK.

Table 5
Important findings on CAM use for back pain, 2000 to 2014

Meta-theme	Theme		Important findings	Study characteristics	Key conclusions
1	Prevalence	a. Overall CAM use	6%–76.4% (mean: 34.2%, median: 29%) [26,42,44,47,49–52,58,59]	Large* population studies [26,42,44,47,49–52,58,59]	Considerable prevalence of CAM use by back pain sufferers
		b. CAM practitioner use	37%–76.4% (mean; 55.2%; median: 53.6%) [26,47,50,51,58]		Back pain sufferers tend to use CAM alongside conventional medical care
		c. Exclusive CAM use [†]	1.7%–20.5% (mean: 8%; median: 2%) [42,47,50]		Combining back pain with other painful conditions in study design limits extraction of prevalence data
		d. Self-prescribed CAM use	75.2% [59]		Broad definitions of CAM and/or diversity of CAM modalities contribute to inconclusive data on prevalence
2	CAM user profiles	a. Overall CAM use	Common among women [47,52,58,59] Higher among white ethnicity [42,52,53,56]	Large nationally representative studies [42,47,52,53,56,58,59], large population studies [45,48], and large study in a clinical setting [62]	Sparse data on sociodemographic characteristics of CAM use from population-based back pain studies
		b. Acupuncture use (Germany)	Higher among women, older age, and retired [62]		Sociodemographic characteristics of CAM use for back pain are varied among studies within and across different countries
		c. Chiropractic use (Canada)	Common among men, higher educational levels, higher income, and rural residence [48]		
		d. Osteopathic/chiropractic use (UK)	Higher among women, 34- to 49-year olds, and nonmanual workers [45]		
3	Reasons for CAM use and influential factors	a. Common reasons for CAM use	Frequent, disabling/chronic back pain [26,45,47,48,50] Dissatisfaction/waiting for appointments with GPs/lack of benefit from conventional medical treatments [26,50,52]	Large population studies [42,44,45,47,48,51], large nationally representative studies [26,50,52], large studies in clinical settings [30,62,65], and small studies* in clinical settings [60,61]	Back pain is a key determinant for CAM use Exclusive CAM use for back pain is rare, and, instead, back pain sufferers use CAM alongside conventional medical treatments
		b. Decision making on CAM use	Willingness to receive CAM treatment if recommended or provided by GPs [30,42,44,51,60,62,65] Recommendations by family/friends and previous use of CAM [30,60,61]		
4	Self-perceived effectiveness of CAM use	CAM modality	Chiropractic: 66% [52] and 61% [57] Massage: 65% [57] and 56% [52] Yoga/tai chi/qui gong: 56% [52] Acupuncture: 42% [52] Relaxation techniques: 43% [57] and 28% [52] Herbal medicines: 32% [52]	Large nationally representative studies [52,57]	Despite lack of evidence for acupuncture, chiropractic, osteopathy, and massage, these were perceived by their users as effective in the treatment of back pain

5	Communication regarding CAM use and referrals	a. Recommendation by GPs for receiving CAM b. Participants spoke to their GPs about CAM use c. Participants felt they were always able to talk to their GP about CAM practitioner use d. Participants felt they were never able to talk to their GP about CAM practitioner use	24% [52] 77.4% [61] 58.9% [26] 7.2% [26]	Large nationally representative study and [26,52] small study in a clinical setting [61]	Majority of studies did not examine communication by back pain sufferers about CAM use with GPs; therefore, it is difficult to generalize that CAM use disclosure is common
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CAM, Complementary and Alternative Medicine; GP, general practitioner.
* Large studies with sample size of n>500 and small studies with sample size n<500.
† Use of CAM alone for back pain by participants who did not seek conventional medical care.

and 65.8% [64], and a study on the use of acupuncture, chiropractic, or osteopathy among 1,067 adults in Australia also noted family/friends as the most common form of referral to these therapies [29]. Only one study reported the media as influencing CAM use (among one-third of a sample of US women) [42].

Self-perceived effectiveness of CAM use for back pain

Nearly half the reviewed articles reported on self-perceived effectiveness of CAM use and showed that back pain sufferers who use CAM perceive their CAM treatments to be beneficial. In general, users of chiropractic, acupuncture, osteopathy, naturopathy, massage, yoga, herbal medicine, and/or prayer perceived the use of these CAM as beneficial [29,43,44,53,55,62,64–66,68]. However, the majority of articles reviewed considered CAM use for various health conditions including, but extending beyond, back pain, and only five studies considered participants’ perceptions of CAM effectiveness specifically and exclusively for back pain. Of these five back pain–focused studies, two US population studies reported satisfaction with chiropractic (66% and 61%), massage (56% and 65%), and relaxation techniques (28% and 43%), respectively, for back pain [52,57], and yoga/tai chi/qui gong (56%), acupuncture (42%), and herbal medicines (32%) were also rated effective for treating back pain in one study [52]. In an US study examining the willingness of adults with back pain to try a range of CAM, massage was perceived by the participants as more helpful than other options, whereas the least beneficial treatment for back pain was perceived as being meditation among this study sample [60]. However, respondents in this study who were 65 years and older were less optimistic about the potential benefit of acupuncture and massage for treating back pain [60]. Meanwhile, an Australian study on the use of CAM for back pain among women aged between 60 and 65 years found women who consulted with an acupuncturist, herbalist, naturopath, or massage therapist rated these treatment options as more beneficial than other CAM treatments for treating their back pain [26].

Communication regarding CAM use and referrals

Three articles from those reviewed reported on referral to CAM practitioners specifically for back pain or communication about CAM use by back pain sufferers with care providers [26,52,61]. An US study identified that 24% of those who used CAM for back pain did so following a recommendation from their conventional medical practitioner [52], and an Australian survey of female back pain sufferers found that 58.9% of respondents felt they were always able to talk to their GP about CAM practitioner use, whereas 7.2% felt they were never able to talk to their GP about CAM practitioner use for back pain [26]. Meanwhile, the same Australian study also revealed that 62.5% of the women sampled always felt they could talk to their CAM

practitioner about consulting a GP for their back pain and 8.9% felt this was never possible [26]. A German study conducted at a primary health-care clinic comparing CAM use for back pain and headache reported that 77.4% of the study participants had spoken to their GPs about CAM use [61].

Discussion

This article reports the first integrative review of international literature on CAM use for back pain providing insights of benefit to conventional health and CAM practitioners in their attempts to provide coordinated back pain care. The findings published by empirical research since 2000 suggest CAM use for back pain as an important contemporary health service issue.

Although our review suggests that there is substantial evidence for CAM use in back pain across countries, the capacity of this review to compare findings from various studies and/or generalize evidence of CAM use for back pain is difficult because of the variation in research designs (eg, population based vs. clinical settings). Furthermore, as our research draws its findings from studies conducted in different countries, it is to be expected that the vast differences in legal and regulatory frameworks of CAM practices prevent ubiquitous definition of care even for the same CAM modality. For example, in Australia, osteopaths are nationally registered primary contact health providers, who do not prescribe pharmaceuticals, whereas in the United States, osteopathic physicians possess full medical rights. In addition, our study does not examine efficacy of CAM treatments for back pain thus limiting comparisons between CAM treatments for back pain. The broad definition of CAM and the diversity in the range of CAM modalities between studies investigated pose particular challenge in interpreting the findings. These issues of definitions of CAM and the diversity of CAM modalities are frequently reported challenges in research examining CAM use [1]. The omission of research articles published in languages other than English in this review may also constitute a source of possible bias. Despite these limitations, the evidence analyzed in this review, nevertheless, provides important insights into extent and diversity of CAM use by back pain sufferers.

Prevalence and popularity of CAM use for back pain

Our review reveals a considerable use of CAM by back pain sufferers (see Table 5) with an overall use of CAM ranging from 6% to 76.4% [26,42,44,47,49–52,58,59] and a diverse range of prevalence of CAM practitioner consultations and use of self-prescribed CAM (see Table 4). Our review suggests that back pain sufferers use CAM alongside conventional medical treatments, a finding consistent with research on CAM use among patients suffering from chronic conditions [1]. In contrast with the supportive role (ie, maintenance of general well-being) that CAM seems to play for patients with cancer, diabetes, and other chronic

illnesses [73], CAM use in back pain seems to take a more central role as demonstrated by our review, with back pain as an important determinant for CAM use. Yet, our review showed little evidence for the exclusive use of CAM by back pain sufferers with a prevalence ranging from 1.7% to 20.5% as reported by three studies [42,47,50]. In light of concurrent use of conventional medical care and CAM by back pain sufferers, there is a need for back pain care providers to enquire their patients regarding the manner and order in which they use CAM and conventional medicine and what factors determine how their patients navigate their conventional medical care and CAM use.

Although acknowledging that there is a wide range of CAM usage reported in the reviewed studies (see Table 4), CAM consultations by back pain sufferers were particularly common for chiropractic (mean: 38.11%; median: 37.3%), massage (mean: 30.14%; median: 26.5%), acupuncture (mean: 27.4%; median: 13.3%), and osteopathy (mean: 14.38%; median: 8.4%). Whether back pain sufferers choose chiropractic, massage, acupuncture, or osteopathy as primary treatment or concurrent to conventional medical treatment or in fact because of dissatisfaction with conventional medical care is difficult to ascertain from our review. However, it is interesting to note that these CAM modalities were perceived by their users as effective in the treatment of back pain. However, we do need to remain mindful that such effectiveness is based on self-report only. Meanwhile, systematic reviews on back pain have shown that acupuncture has potential benefit as an adjunct to conventional medical care [74,75], whereas systematic reviews on chiropractic [76] and massage [77] have shown that these modalities are effective when combined with exercise, and a systematic review on osteopathy [34] has reported its long-lasting effects in improving nonspecific low back pain, all of which highlight the benefit of these respective CAM treatments as adjuncts to conventional medicine and/or self-care. Considering that back pain sufferers use both CAM and conventional medicine and that our review also revealed back pain sufferers' increased willingness to receive CAM when provided by GPs, the vast differences in legal and regulatory standards for CAM provision across countries pose challenges as an important health service issue. Furthermore, it is unclear if the integration of certain CAM treatments and conventional medical treatments is predominantly patient driven or directed by clinical guidelines for back pain care incorporating evidence on CAM. The issue of integrating evidence-based CAM and conventional medicine in back pain care needs detailed research examination as it has implications for respective CAM providers, conventional medical care providers, and policy makers in the provision of effective back pain care.

Profile of CAM users and influential factors on decision making for CAM use

The sociodemographic determinants for CAM use by back pain sufferers as revealed by our review displayed a number of findings (see Table 5). Female gender was a

frequently reported determinant for CAM use across the studies reviewed, although it is to be noted that 6 (of 30) articles had female-only samples. The finding that female gender is an important determinant for CAM use is not surprising, as women in general are known to be higher users of health care [29,42,45] than men and also use CAM more frequently than men [29,42,45]. Chronicity of back pain is known to promote active information seeking by back pain sufferers in exploring CAM treatments [78], and family/friends have been reported by studies on CAM use [29,42] as one of the key influential information sources for CAM use. Back pain care providers, therefore, must take particular interest in how female patients with back pain use practitioner-based and/or self-prescribed CAM treatments.

The issue of communication about CAM use

Three (of 30) studies in our review indicate the readiness of a majority of back pain sufferers to disclose CAM use to their GPs (see Table 5). However, the vast majority of studies have not sufficiently examined this issue among back pain patients, and it is difficult to generalize that the disclosure of CAM use is common for back pain sufferers. The issue of disclosure is particularly important considering a substantial prevalence of use of vitamins/minerals (mean value: 54.6%; median: 59.35%) and herbal medicines (mean value: 28.44%; median: 13.1%) as reported by studies reviewed, yet, the sparse evidence on prevalence of self-prescribed CAM treatments for back pain (with only one study reporting self-prescribed CAM treatments). In the context of the wide availability of over-the-counter back pain care products (ie, herbal medicines and vitamins/minerals), it can be expected that nondisclosure of self-prescribed CAM can be a highly important issue of which back pain care providers need to be aware. Relevant health-care professionals should be ready to initiate discussion about use of CAM and identify potential sources of adverse effects especially if their patients are taking substance-based CAM treatments. This is particularly important for those taking herbal medicines for their back pain, as some herbs may lead to adverse effects when combined with use of analgesics [79].

Despite relatively high-quality scoring for methodological rigor across the reviewed articles (Table 2), with a majority of studies using representative and large samples, there remains a pressing need for detailed examination of CAM use in back pain through longitudinal studies employing mixed methods. Indeed, our review showed chronicity of back pain as an important determinant for using CAM and longitudinal studies focusing on patterns of CAM use, integration of CAM with conventional medical treatments by back pain sufferers, factors influencing decision making on types of CAM treatments, effectiveness of CAM treatments, and dynamics of patient and practitioner communication over a period of time will help understand address some key future research questions regarding CAM use and CAM users in back pain.

Conclusions

Contemporary research suggests that CAM use for back pain is common across many countries. This review provides insights into key issues relating to the use of CAM by back pain sufferers and as such highlights the need for back pain care providers and health policy makers to be aware of the prevalence of CAM use, commonly used CAM, factors influencing decision making on CAM use, and other important issues that have implications for care provision for back pain sufferers. Further research using mixed methods is recommended to examine issues still unclear and important for safe and effective treatment in the coordinated care of those suffering from back pain.

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Consultations with complementary and alternative medicine practitioners amongst wider care options for back pain: a study of a nationally representative sample of 1,310 Australian women aged 60–65 years

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Abstract Back pain is a significant health service issue in Australia and internationally. Back pain sufferers can draw upon a range of health care providers including complementary and alternative medicine (CAM) practitioners. Women are higher users of health services than men and tend to use CAM frequently for musculoskeletal conditions. However, there remain important gaps in our understanding of women's consultation patterns with CAM practitioners for back pain. The objective of this study is to examine the prevalence of use and characteristics of women who use CAM practitioners for back pain. The method used was a survey of a nationally representative sample of women aged 60–65 years from the Australian Longitudinal Study on Women's Health. Women consulted a massage therapist (44.1 %, $n=578$) and a chiropractor (37.3 %, $n=488$) more than other CAM practitioners for their back pain. Consultations with a chiropractor for back pain were lower for women who consulted a General Practitioner (GP) (OR, 0.56; 95 % CI 0.41, 0.76) or a physiotherapist (OR, 0.53; 95 % CI 0.39, 0.72) than for those who did not consult a GP or a physiotherapist. CAM practitioner consultations for back pain were greater for women who visited a pharmacist (OR, 1.99; 95 % CI 1.23, 3.32) than for women who did not visit a pharmacist. There is substantial use of

CAM practitioners alongside conventional practitioners amongst women for back pain, and there is a need to provide detailed examination of the communication between patients and their providers as well as across the diverse range of health professionals involved in back pain care.

Keywords Back pain · Complementary and alternative medicine · Health care utilization · Women

Introduction

Back pain burden and the use of CAM amongst a range of treatment options

Back pain is a significant health service issue [1, 2] affecting adult populations in Australia, the US, and the UK [3, 4]. Back pain is the second most common complaint in general practice [5] and presents a major economic burden in Australia with both direct and indirect costs exceeding AUD 8 billion per annum [1, 6, 7]. Surveys report ageing and being female as predictors of debilitating back pain [4, 8], and research has identified 55 % of women aged 56–61 years reporting back pain [9].

CAM use across a range of treatment options for back pain

Use of complementary and alternative medicine (CAM) is common for musculoskeletal conditions [10–12], and women are known to use CAM for back pain [10, 11, 13]. Back pain sufferers can draw upon a range of possible practitioners who comprise three broad provider categories. Conventional medical practitioners core to the biomedical model and medical curriculum (General Practitioners (GPs), orthopedic

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specialists, neurologists, rheumatologists) [11–17], allied health care practitioners, associated with the biomedical model and who traditionally closely assist the conventional medical profession in service provision (physiotherapists, nurses, pharmacists) [13–16, 18], and CAM practitioners not traditionally associated with biomedicine or the medical curriculum (acupuncturists, chiropractors, herbalists or naturopaths, massage therapists, osteopaths, yoga and meditation practitioners, aromatherapists, reflexologists, reiki therapists, traditional Chinese medicine practitioners, craniosacral therapists) [10–21].

Back pain sufferers who use CAM do so alongside seeking care from conventional medical and allied health care providers [12–16], with the occasional exception of exclusive CAM use [13]. US research ($n=808$) on women reported that 41 % of participants suffered back pain, and 34 % of these had used CAM to treat their condition [11]. Back pain sufferers who consult a medical practitioner are more likely to consult a chiropractor or acupuncturist [12] when compared with those who do not consult a medical practitioner. While there is cultural and political variation influencing CAM use across countries, chiropractic, massage, acupuncture, and osteopathy appear to be the most commonly used CAM modalities for treating back pain [12, 14–16].

A US national survey of adults using acupuncture ($n=31,044$) showed 34 % had acupuncture treatments for back pain [19]. Surveys from Europe with comparable population samples report chiropractic as amongst the most common treatments for back pain with prevalence rates around 12–14 % [10, 15]. As for other treatment providers, a survey from a US nationally representative sample found 12 % of back pain sufferers had used conventional health care [22]. An Australian study indicated that 35 % of women aged 56–61 years with back pain consulted a conventional medical practitioner [9]. Another Australian study of adults with back pain reported 25 % as consulting a GP, 13 % as consulting a physiotherapist, 10 % as consulting a pharmacist, and 1 % as consulting a nurse [2].

A lack of clinical base to guide patient decision-making

Studies on the efficacy of treatments for back pain (conventional, allied, and CAM) remain inconclusive [23–29]. The challenge facing back pain sufferers in choosing between the many practitioners available appears exacerbated by the confusion amongst different provider groups regarding each other's respective practices and approaches to back pain care [30]—a confusion which may be due to different practitioner groups holding different beliefs and attitudes towards back pain and its management [3, 15, 18, 22, 31]. As such, there is a lack of clear evidence base to guide patients' decision-making and health-seeking behavior around back pain.

Inter-professional relations across back pain care

Very little is known about the attitudes of conventional medical and allied health care practitioners towards CAM practitioners with regards to back pain care. However, there is research on the general attitude of GPs towards CAM. Australian research suggests GPs perceive acupuncture, massage, and yoga as generally effective and safe [32, 33], and either encourage use or refer patients to these therapies. In contrast, GPs appear to perceive naturopathy, chiropractic, and osteopathy as less effective and potentially more harmful [34] with GPs actively discouraging naturopathy [32]. It is not known whether this is the case with regards to back pain.

A survey of UK GPs identified substantial referrals to CAM practitioners [35] with GPs more likely to refer patients to acupuncturists, homeopaths, and massage therapists, most commonly for musculoskeletal conditions [35] in response to patient requests, when conventional treatments had failed or when certain CAM were seen as effective [35]. A US study identified that GPs did not formally refer patients to chiropractors (despite being generally positive towards chiropractic) [36]. An Australian study identified pharmacists as supportive of CAM and as recommending herbal medicines and supplements frequently for back pain [37]. Other studies highlight the central role of pharmacists in counseling customers on CAM use [38–41] and show nurses as supporting and recommending CAM to their patients [42]. However, it is not known if these results hold for back pain care.

A need for research on CAM use for back pain

Much is known about broader CAM use [15, 43]. For example, women are higher conventional and CAM treatment users than men [10–13, 16, 19], and women using CAM tend to be more educated and have higher income than those who do not use CAM [5, 9, 10, 19, 44]. Whilst in general CAM use by women is higher in urban than rural areas [44], the contrary has been shown in a large study reporting higher use of CAM amongst rural women [45]. However, few studies have investigated CAM use specific to back pain care [10, 15, 18] or differentiated CAM practitioner consultations [10, 15] from self-prescribed CAM treatments for back pain. In response, this paper examines women's consultations with a range of CAM practitioners for back pain in Australia.

Methods

Sample

This research was a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH was designed to investigate multiple factors affecting the health

and well-being of women over a 20-year period. Relevant ethical approval was gained from the Human ethics Committee at the University of Queensland and University of Newcastle, Australia. Women in three age groups were randomly selected from the national Medicare database and invited by mail to participate. The focus of this study is women from the 1946–1951 cohort aged 60–65 years in the sub-study survey conducted during 2011/2012. At the sixth ALSWH survey, 10,011 women consented to participate, and the respondents were shown to be broadly representative of the national population of women in the target age group. For this sub-study, 1,851 women who had indicated in the sixth ALSWH survey (2010) that they had experienced back pain were mailed a questionnaire. Of these women, 1,620 were deemed eligible, and 1,310 (80.9 %) returned completed sub-study questionnaires.

Demographic characteristics

The marital status, urban or rural residence, highest educational qualification the participants had completed, and their spending ability with regard to CAM therapies as reported in the sixth ALSWH survey during 2010 were utilized to extrapolate the demographic characteristics in this sub-study.

Consultations with CAM practitioners

The women were asked if they had consulted CAM practitioners for back pain in the previous 12 months and questioned about the frequency of consultations and the forms of CAM practice they had used (i.e., acupuncturist, aromatherapist, craniosacral therapist, chiropractor, herbalist/naturopath, massage therapist, meditation, yoga, osteopath, reflexologist, reiki therapist, traditional Chinese medicine practitioner, and any other forms of CAM). The women were also asked about their consultations with CAM practitioners for symptoms and conditions relating to back pain.

Conventional medical and allied health care utilization

Women were asked about their visits to conventional medical practitioners including GPs, specialists, and allied health care professionals (physiotherapists, occupational therapists, nurses, pharmacists).

Statistical analyses

Descriptive statistics were employed including frequencies and percentages. Pearson's chi-square tests were used to compare categorical variables. For multivariate analyses, we used logistic regression by using a technique of backward elimination model building. All analyses were conducted using the statistical software package STATA 11.2.

Results

There were 1,310 women who responded to the survey, constituting a response rate of 80.9 %. Of these women, 76.4 % ($n=1,001$) had consulted one or more types of CAM practitioner for back pain in the previous 12 months. Table 1 reports CAM consultations by women for back pain and lists consultations with six specific forms of CAM. From a total of 1,928 consultations with a CAM practitioner, the highest number was with a massage therapist ($n=578$, 41.4 %), followed by a chiropractor ($n=488$, 37.3 %), acupuncturist ($n=174$, 13.3 %), herbalist or naturopath ($n=125$, 9.5 %), meditation or yoga practitioner ($n=124$, 9.5 %), and osteopath ($n=115$, 8.8 %). Women had consulted other forms of CAM practitioner such as reiki therapist, reflexologist, traditional Chinese medicine practitioner, aromatherapist, and craniosacral therapist less frequently ($n=324$, 24.8 %).

Women with no formal education were less likely to consult an acupuncturist for back pain ($p<0.05$). Women residing in urban areas were more likely to use a massage therapist and yoga and meditation practitioner than those in non-urban areas ($p<0.05$) while women who were married or in a de facto relationship were more likely to consult with an osteopath ($p<0.05$) (Table 1).

A comparison of women's consultations with CAM practitioners and their consultations with other health care providers for back pain is presented in Table 2. There were significant, positive associations between consultations with most CAM practitioners and consultations with most conventional health care practitioners. However, the likelihood of consulting with a chiropractor decreased for women who consulted with a GP or a physiotherapist ($p<0.05$).

The women's use of specific CAM modalities for symptoms relating to back pain is provided in Table 3. With the exception of nausea, there were significant, positive associations between experiencing all other symptoms and consultations with most CAM practitioners.

Table 4 shows the results of the multiple logistic regression modeling, identifying the factors associated with CAM practitioner consultations. Women were more likely to consult an acupuncturist if they: consulted with a physiotherapist three or more times in a year (OR=2.12; 95 % CI 1.49, 3.02), compared with women who did not consult with a physiotherapist, experienced headaches (OR=1.53; 95 % CI 1.09, 2.14), compared with women who did not experience headaches; or experienced leg pain (OR=1.52; 95 % CI 1.07, 2.15), compared with women who did not experience leg pain. Women were more likely to consult a chiropractor if they: experienced headaches (OR=1.42; 95 % CI 1.07, 1.89); neck pain (OR=3.12; 95 % CI 2.36, 4.14) or leg pain (OR=1.33; 95 % CI 1.02, 1.73). Women were less likely to consult with a chiropractor if they: consulted a GP one or two times per year (OR=0.70; 95 % CI 0.52, 0.95) or more than three times a year

Table 1 Women's consultations with complementary and alternative medicine (CAM) practitioners for back pain by demographic characteristics

Demographics	Acupuncturist		Chiropractor		Herbalist/naturopath		Massage therapist		Yoga/meditation		Osteopath		Other CAM		Total CAM	
	Yes <i>n</i> =174	No <i>n</i> =1,136	Yes <i>n</i> =488	No <i>n</i> =822	Yes <i>n</i> =125	No <i>n</i> =1,185	Yes <i>n</i> =578	No <i>n</i> =732	Yes <i>n</i> =124	No <i>n</i> =1,186	Yes <i>n</i> =115	No <i>n</i> =1,195	Yes <i>n</i> =324	No <i>n</i> =986	No <i>n</i> =1,001	No <i>n</i> =309
Education^a																
No formal education	15 %	9 %	9 %	11 %	8 %	10 %	11 %	10 %	11 %	10 %	7 %	10 %	10 %	10 %	10 %	11 %
High school	37 %	40 %	39 %	40 %	38 %	40 %	41 %	39 %	39 %	40 %	44 %	40 %	41 %	39 %	39 %	41 %
Trade diploma	23 %	21 %	22 %	21 %	25 %	21 %	20 %	22 %	22 %	21 %	24 %	21 %	22 %	21 %	22 %	20 %
University	25 %	30 %	30 %	28 %	29 %	29 %	28 %	29 %	28 %	29 %	25 %	29 %	27 %	30 %	29 %	28 %
Income																
Difficult to manage	15 %	11 %	11 %	12 %	11 %	12 %	11 %	12 %	13 %	12 %	14 %	11 %	12 %	12 %	12 %	11 %
Sometimes difficult	22 %	22 %	23 %	22 %	28 %	22 %	21 %	24 %	19 %	23 %	20 %	23 %	22 %	22 %	22 %	25 %
Not too bad	47 %	45 %	46 %	44 %	43 %	45 %	47 %	43 %	49 %	44 %	47 %	45 %	48 %	44 %	46 %	40 %
Easy to manage	16 %	22 %	20 %	22 %	18 %	21 %	21 %	21 %	19 %	21 %	19 %	21 %	18 %	22 %	20 %	24 %
Marital status^b																
Married/de facto	74 %	75 %	74 %	75 %	76 %	74 %	75 %	74 %	77 %	74 %	73 %	75 %	73 %	75 %	75 %	74 %
Separated/divorced/widowed	23 %	21 %	23 %	21 %	20 %	22 %	21 %	22 %	21 %	22 %	27 %	21 %	23 %	21 %	22 %	21 %
Never married	3 %	4 %	3 %	4 %	4 %	4 %	4 %	4 %	2 %	4 %	0 %	4 %	4 %	4 %	3 %	5 %
Residence^{c, d}																
Urban	90 %	90 %	91 %	90 %	88 %	91 %	93 %	88 %	84 %	91 %	94 %	90 %	88 %	91 %	91 %	88 %
Rural	10 %	10 %	8 %	10 %	12 %	9 %	7 %	12 %	16 %	9 %	6 %	10 %	12 %	9 %	9 %	12 %

^a Statistically significant association with acupuncturist ($p < 0.05$)^b Statistically significant association with osteopath ($p < 0.05$)^c Statistically significant association with massage therapist ($p < 0.05$)^d Statistically significant association with yoga/meditation ($p < 0.05$)

Table 2 Women's health service utilization and CAM consultations for back pain

Consultations	Acupuncturist		Chiropractor		Herbalist/naturopath		Massage therapist		Yoga/meditation		Osteopath		Other CAM		Total CAM	
	Yes <i>n</i> =174	No <i>n</i> =1,136	Yes <i>n</i> =488	No <i>n</i> =822	Yes <i>n</i> =125	No <i>n</i> =1,185	Yes <i>n</i> =578	No <i>n</i> =732	Yes <i>n</i> =124	No <i>n</i> =1,186	Yes <i>n</i> =115	No <i>n</i> =1,195	Yes <i>n</i> =324	No <i>n</i> =986	Yes <i>n</i> =1,001	No <i>n</i> =309
GP ^{a, b, c, g}																
Never	35 %	45 %	53 %	38 %	29 %	45 %	40 %	46 %	37 %	44 %	44 %	44 %	37 %	46 %	44 %	41 %
1 or 2 times	30 %	24 %	22 %	27 %	29 %	24 %	27 %	24 %	23 %	25 %	22 %	25 %	27 %	24 %	25 %	26 %
More than 3 times	35 %	31 %	25 %	35 %	42 %	30 %	33 %	30 %	40 %	31 %	34 %	31 %	36 %	30 %	31 %	32 %
Orthopedic Surgeon ^{c, e}																
Never	90 %	92 %	93 %	91 %	86 %	92 %	91 %	92 %	87 %	92 %	89 %	92 %	91 %	92 %	92 %	91 %
1 or 2 times	6 %	6 %	5 %	7 %	8 %	6 %	7 %	6 %	9 %	6 %	9 %	6 %	7 %	6 %	6 %	6 %
More than 3 times	4 %	2 %	2 %	2 %	6 %	2 %	2 %	2 %	4 %	2 %	2 %	2 %	2 %	2 %	2 %	3 %
Neurologist																
Never	93 %	96 %	96 %	96 %	95 %	96 %	96 %	96 %	94 %	96 %	95 %	96 %	95 %	96 %	96 %	95 %
1 or 2 times	5 %	3 %	3 %	3 %	2 %	3 %	3 %	3 %	4 %	3 %	4 %	3 %	4 %	3 %	3 %	3 %
More than 3 times	2 %	1 %	1 %	1 %	3 %	1 %	1 %	1 %	2 %	1 %	1 %	1 %	1 %	1 %	1 %	2 %
Rheumatologist																
Never	93 %	94 %	95 %	93 %	90 %	94 %	92 %	94 %	92 %	94 %	94 %	94 %	92 %	94 %	94 %	93 %
1 or 2 times	4 %	4 %	3 %	5 %	5 %	4 %	5 %	4 %	5 %	4 %	3 %	4 %	5 %	4 %	4 %	4 %
More than 3 times	3 %	2 %	2 %	2 %	5 %	2 %	3 %	2 %	3 %	2 %	3 %	2 %	3 %	2 %	2 %	3 %
Physiotherapist ^{a, b, d, e, g, h}																
Never	49 %	65 %	69 %	59 %	65 %	63 %	54 %	70 %	56 %	64 %	65 %	63 %	52 %	66 %	61 %	69 %
1 or 2 times	13 %	13 %	13 %	13 %	12 %	13 %	15 %	11 %	20 %	12 %	15 %	13 %	15 %	13 %	13 %	13 %
More than 3 times	38 %	22 %	18 %	28 %	23 %	24 %	31 %	19 %	24 %	24 %	21 %	24 %	33 %	21 %	26 %	18 %
Occupational therapist ^{c, e, f, g}																
Never	97 %	97 %	98 %	96 %	94 %	98 %	96 %	98 %	94 %	97 %	95 %	97 %	96 %	98 %	97 %	97 %
1 or 2 times	1 %	2 %	1 %	2 %	4 %	1 %	2 %	1 %	3 %	2 %	4 %	1 %	3 %	1 %	2 %	1 %
More than 3 times	2 %	1 %	1 %	2 %	2 %	1 %	2 %	1 %	3 %	1 %	1 %	2 %	1 %	1 %	1 %	2 %
Nurse ^{a, d, e, g}																
Never	94 %	97 %	97	96 %	93 %	97 %	96 %	97 %	93 %	97 %	93 %	95 %	95 %	97 %	96 %	97 %
1 or 2 times	1 %	1 %	1 %	1 %	3 %	1 %	2 %	1 %	5 %	1 %	2 %	1 %	3 %	1 %	2 %	1 %
More than 3 times	5 %	2 %	2 %	3 %	4 %	2 %	2 %	2 %	2 %	2 %	5 %	2 %	2 %	2 %	2 %	2 %

Table 2 (continued)

Consultations	Acupuncturist		Chiropractor		Herbalist/naturopath		Massage therapist		Yoga/meditation		Osteopath		Other CAM		Total CAM	
	Yes <i>n</i> =174	No <i>n</i> =1,136	Yes <i>n</i> =488	No <i>n</i> =822	Yes <i>n</i> =125	No <i>n</i> =1,185	Yes <i>n</i> =578	No <i>n</i> =732	Yes <i>n</i> =124	No <i>n</i> =1,186	Yes <i>n</i> =115	No <i>n</i> =1,195	Yes <i>n</i> =324	No <i>n</i> =986	Yes <i>n</i> =1,001	No <i>n</i> =309
Pharmacist ^{c, d, e, h}																
Never	79 %	78 %	79 %	77 %	62 %	80 %	73 %	82 %	67 %	78 %	73 %	78 %	74 %	79 %	76 %	84 %
1 or 2 times	9 %	10 %	10 %	10 %	12 %	9 %	13 %	7 %	11 %	10 %	12 %	10 %	11 %	10 %	11 %	7 %
More than 3 times	12 %	12 %	11 %	13 %	26 %	11 %	14 %	11 %	22 %	12 %	15 %	12 %	15 %	11 %	13 %	9 %
^a Statistically significant association with acupuncturist ($p<0.05$) ^b Statistically significant association with chiropractor ($p<0.05$) ^c Statistically significant association with herbalist/naturopath ($p<0.05$) ^d Statistically significant association with massage therapist ($p<0.05$) ^e Statistically significant association with yoga/meditation ($p<0.05$) ^f Statistically significant association with osteopath ($p<0.05$) ^g Statistically significant association with other CAM ($p<0.05$) ^h Statistically significant association with total CAM consultations ($p<0.05$)																

(OR=0.56; 95 % CI 0.41, 0.76), compared with women who did not consult a GP; consulted a physiotherapist more than three times a year (OR=0.53; 95 % CI 0.39, 0.72), compared with women who did not consult with a physiotherapist; experienced sleeping problems (OR=0.74, 95 % CI 0.56, 0.99); or experienced muscle spasms (OR=0.74, 95 % CI 0.56, 0.97). Women were more likely to consult a herbalist or naturopath if they: consulted a pharmacist three or more times per year (OR=2.42; 95 % CI 1.51, 3.89), compared with women who did not consult a pharmacist; experienced neck pain (OR=1.7; 95 % CI 1.09, 2.63); fatigue (OR=2.02; 95 % CI 1.32, 3.09); or anxiety and tension (OR=1.83; 95 % CI 1.19, 2.8).

Women were more likely to consult a massage therapist if they: consulted a physiotherapist three or more times a year (OR=2.03; 95 % CI 1.54, 2.69), compared with women who did not consult a physiotherapist; consulted a nurse one or two times per year (OR=4.8; 95 % CI 1.3, 17.69), compared with women who did not consult a nurse; consulted a pharmacist one or two times per year (OR=2.08; 95 % CI 1.4, 3.09), compared with women who did not consult a pharmacist; experienced neck pain (OR=1.94; 95 % CI 1.49, 2.54); arm pain (OR=1.36; 95 % CI 0.02, 1.8); stiffness (OR=1.47; 95 % CI 1.13, 1.92); or anxiety and tension (OR=1.34; 95 % CI 1.01, 1.78). Women were less likely to consult a massage therapist if they: resided in an urban area (OR=0.55; CI 0.36, 0.82); or experienced weakness (OR=0.52; 95 % CI 0.37, 0.73). Women were more likely to consult a yoga and meditation practitioner if they: consulted with a nurse one or two times in a year (OR=3.57; 95 % CI 1.25, 10.18), compared with women who did not consult a nurse; consulted with a pharmacist three or more times a year (OR=2.14; 95 % CI 1.29, 3.54), compared with women who did not consult a pharmacist; or experienced fatigue (OR=1.81; 95 % CI 1.22, 2.7). Women were more likely to consult an osteopath if they: consulted with a nurse three or more times in a year (OR=3.4; 95 % CI 1.29, 8.92), compared with women who did not consult a nurse; experienced neck pain (OR=1.85; 95 % CI 1.16, 2.96); or instability (OR=1.98; 95 % CI 1.07, 3.67). However, women were 0.58 (95 % CI 0.36, 0.92) times less likely to consult an osteopath if they experienced sleeping problems, compared with women who did not experience sleeping problems.

Discussion

This paper presents the first examination of CAM practitioner consultancy patterns for back pain within the context of wider care options from the survey of a large, nationally representative sample of Australian women aged 60 to 65 years. Our analysis identifies four key findings. First, our analysis reveals a high level of CAM practitioner use for back pain with more than three quarters of the women consulting a CAM

Table 3 CAM consultations by women for associated symptoms

Symptoms	Acupuncturist		Chiropractor		Herbalist/naturopath		Massage therapist		Yoga/meditation		Osteopath		Other CAM		Total CAM	
	Yes <i>n</i> =174	No <i>n</i> =1,136	Yes <i>n</i> =488	No <i>n</i> =822	Yes <i>n</i> =125	No <i>n</i> =1,185	Yes <i>n</i> =578	No <i>n</i> =732	Yes <i>n</i> =124	No <i>n</i> =1,186	Yes <i>n</i> =115	No <i>n</i> =1,195	Yes <i>n</i> =324	No <i>n</i> =986	Yes <i>n</i> =1,001	No <i>n</i> =309
Headaches ^{a, b, c, d, e, f, h}	Yes 40 %	28 %	38 %	25 %	41 %	29 %	36 %	25 %	40 %	29 %	39 %	29 %	30 %	30 %	33 %	18 %
	No 60 %	72 %	62 %	75 %	59 %	71 %	64 %	75 %	60 %	71 %	61 %	71 %	70 %	70 %	67 %	82 %
Nausea	Yes 13 %	11 %	12 %	11 %	18 %	11 %	13 %	10 %	13 %	11 %	10 %	11 %	14 %	11 %	12 %	8 %
	No 87 %	89 %	88 %	89 %	82 %	89 %	87 %	90 %	87 %	89 %	90 %	89 %	86 %	89 %	88 %	92 %
Neck pain ^{a, b, c, d, e, f, h}	Yes 70 %	58 %	76 %	50 %	75 %	58 %	71 %	51 %	69 %	59 %	75 %	58 %	64 %	58 %	68 %	33 %
	No 30 %	42 %	24 %	50 %	25 %	42 %	29 %	49 %	31 %	41 %	25 %	42 %	36 %	42 %	32 %	67 %
Leg pain ^{a, b, c, d, f, g, h}	Yes 68 %	55 %	61 %	54 %	69 %	55 %	61 %	53 %	60 %	56 %	66 %	56 %	63 %	55 %	60 %	45 %
	No 32 %	45 %	39 %	46 %	31 %	45 %	38 %	47 %	40 %	44 %	34 %	44 %	37 %	45 %	40 %	55 %
Arm pain ^{a, b, c, d, e, h}	Yes 39 %	29 %	34 %	27 %	38 %	29 %	37 %	24 %	38 %	29 %	35 %	30 %	33 %	29 %	33 %	20 %
	No 61 %	71 %	66 %	73 %	62 %	71 %	63 %	76 %	62 %	71 %	65 %	70 %	67 %	71 %	67 %	80 %
Pins and needles, numbness ^{a, c, d, h}	Yes 40 %	30 %	33 %	31 %	42 %	31 %	35 %	29 %	35 %	31 %	37 %	31 %	34 %	31 %	34 %	24 %
	No 60 %	70 %	67 %	69 %	58 %	69 %	65 %	71 %	65 %	69 %	63 %	69 %	66 %	69 %	66 %	76 %
Stiffness ^{a, c, d, e, g, h}	Yes 57 %	44 %	50 %	43 %	62 %	44 %	54 %	39 %	55 %	45 %	59 %	44 %	49 %	44 %	51 %	30 %
	No 43 %	56 %	50 %	57 %	38 %	56 %	46 %	61 %	45 %	55 %	41 %	56 %	51 %	56 %	49 %	70 %
Fatigue ^{a, c, d, e, g, h}	Yes 31 %	24 %	26 %	24 %	48 %	23 %	28 %	23 %	38 %	24 %	30 %	25 %	31 %	23 %	27 %	20 %
	No 69 %	76 %	74 %	76 %	52 %	77 %	72 %	77 %	62 %	76 %	70 %	75 %	69 %	77 %	73 %	80 %
Weakness ^{c, e}	Yes 22 %	19 %	19 %	19 %	30 %	18 %	19 %	20 %	26 %	18 %	21 %	19 %	21 %	18 %	20 %	16 %
	No 78 %	81 %	81 %	81 %	70 %	82 %	81 %	80 %	74 %	82 %	79 %	81 %	79 %	82 %	80 %	84 %
Depression ^{a, c, d, h}	Yes 26 %	19 %	20 %	19 %	36 %	18 %	23 %	17 %	25 %	19 %	23 %	19 %	22 %	19 %	21 %	15 %
	No 74 %	81 %	80 %	81 %	64 %	82 %	77 %	83 %	75 %	81 %	77 %	81 %	78 %	81 %	79 %	85 %
Sleeping problems ^{a, b, c, d, g}	Yes 40 %	32 %	29 %	35 %	50 %	31 %	37 %	30 %	37 %	32 %	30 %	33 %	40 %	30 %	33 %	30 %
	No 60 %	68 %	71 %	65 %	50 %	69 %	63 %	70 %	63 %	68 %	70 %	67 %	60 %	70 %	67 %	70 %
Instability ^{c, e, f}	Yes 9 %	8 %	7 %	9 %	18 %	7 %	8 %	8 %	14 %	8 %	15 %	8 %	9 %	8 %	8 %	7 %
	No 91 %	92 %	93 %	91 %	82 %	93 %	92 %	92 %	86 %	92 %	85 %	92 %	91 %	92 %	92 %	93 %
Muscle spasm ^{a, c, d, e, f, h}	Yes 42 %	32 %	32 %	35 %	46 %	32 %	41 %	28 %	44 %	33 %	42 %	33 %	35 %	33 %	36 %	25 %
	No 58 %	68 %	68 %	65 %	54 %	68 %	59 %	72 %	56 %	67 %	58 %	67 %	65 %	67 %	64 %	75 %
Anxiety/tension ^{c, d, e, g, h}	Yes 32 %	25 %	26 %	26 %	48 %	23 %	30 %	22 %	37 %	25 %	24 %	26 %	33 %	24 %	28 %	19 %
	No 68 %	75 %	74 %	74 %	52 %	77 %	70 %	78 %	63 %	75 %	76 %	74 %	67 %	76 %	72 %	81 %

^a Statistically significant association with acupuncturist ($p < 0.05$)^b Statistically significant association with chiropractor ($p < 0.05$)^c Statistically significant association with herbalist/naturopath ($p < 0.05$)^d Statistically significant association with massage therapist ($p < 0.05$)^e Statistically significant association with yoga/meditation ($p < 0.05$)^f Statistically significant association with osteopath ($p < 0.05$)^g Statistically significant association with other CAM consultations ($p < 0.05$)^h Statistically significant association with total CAM consultations ($p < 0.05$)

Table 4 Factors associated with use of CAM by women suffering from back pain

	Acupuncturist		Chiropractor		Herbalist/ naturopath		Massage therapist		Yoga/ meditation		Osteopath		Other CAM		Total CAM	
	OR	P values	OR	P values	OR	P values	OR	P values	OR	P values	OR	P values	OR	P values	OR	P values
Are a of residence																
Urban							0.55	0.004	2.05	0.01						
GP use																
Never																
1 or 2 times			0.70	0.02												
More than 3 times			0.56	<0.001											0.66	0.01
Physiotherapist																
Never																
1 or 2 times							1.56	0.01								
3 or more times	2.12	<0.001	0.53	<0.001			2.03	<0.001					1.96	<0.001		
Occupational therapist																
Never																
1 or 2 times													2.8	0.03		
More than 3 times																
Nurse																
Never																
1 or 2 times							4.8	0.02	3.57	0.02						
More than 3 times											3.4	0.01				
Pharmacist																
Never																
1 or 2 times							2.08	<0.001							1.99	0.009
More than 3 times					2.42	<0.001			2.14	0.003					1.99	0.005
Headaches	1.53	0.01	1.42	0.01												
Neck pain			3.12	<0.001	1.7	0.02	1.94	<0.001			1.85	0.01			3.77	<0.001
Leg pain	1.52	0.02	1.33	0.04												
Arm pain							1.36	0.04								
Stiffness							1.47	0.004							1.58	0.003
Fatigue					2.02	<0.001			1.81	0.003						
Weakness							0.52	<0.001								
Sleeping problems			0.74	0.04							0.58	0.02				
Instability											1.98	0.03				
Muscle spasm			0.74	0.03												
Anxiety/tension					1.83	0.01	1.34	0.04					1.56	0.002		

practitioner alongside conventional and allied health care practitioners. The high level of CAM practitioner use for back pain is in line with results from previous studies on CAM utilization amongst women [11] and the wider population [2, 9]. Women's use of conventional medical and allied health care practitioners alongside CAM practitioners suggests that women may take an explorative approach wherein they try out different treatment options due to lack of efficacious treatments. When considered alongside the fact that back pain sufferers often choose not to disclose CAM use to their GP due to presumed GP disinterest or disapproval [11, 43], the possibility of reduced opportunities for optimal

communication between patients and their health care practitioners on treatment options for back pain is highlighted.

Our analysis also shows that the income, educational level, and marital status of the women does not influence their consultations with CAM practitioners or their consultations with other health care practitioners for the treatment of their back pain. This finding contrasts to those from previous studies where higher income and higher education were characteristic of women's CAM usage [11–13, 16]. Although our bivariate analysis shows women with “no formal education” consult acupuncturists less frequently, our stepwise multiple regression model disproved such an association. Back pain

sufferers may consult CAM practitioners due to low availability of efficacious conventional medical treatments for back pain [24, 26] and the possibility of adverse effects associated with pharmaceutical treatments [23, 27]. Additionally, as benefits from CAM treatments and other allied health care options [25, 28, 29] are only short term, back pain sufferers may be explorative in their choices of treatments irrespective of their socioeconomic position. The significant use of CAM practitioners by women alongside conventional medical and allied health care practitioner use raises questions about possible variations in back pain sufferers' notions of effectiveness of treatments, which requires further research.

Our analysis shows no association between women's consultations with CAM practitioners for back pain and their urban or rural residence, except for consultations with yoga and meditation practitioners and massage therapists, wherein women tended to reside in urban areas. Previous research has identified a mixed pattern of CAM use across urban and rural locations with different studies identifying greater use of CAM by women in urban areas [44] and rural areas [45]. Our finding that women who consult a yoga and meditation practitioner or a massage therapist predominantly reside in urban areas highlights the need for further research to determine the role of access to CAM practitioners in women's decision-making regarding their back pain treatment.

Third, our analysis shows women's consultations with chiropractors are diminished with increased consultations with conventional medical practitioners and physiotherapists. Although previous research has suggested conventional medical practitioners and allied health care providers favor chiropractors more readily than other CAM practitioners [12, 36], our finding identifies a potential discordance between GPs and physiotherapists on the one hand and chiropractors on the other. Despite some evidence on inter-professional discordance [34], further research is necessary to examine the extent to which such an assumption of discordance is based on conventional medical and allied health care practitioners' perceptions of the efficacy of chiropractic in back pain care or inter-professional competition in this area of health care provision. Furthermore, our analysis shows that back pain sufferers who consult a GP more frequently seek less help from CAM practitioners, indicating a possible discouragement of CAM use by GPs. This finding does appear to be in line with previous research indicating GP caution regarding CAM treatments for back pain [32].

Fourth, our study reveals women's higher CAM practitioner use for back pain is associated with frequent pharmacist visits. Pharmacists may be a key source of information on CAM for back pain sufferers as previous research has identified pharmacists as supportive of CAM and as having an important role in counseling customers on CAM use [38, 39, 41]. It is likely that pharmacists would be familiar with over-the-counter CAM products for back pain as pharmacists can

sell non-pharmaceutical remedies. However, recent research suggests pharmacists have limited knowledge or confidence in suggesting CAM treatments to customers [38]. Alternatively, the customer and vendor relationship within the context of pharmacist visits may facilitate professional dialogue about CAM decision-making for back pain treatments especially given that pharmacists consider CAM sales an important source of pharmacy income [40]. Further research is necessary to examine the impact of pharmacists on decision-making of back pain sufferers' regarding CAM practitioner use.

The interpretation of our findings is limited by the fact that women's care-seeking for back pain is self-reported by the participants, and the results may be potentially affected by recall bias. Despite this, the ALSWH is a respected source of data for epidemiological research in Australia, and these limitations are countered by the insights provided by the first focused analysis of back pain sufferers' utilization of CAM practitioners amidst other back pain care options.

Conclusions

Our study identifies substantial CAM practitioner use by women with back pain within a broader field of provision, and given the extent of concurrent care identified, there is a need for further research to examine the communication between patients and practitioners as well as across the diverse groups of providers offering back pain care. It is also important that future research investigate the decision-making and information-seeking of back pain patients in relation to the possible use of CAM practitioners amongst other available service providers.

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Disclosures None

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Self-prescribed complementary and alternative medicine use for back pain amongst a range of care options: Results from a nationally representative sample of 1310 women aged 60–65 years[☆]

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KEYWORDS

Back pain;
Complementary and
alternative medicine;
Self-prescribed

Summary

Objective: To examine the prevalence and characteristics of women who self-prescribe complementary and alternative medicine (CAM) for back pain.

Methods: A cross-sectional survey of a nationally-representative sample of women aged 60–65 years from the Australian Longitudinal Study on Women's Health (ALSWH).

Results: A significant number of women (75.2%, $n = 985$) self-prescribed one or more CAM for back pain in the previous twelve months. Use of self-prescribed CAM for back pain was not associated with socio-economic status. The most common self-prescribed CAM used by women was supplements ($n = 776$, 59.2%), vitamins/minerals ($n = 592$, 45.2%), yoga/meditation ($n = 187$, 14.3%), herbal medicines ($n = 172$, 13.1%) and aromatherapy oils ($n = 112$, 8.6%). Women who visited general practitioners (GPs) more than three times in the previous twelve months were 1.59 times (95% CI: 1.14, 2.22) more likely to self-prescribe CAM for back pain than those women who did not visit GPs. Women who visited a pharmacist three or more times in the previous twelve months were 2.90 times (95% CI: 1.65, 5.09) more likely to self-prescribe CAM for back pain than those women who did not visit a pharmacist.

Conclusion: This study identifies substantial use of self-prescribed CAM by women for back pain regardless of their education, income or urban/rural residency. In order to ensure safe, effective practice it is important that all providing and managing health services for back pain sufferers remain mindful of patients' possible use of self-prescribed CAM.

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Introduction

Back pain is a common and debilitating condition^{1–5} with a lifetime prevalence between 60% and 80%.^{1–4} Due to its likelihood of recurrence,^{4–6} chronicity^{4–6} and lack of effective management,^{6,7} self-prescribed CAM for back pain significantly reduces quality of life¹ for sufferers. With an increasing prevalence^{4,5} across developed countries,^{3–5} back pain poses a major socioeconomic challenge now and in the future.^{4,8,9}

Back pain and CAM use

Complementary and alternative medicine (CAM) – both self-prescribed and practitioner-administered – are common amongst patients suffering from painful conditions.^{10–13} Back pain sufferers are known to seek help from a range of treatment providers and tend to use CAM in addition to conventional medical treatments.^{14–18} It is known that women report back pain more than men^{4,5} and longitudinal studies in Australia have identified back pain as a predominant complaint amongst mid-aged women.^{19,20} Women who use CAM are known to be better educated, have higher income, and live in urban areas.^{17,19–21} Research identifies multiple drivers for CAM use including a perception of the importance of individual responsibility in maintaining health,²² of CAM as suitable for treating or preventing chronic health problems²³ and of CAM treatments as natural.^{22,24} Consumerism²² and a sense of personal control²⁴ have also been identified as drivers for CAM use.

Past research has largely investigated patients' use of CAM for painful conditions with few studies specific to CAM use for back pain.^{15–17,25–28} A recent study from Australia reported that substantial numbers of mid-age women with back pain consulted a CAM practitioner (76%), an allied health care practitioner (56%) and/or consulted a biomedical practitioner (59%).²⁹ Another study from Australia reported on some of the common self-prescribed treatments (i.e., vitamins/minerals, herbal medicines and yoga/meditation) amongst women who consulted practitioners for back pain care.¹⁹ In addition, this study noted higher usage of self-prescribed CAM amongst back pain sufferers in comparison to those women who did not suffer from back pain.¹⁹ However to date, the prevalence and characteristics of women self-prescribing different CAM treatments for back pain is poorly understood and yet self-prescribed CAM has been shown to represent a substantial component of CAM use.²⁰ Most studies of CAM usage for back pain either specifically investigate CAM practitioner utilization²¹ or fail to clearly distinguish between self-prescribed CAM and CAM consultations.¹⁶

Health care providers' attitudes towards CAM use

Although it is not clear whether conventional medical practitioners and allied health care practitioners support CAM use for back pain, broader focused research suggests that GPs support certain CAM modalities such as yoga³² and nurses are supportive of CAM treatments in general.^{33,34} An Australian study identified pharmacists as frequently recommending herbal medicines and supplements to customers for back pain.³⁵ However, there is also evidence that pharmacists do

not feel confident to counsel their customers regarding CAM treatments.³⁶

Issues around self-prescribed CAM use for back pain

The evidence base for herbal medicine, vitamins/minerals and supplements in the treatment of back pain is sparse^{30,31}; meanwhile, patients suffering from pain tend to use multiple substance-based remedies¹³ and a large proportion of patients who use CAM treatments do not report their CAM use to their conventional medical practitioners.^{10,11,13} As such, there are serious risks around possible incorrect self-diagnosis, delayed or inappropriate care and potential adverse drug interactions with regards to self-prescribed CAM use for back pain.^{11,13}

Despite knowledge of women's use of CAM for back pain,^{19–21} self-prescribed CAM use for back pain has received marginal focus in literature. Little is known about women's choices of specific forms of self-prescribed CAM treatments for back pain. In response, this paper reports findings from the first empirical examination of prevalence and characteristics of women who use self-prescribed CAM treatments for back pain.

Methods

Sample

The research reported here is a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH was designed to investigate multiple factors affecting the health and well-being of women over a 20-year period starting from 1996. Women in three age groups ('young' 18–23, 'mid' 45–50 and 'older' 70–75 years) were randomly selected from the national Medicare database. These participants have been shown to be broadly representative of the national population of women in the target age group.³⁷ The participants for this current sub-study were chosen from the 1946–51 cohort of women, who had indicated in the sixth ALSWH survey (2010) that they had experienced back pain. Of the 10,011 women who responded to the sixth ALSWH survey, 1851 indicated having experienced back pain and these women were mailed the current sub-study questionnaire. Of those, 1620 were deemed eligible and 1310 (80.9%) women returned the completed questionnaire. The ethics approval for this sub-study was obtained from the Human Ethics Committees at the University of Queensland and the University of Newcastle, Australia.

Demographic characteristics

The demographic information recorded included marital status, area of residence, highest educational qualification completed, and their ability to manage on available income.

Self-prescribed CAM treatments for back pain

The women were asked about their frequency of using self-prescribed CAM treatments for back pain in the previous

twelve months. The CAM treatments included were herbal medicines, vitamins or minerals, supplements (e.g., glucosamine, fish oil), yoga or meditation and aromatherapy oils.

Conventional and allied health service utilization

Women were asked about the frequency of their visits to conventional medical practitioners including GPs, specialists and allied health care professionals including physiotherapists, occupational therapists, nurses and pharmacists.

Statistical analyses

Descriptive statistics were employed including frequencies and percentages. Pearson's chi-square tests were used to compare categorical variables. For multivariate analyses, logistic regression models were used, employing a technique of backward stepwise elimination model building that utilized the likelihood ratio test. For each model, the dependent variable was one of the self-prescribed CAM treatments and the independent variables considered were all of the demographic and healthcare utilization measures. All analyses were conducted using the statistical software package STATA 11.2.

Results

Of the 1310 women who completed and returned the questionnaire – constituting 80.9% response rate – 75.2% ($n=985$) had self-prescribed one or more CAM treatment for back pain in the previous twelve months. Table 1 reports the distribution of self-prescribed CAM use amongst women for back pain by demographic characteristics. The frequency of self-prescribed CAM use was highest for supplements ($n=776$, 59.2%), followed by vitamins/minerals ($n=592$, 45.2%), yoga/meditation ($n=187$, 14.3%), herbal medicines ($n=172$, 13.1%) and aromatherapy oils ($n=112$, 8.5%). Women who were separated, divorced or widowed were more likely to use herbal medicines ($p<0.05$) than those who were married or in a de facto relationship. Women's use of self-prescribed CAM for back pain was not significantly associated with levels of education, income, or urban/rural residency.

A comparison of women's visits to GPs, specialists and allied health care professionals alongside self-prescribed CAM for back pain is presented in Table 2. Women were more likely to use herbal medicines, vitamins/minerals, supplements and aromatherapy oils if they consulted a GP for their back pain ($p<0.05$). Meanwhile, those women who consulted with an orthopaedic surgeon or rheumatologist for their back pain were more likely to use herbal medicines, vitamins/minerals, supplements, yoga/meditation or aromatherapy oils compared to women who did not consult with an orthopaedic surgeon or rheumatologist for their back pain ($p<0.05$). Women who consulted a neurologist for their back pain were more likely to take supplements compared to women who did not consult with a neurologist ($p<0.05$). Women who consulted a physiotherapist were more likely to practice yoga/meditation or take vitamins/minerals or

Table 1 The association between women's self-prescribed CAM treatments for back pain and demographic characteristics.

Demographic characteristics	Herbal medicines		Vitamins/minerals		Supplements		Yoga/meditation		Aromatherapy oils		Other alternative therapies		Total self-prescriptions	
	Yes $n=172$ (%)	No $n=1138$ (%)	Yes $n=592$ (%)	No $n=718$ (%)	Yes $n=776$ (%)	No $n=534$ (%)	Yes $n=187$ (%)	No $n=1123$ (%)	Yes $n=112$ (%)	No $n=1198$ (%)	Yes $n=329$ (%)	No $n=981$ (%)	Yes $n=985$ (%)	No $n=325$ (%)
Education														
No formal	13	10	10	10	9	11	14	9	12	10	12	9	10	10
High school	37	40	38	41	40	40	39	40	38	40	36	41	39	43
Trade diploma	20	21	20	22	20	23	24	21	23	21	25	20	21	20
University	30	29	32	27	31	26	23	30	27	29	27	30	30	27
Income														
Difficult to manage	14	12	12	12	13	11	15	11	14	12	14	11	13	9
Sometimes difficult	27	22	22	23	22	22	24	22	22	22	22	22	22	23
Not too bad	41	45	44	45	44	46	44	45	40	45	48	44	45	45
Easy to manage	18	21	22	20	21	21	17	22	23	21	16	23	20	23
Marital status^a														
Never married	1	4	4	4	4	3	2	4	1	4	3	4	4	4
Married/de facto	74	75	73	76	73	78	78	74	71	75	73	75	73	79
Separated/divorced/widowed	25	21	23	20	23	19	20	22	28	21	24	21	23	17
Residence														
Urban	91	90	90	90	90	90	87	91	91	90	91	90	90	90
Rural	9	10	10	10	10	10	13	9	9	10	9	10	10	10

^a Statistically significant association with other alternative therapies ($p<0.05$).

Table 2 The association between women's self-prescribed CAM treatments for back pain and health service utilization.

Health service utilization	Herbal medicines		Vitamins/minerals		Supplements		Yoga/meditation		Aromatherapy oils		Other alternative therapies		Total self-prescriptions	
	Yes <i>n</i> = 172 (%)	No <i>n</i> = 1138 (%)	Yes <i>n</i> = 592 (%)	No <i>n</i> = 718 (%)	Yes <i>n</i> = 776 (%)	No <i>n</i> = 534 (%)	Yes <i>n</i> = 187 (%)	No <i>n</i> = 1123 (%)	Yes <i>n</i> = 112 (%)	No <i>n</i> = 1198 (%)	Yes <i>n</i> = 329 (%)	No <i>n</i> = 981 (%)	Yes <i>n</i> = 985 (%)	No <i>n</i> = 325 (%)
<i>GP^{a,b,c,e,f}</i>														
Never	21	47	35	51	38	52	42	44	31	45	44	44	39	58
1 or 2 times	29	24	26	24	27	22	23	25	28	25	24	25	27	19
More than 3 times	50	29	39	25	35	26	35	31	41	30	32	31	34	23
<i>Ortho. Surgeon^{a,b,c,d,e,f}</i>														
Never	85	93	90	94	90	94	89	92	85	92	94	92	91	96
1 or 2 times	11	5	7	5	8	4	7	6	12	6	5	6	7	3
More than 3 times	4	2	3	1	2	2	4	2	3	2	1	2	2	1
<i>Neurologist^{c,f}</i>														
Never	94	96	94	97	95	97	94	96	95	96	98	96	95	98
1 or 2 times	4	3	4	2	4	2	5	3	3	3	2	3	4	1
More than 3 times	2	1	2	1	1	1	1	1	2	1	0	1	1	1
<i>Rheumatologist^{a,b,c,d,e,f}</i>														
Never	89	94	91	96	92	96	90	94	88	94	92	94	92	97
1 or 2 times	8	4	6	2	5	2	8	4	8	4	4	4	5	2
More than 3 times	3	2	3	2	3	2	2	2	4	2	4	2	3	1
<i>Physiotherapist^{b,c,d,f}</i>														
Never	56	64	60	65	59	68	52	65	57	63	62	63	60	70
1 or 2 times	15	13	12	14	14	11	18	12	17	13	10	13	14	12
More than 3 times	29	23	28	21	27	21	30	23	26	24	28	24	26	18
<i>Occup. Therapist^{b,d}</i>														
Never	96	97	96	98	97	98	94	98	94	97	99	97	97	98
1 or 2 times	3	1	2	1	2	1	3	1	3	2	1	2	2	0
More than 3 times	1	2	2	1	1	1	3	1	3	1	0	1	1	2
<i>Nurse^{b,d,e,f}</i>														
Never	94	97	95	98	96	97	93	97	90	97	96	96	96	98
1 or 2 times	3	1	2	1	2	1	5	1	6	1	2	2	2	0
More than 3 times	3	2	3	1	2	2	2	2	4	2	2	2	2	2
<i>Pharmacist^{a,b,c,e,f}</i>														
Never	58	81	68	86	73	86	72	79	57	80	77	78	74	91
1 or 2 times	16	9	13	7	12	7	13	9	15	9	8	10	12	4
More than 3 times	26	10	19	7	15	7	15	12	28	11	15	12	14	5

^a Statistically significant association with herbal medicines ($p < 0.05$).^b Statistically significant association with vitamins/minerals ($p < 0.05$).^c Statistically significant association with supplements ($p < 0.05$).^d Statistically significant association with yoga/meditation ($p < 0.05$).^e Statistically significant association with aromatherapy oils ($p < 0.05$).^f Statistically significant association with total self-prescribed therapies ($p < 0.05$).

supplements than women who did not consult with a physiotherapist for back pain care ($p < 0.05$). Women who consulted an occupational therapist for back pain were more likely to practice yoga/meditation than women who did not consult with an occupational therapist ($p < 0.05$). Women who consulted a nurse ($p < 0.05$) were more likely to take vitamins/minerals, practice yoga/meditation or use aromatherapy oils than women who did not consult a nurse for back pain ($p < 0.05$). Women who consulted a pharmacist for their back pain were more likely to use herbal medicines, vitamins/minerals, supplements or aromatherapy oils than women who did not consult with a pharmacist ($p < 0.05$).

Table 3 shows the results of the multiple logistic regression modelling, identifying the factors associated with self-prescribed treatments for back pain. Women were 2.33 (95% CI: 1.46, 3.68) times more likely to use herbal medicines if they consulted a GP once or twice in the previous twelve months compared to women who did not consult a GP and women were 2.92 (95% CI: 1.87, 4.54) times more likely to have used herbal medicines if they consulted a GP more than three times in the previous twelve months compared to women who did not see a GP. Women were 1.40 (95% CI: 1.05, 1.85) times more likely to take vitamins/minerals if they consulted a GP once or twice in the previous twelve months compared to women who did not consult a GP and 1.64 (95% CI: 1.24, 2.16) times more likely to use vitamins/minerals if they consulted a GP three or more times in the previous twelve months compared to women who did not see a GP. Women were 1.62 (95% CI: 1.22, 2.15) times more likely to use supplements if they consulted a GP once or twice in the previous twelve months compared to women who did not consult a GP and women were 1.54 (95% CI: 1.16, 2.03) times more likely to use supplements if they consulted a GP three or more times in the previous twelve months compared to women who did not see a GP. Women were 1.83 (95% CI: 1.18, 2.83) times more likely to practice yoga/meditation for back pain if they had seen a physiotherapist once or twice in the previous twelve months compared to women who did not consult a physiotherapist and women were 1.58 (95% CI: 1.09, 2.27) times more likely to practice yoga/meditation for back pain if they consulted a physiotherapist three or more times in the previous twelve months than women who did not see a physiotherapist.

Women who consulted a nurse in the previous 12 months were 5.70 (95% CI: 2.25, 14.92) times more likely to practice yoga/meditation for back pain compared to women who did not see a nurse and women were 4.35 (95% CI: 1.58, 11.96) times more likely to use aromatherapy oils for back pain than women who did not consult a nurse. Women who consulted a pharmacist once or twice in the previous twelve months were 2.28 (95% CI: 1.55, 3.33) times more likely to use vitamins/minerals, 2.19 (95% CI: 1.35, 3.52) times more likely to use herbal medicines, 2.16 (95% CI: 1.21, 3.84) times more likely to use aromatherapy oils and 1.82 (95% CI: 1.2, 2.72) times more likely to use supplements than women who did not visit a pharmacist. Similarly, women who consulted a pharmacist three or more times in the previous twelve months were 3.27 (95% CI: 1.99, 5.37) times more likely to use aromatherapy oils, 2.71 (95% CI: 1.85, 3.95) times more likely to use vitamins/minerals, 2.42 (95% CI: 1.56, 3.72) times more likely to use herbal medicines, and 2.0 (95% CI: 1.33, 2.98) times more likely to

use supplements than women who did not visit a pharmacist.

Overall, the use of self-prescribed CAM for back pain by women was 1.86 (95% CI: 1.33, 2.6) times more likely if they consulted a GP once or twice in the previous twelve months and 1.59 (95% CI: 1.14, 2.22) times more likely if they consulted a GP more than three times in the previous twelve months. Women self-prescribing CAM were 3.25 (95% CI: 1.79, 5.9) times more likely to do so if they consulted a pharmacist once or twice in the previous twelve months and 2.90 (95% CI: 1.66, 5.09) times more likely to self-prescribe CAM if they consulted a pharmacist three or more times in the previous twelve months compared to women who did not consult a pharmacist.

Discussion

The results of our study suggest that a sizable majority of Australian women aged 60–65 years with back pain self-prescribe CAM. Such a high prevalence of self-prescribed CAM use confirms the popularity of CAM use as indicated in previous studies.^{20,25} It is interesting that previous research focusing upon broader CAM consumption (beyond people with just back pain) has indicated a more extensive use of CAM amongst women with a higher educational level, higher income and urban residence,^{19–21} while these factors did not determine women's use of self-prescribed CAM in our analysis. Our study reveals a high use of supplements and significant use of herbal medicines, vitamins/minerals, aromatherapy oils for back pain, which compares favourably with previous research reporting women's use of self-prescribed CAM more generally.²⁵ Further research is needed to determine the factors influencing women's decision making on self-prescribed CAM use for back pain.

Women's health care utilization alongside self-prescribed CAM treatments for back pain as identified in our study raises important issues regarding back pain sufferers' health seeking behaviour. We are unable to establish from our data whether women self-prescribe CAM treatments concurrently to seeking care from health care practitioners (conventional medical and CAM practitioners) necessitating future research to explore this issue. In addition, further research is needed, as we do not know if women in our study disclosed their use of self-prescribed CAM to their conventional medical practitioners. Previous studies on general use of CAM^{10,11,13} suggest that the concurrent use of multiple treatments is a common occurrence amongst patients suffering from pain and there is significant non-disclosure of CAM use to conventional medical practitioners by patients.¹²

Our analysis shows that women who consulted a physiotherapist or a nurse frequently in the previous twelve months practiced yoga/meditation for back pain. This finding augments results from previous studies, which reported that physiotherapists²⁶ considered yoga as effective for back pain and nurses' generally hold a positive attitude towards yoga.³⁴ Similarly, our study shows that women frequently consulting a nurse are higher users of aromatherapy oils for their back pain and this may reflect nurses' positive attitude towards use of aromatherapy oils, as identified in previous research.³⁴ Investigation detailing allied health care practitioners' attitudes towards patients' use of self-prescribed

Table 3 Factors associated with women's use of self-prescribed CAM treatments for back pain.

Factors	Herbal medicines		Vitamins/minerals		Supplements		Yoga/meditation		Aromatherapy oils		Total self-prescriptions	
	Odds ratio	p-Value	Odds ratio	p-Value	Odds ratio	p-Value	Odds ratio	p-Value	Odds ratio	p-Value	Odds ratio	p-Value
<i>GP use</i>												
Never	—	—	—	—	—	—					—	—
1 or 2 times	2.33	<0.001	1.4	0.019	1.62	0.001					1.86	<0.001
More than 3 times	2.92	<0.001	1.64	0.001	1.54	0.002					1.59	0.006
<i>Rheumatologist</i>												
Never											—	—
1 or 2 times											2.04	0.110
More than 3 times												
<i>Physiotherapist</i>												
Never							—	—				
1 or 2 times							1.83	0.006				
3 or more times							1.58	0.013				
<i>Nurse</i>												
Never							—	—	—	—		
1 or 2 times							5.70	<0.001	4.35	0.004		
More than 3 times							0.64	0.47	0.95	0.93		
<i>Pharmacist</i>												
Never	—	—	—	—	—	—			—	—	—	—
1 or 2 times	2.19	0.001	2.28	<0.001	1.82	0.004			2.16	0.009	3.25	<0.001
More than 3 times	2.42	<0.001	2.71	<0.001	2.00	0.001			3.27	<0.001	2.90	<0.001

CAM for back pain is sparse, and further research is necessary to examine the perceptions of and approach to self-prescribed CAM treatments for back pain amongst this provider group.

Our analysis reveals that frequent visits to a GP are associated with higher use of herbal medicines, vitamins and supplements by women suffering from back pain. However, previous studies report a lack of trust in CAM amongst GPs due to concerns around safety, efficacy and drug interactions.³² Our analysis does not afford us the opportunity to examine if GPs are instrumental in the CAM use amongst these women. However, it may be that women self-prescribing CAM for back pain do so regardless of GPs advice or without even communicating to their GPs about their CAM use. There is a need for further research to explore communication between women and their GPs about self-prescribed CAM use.

Our analysis shows that women who visit a pharmacist frequently are also higher users of vitamins/minerals, herbal medicines, aromatherapy oils, and supplements. This finding complements previous research, which has identified substantial support for CAM amongst pharmacists in line with increasing stock of self-prescribed CAM products in pharmacies.^{35,36} It is not possible for our study to determine if the advice by pharmacists influenced women in choosing self-prescribed CAM treatments. The specific role of pharmacists in relation to self-prescribed CAM for back pain is an issue that requires further research attention.

The interpretation of our study findings is limited due to the use of self-prescribed CAM treatments for back pain being self-reported and therefore the results may be potentially affected by recall bias. Despite this the ALSWH is a respected source of data for epidemiological research in Australia, and these limitations are countered by the insights provided from the first analysis of back pain sufferers' self-prescribed CAM use for back pain amongst a nationally representative sample.

Conclusions

Given the high use of self-prescribed CAM for back pain by Australian women aged 60–65 years identified in our study, it is important that all providers treating back pain (including conventional medical, allied health care and CAM practitioners) remain informed about the likelihood of self-prescribed CAM treatment use amongst their patients. This is an important issue especially considering the potential drug interactions and the danger of inappropriate treatment choices due to self-prescription. There is a need to examine patients' disclosure of self-prescribed CAM in their communication with their healthcare providers.

Conflict of interest statement

No competing financial interests exist.

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Back pain sufferers' attitudes toward consultations with CAM practitioners and self-prescribed CAM products: A study of a nationally representative sample of 1310 Australian women aged 60–65 years

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ABSTRACT

Objective: To analyze back pain sufferers' attitudes toward consultations with complementary and alternative medicine (CAM) practitioners and self-prescribed CAM products.

Methods: A cross-sectional survey of a nationally representative sample of Australian women aged 60–65 years.

Results: A significant number of women with back pain consulted a massage therapist (41.4%, $n = 578$), a chiropractor (37.3%, $n = 488$), an acupuncturist (13.3%, $n = 174$), used self-prescribed supplements (59.2%, $n = 776$), vitamins/minerals (45.2%, $n = 592$) and/or herbal medicines (13.1%, $n = 172$). Women who perceived CAM as providing greater control over their body/health were more likely to have consulted a chiropractor (OR = 4.21; 95% CI: 2.16, 8.19) and/or self-prescribed supplements (OR = 2.38; 95% CI: 1.05, 3.49) than those who did not perceive CAM as providing greater control over their body/health. Women who perceived CAM as natural (OR = 1.56; 95% CI: 1.02, 2.37) or promoting a holistic approach to health (OR = 2.73; 95% CI: 1.60, 4.64) were more likely to have self-prescribed vitamins/minerals than those who did not perceive CAM as natural and promoting a holistic approach to health. Women who expressed that knowledge about evidence of CAM as important to them were more likely to have self-prescribed herbal medicines (OR = 7.15; 95% CI: 1.72, 29.64) than those who did not express an interest in knowledge about evidence of CAM.

Conclusion: Certain key attitudes toward CAM influence back pain sufferers' choice of CAM use, highlighting the need for back pain care providers to ensure appropriate enquiry and discussion with their patients regarding consulting CAM practitioners and/or self-prescribing CAM products for back pain.

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1. Introduction

Complementary and alternative medicine (CAM) encompasses practices and products generally considered to be extrinsic to the dominant conventional medical system.^{1–3} The various CAM modalities have vastly different perspectives and approaches to treating conditions.⁴ Nevertheless, CAM use can be categorized as either 'practitioner based' (e.g., acupuncture) or 'product based' (e.g., vitamins).^{5–7} Prevalence of CAM practitioner consultations and CAM product use has continued to increase in developed

countries^{8–10} with a distinct popularity of CAM use amongst women^{1,6,11,12} along with those who have higher levels of education, higher income and who reside in urban areas.^{7,13} With regard to back pain, concurrent CAM use appears common,^{16–18} where success of treatment by conventional medical care is unclear.^{14,15} Back pain is reported more by women than men and health care utilization is generally higher amongst women than men with back pain.^{19–23} In the year 2010, 76% of Australian women aged 60–65 years consulted a CAM practitioner¹⁷ and 75% used self-prescribed CAM treatments²⁴ for their back pain. Previous literature shows widespread use of CAM for back pain. Consultations with an acupuncturist, a chiropractor or massage therapist for back pain are common across Canada, Australia, Germany, UK and the US.^{17,25–28} Similarly, substantial use of herbal medicines,

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vitamins/minerals and/or supplements by back pain sufferers has been reported internationally.^{6,7,24,29}

Studies of general CAM use report personal beliefs,⁶ a preference for what patients perceive to be 'natural' approaches to treatment,³⁰ a desire to avoid adverse effects of drugs,⁵ and a preference for self-care²³ as important factors influencing decision-making on CAM use. Research on CAM use for back pain has identified factors such as dissatisfaction with conventional medical treatments, long waiting periods for appointments with general practitioners (GPs) and a lack of access to conventional medical care as some of the reasons why back pain sufferers explore CAM treatments.^{16,28,31} An Australian study found that self-perceived benefits of CAM and the approachability of CAM practitioners were also important reasons for back pain sufferers to use CAM.¹⁶ Although chiropractic and acupuncture users internationally have reported the role of these modalities in supporting wellbeing as an important influencing factor in their decision making, it is not known if such attitudes also influence back pain sufferers' choice of chiropractic or acupuncture use in the treatment of back pain.^{32–36} Unfortunately, the role of patients' attitudes and their influence upon back pain sufferers' decision-making with direct regard to CAM practitioner consultations and/or self-prescribed CAM product use remains under-researched. In response to this gap, this paper reports findings drawn from a nationally representative sample of Australian women focussing on the influence of patients' attitudes upon their decision to consult CAM practitioners and/or self-prescribe CAM products for back pain.

2. Methods

2.1. Sample

Participants were recruited from a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH was designed to investigate multiple factors affecting the health and well-being of women over a 20-year period starting from 1996. Women in three age groups (18–23 years [young cohort], 45–50 years [mid-age cohort] and 70–75 years [older cohort]) were randomly selected from the national Medicare database. These participants have been shown to be broadly representative of the national population of women in the target age group in the baseline survey (conducted in 1996).³⁷ The participants for the sub-study reported here were chosen from the mid-age cohort of women, who had indicated in the sixth ALSWH survey (2010) that they had experienced back pain. Of the 1,0011 women who responded to the sixth ALSWH survey, 1851 indicated having experienced back pain and these women were mailed a 50-item sub-study questionnaire. Of those, 1620 were deemed eligible (confirming that they did have back pain) and 1310 (80.9%) women returned the completed questionnaire. Relevant ethical approval was gained from the Human Ethics Committee at the University of Queensland, University of Newcastle and University of Technology Sydney, Australia.

2.2. Back pain sufferers' attitudes toward the use of complementary and alternative medicine

Study participants were asked about their attitudes toward both CAM practitioner use and self-prescribed CAM use for their back pain. The women were asked to indicate their level of agreement or disagreement (i.e., strongly agree, agree, neutral, disagree, strongly disagree) with the following statements: CAM is more natural than conventional medicine; CAM has fewer side effects than conventional medicine; CAM promotes a holistic approach to health; CAM gives more control over health/body; knowledge about evidence of

CAM is important to me as a patient; clinical evidence is important in my choice of CAM; my personal experience of the effectiveness of CAM is more important than clinical evidence; CAM needs to be tested for safety/side effects. In addition to these statements, back pain sufferers who had consulted CAM practitioners were asked to indicate their level of agreement or disagreement (i.e., strongly agree, agree, neutral, disagree, strongly disagree) with the following statements: CAM practitioners spend a longer time with me in consultations when compared with my doctor; CAM practitioners provide more support to me than my doctor does; I find it easier to talk to a CAM practitioner than to a doctor; I have more equal relationship with a CAM practitioner than with doctors; doctors should be able to advise their patients about commonly used CAM for back pain.

2.3. Demographic characteristics

Postcodes were utilized to classify a woman's area of residence as urban or non-urban. Women were asked if they had or did not have private health insurance. If the women reported private health insurance cover, they were further asked if such insurance covered consultations with massage therapists, chiropractors and/or acupuncturists. The women were also asked about their highest educational qualifications completed and their ability to manage on their available income.

2.4. Consultations with CAM practitioners

Women were asked whether or not they had consulted a massage therapist, a chiropractor and/or an acupuncturist for their back pain in the previous twelve months.

2.5. Self-prescribed CAM products for back pain

Women were asked whether or not they had self-prescribed herbal medicines, vitamins/minerals and/or supplements for their back pain in the previous twelve months.

2.6. Statistical analysis

Attitudes about CAM held by those women who consulted a massage therapist, a chiropractor, an acupuncturist and those who self-prescribed herbal medicines, vitamins/minerals or supplements for their back pain were investigated using Student's *t*-test (with mean and standard deviation reported) or Wilcoxon rank-sum test where appropriate. Bonferroni correction was used to adjust for multiple comparisons. Logistic regression models were employed to determine significant predictors of CAM use (i.e., dependent variables), by entering all attitudes toward CAM into the models (i.e., independent variables). In addition, levels of education, area of residence (urban or rural), income and private health insurance status were included in the model as confounders. A backward stepwise elimination process was employed using a likelihood ratio test, to eventually establish the most parsimonious model. Statistical significance was set at $p < 0.05$. All analyses were conducted using statistical software STATA 11.2.

3. Results

Of the 1310 women who answered and returned the questionnaire (a response rate of 80.9%), 41.4% ($n = 578$) had consulted a massage therapist, 37.3% ($n = 488$) had consulted a chiropractor, 13.3% ($n = 174$) had consulted an acupuncturist, 59.2% ($n = 776$) had self-prescribed supplements, 45.2% ($n = 592$) had self-prescribed vitamins/minerals and 13.1% ($n = 172$) had self-prescribed herbal medicines in the previous twelve months for their back pain.

Table 1
Attitude of women toward use of complementary and alternative medicine (CAM) for back pain.

Attitudes toward CAM	Number of responses from 1310 women	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
CAM is more natural than conventional medicine	1278	11	30	46	10	3
CAM has fewer side effects than conventional medicine	1282	13	38	38	9	2
CAM promotes a holistic approach to health	1264	11	36	44	7	2
CAM gives me more control over my health/body	1272	10	32	44	12	2
CAM practitioners spend a longer time with me in consultations when compared with my doctor	1269	13	30	38	16	3
CAM practitioners provide more support to me than my doctor does	1268	9	18	41	26	6
I find it easier to talk to a CAM practitioner than to a doctor	1269	7	13	42	31	7
I have more equal relationship with CAM practitioners than with doctors	1266	7	16	40	30	7
Knowledge about evidence of CAM is important to me as a patient	1262	14	51	29	4	2
Doctors should be able to advise their patients about commonly used CAM for back pain	1273	23	62	12	2	1
Clinical evidence is important in my choice of CAM	1263	16	53	27	3	1
My personal experience of the effectiveness of CAM is more important than clinical evidence	1265	13	32	38	14	3
CAM needs to be tested for safety/side effects	1279	31	50	15	3	1

From those who responded to questions on demographic characteristics, 90% ($n = 1171$) lived in urban areas and 10% ($n = 126$) in non-urban areas. In terms of level of education attained, 10% ($n = 125$) reported having no formal education, 40% ($n = 494$) had high school education, 21% ($n = 264$) had a trade diploma and 29% ($n = 360$) had university education. The majority of women (75%, $n = 969$) were married or in a de-facto relationship, while 21% ($n = 279$) were separated, divorced or widowed and 4% ($n = 49$) were “never married”. In terms of income, 12% ($n = 153$) reported difficulty to manage from available income, 22% ($n = 292$) reported “difficult sometimes”, 45% ($n = 583$) had mentioned “not too bad” and 21% ($n = 272$) had reported “easy to manage”. With regard to private health insurance, 49% ($n = 638$) of the women said that their insurer offered rebates for chiropractic care, 29% ($n = 381$) for acupuncturist care, 28% ($n = 378$) for massage therapy and 24% ($n = 319$) for self-prescribed CAM treatments.

Table 1 reports the attitudes of women toward use of CAM for back pain. Most (85%) agreed that doctors should be able to advise their patients about CAM for back pain, 82% agreed that CAM needs to be tested for safety/side effects, 69% agreed that clinical evidence is important for their choice of CAM, 65% agreed that knowledge about evidence of CAM is important for them as a patient and 51% agreed that CAM has fewer side effects than conventional medicine. Conversely, only 20% of the women agreed that they find it easier to talk to a CAM practitioner than a doctor, 23% agreed that they have more equal relationship with CAM practitioners than with doctors and 28% agreed that CAM practitioners provide more support to them than their doctors.

Table 2 presents the difference in means between women who had consulted and those who had not consulted a CAM practitioner (i.e., massage therapist, chiropractor, acupuncturist). For all of the following statements, those who consulted with the CAM practitioner in question were more likely to agree (i.e., a higher mean score) than those who did not consult with the CAM practitioner: CAM is more natural than conventional medicine; CAM

has fewer side effects than conventional medicine; CAM promotes a holistic approach to health; CAM provides more control over my health/body; CAM practitioners spend a longer time with me in consultations when compared with my doctor; CAM practitioners provide more support to me than my doctor does; I find it easier to talk to a CAM practitioner than a doctor; knowledge about evidence of CAM is important to me as a patient; my personal experience of the effectiveness of CAM is more important than clinical evidence (all $p < 0.004$). The statement that CAM needs to be tested for safety/side effects showed significant difference ($p < 0.004$); where women who had consulted a chiropractor or an acupuncturist had a higher mean score than women who did not consult a chiropractor or an acupuncturist.

Table 3 shows the difference in means between women who had self-prescribed CAM treatment and those who had not self-prescribed CAM treatment for their back pain (i.e., Herbal medicines, Vitamins/Minerals, Supplements). For all of the following statements, those who had self-prescribed CAM treatment in question were more likely to agree (i.e., a higher mean score) than those who did not self-prescribe CAM treatment: CAM is more natural than conventional medicine; CAM has fewer side effects than conventional medicine; CAM promotes a holistic approach to health; CAM provides more control over my health/body; knowledge about evidence of CAM is important to me as a patient (all $p < 0.006$). The statement, clinical evidence is important in my choice of CAM showed significant difference ($p < 0.006$); where women who had self-prescribed vitamins/minerals had a higher mean score than women who had not self-prescribed vitamins/minerals.

The logistic regression analysis (Table 4) demonstrated that women who agreed with the statement ‘as a patient, I have more equal relationship with a CAM practitioner than doctors’ were significantly less likely to consult an acupuncturist (OR = 0.40; CI: 0.22, 0.72) ($p = 0.003$) compared to those that disagreed. Women who agreed with the statement ‘CAM gives me more control over my

Table 2

Comparison of attitudes between those who consulted and those who did not consult complementary and alternative medicine (CAM) practitioners for back pain.

Attitudes	CAM practitioners					
	Massage therapist		Chiropractor		Acupuncturist	
	Yes (n = 578) Mean (SD)	No (n = 732) Mean (SD)	Yes (n = 488) Mean (SD)	No (n = 822) Mean (SD)	Yes (n = 174) Mean (SD)	No (n = 1136) Mean (SD)
CAM is more natural than conventional medicine ^{a,b,c}	0.46 (0.87)	0.21 (0.89)	0.57 (0.87)	0.18 (0.90)	0.54 (0.88)	0.25 (0.90)
CAM has fewer side effects than conventional medicine ^{a,b,c}	0.60 (0.88)	0.34 (0.87)	0.70 (0.85)	0.31 (0.90)	0.74 (0.82)	0.40 (0.89)
CAM promotes a holistic approach to health ^{a,b,c}	0.60 (0.83)	0.28 (0.83)	0.67 (0.80)	0.28 (0.87)	0.65 (0.82)	0.38 (0.86)
CAM provides more control over my health/body ^{a,b,c}	0.48 (0.86)	0.12 (0.86)	0.62 (0.82)	0.10 (0.88)	0.53 (0.92)	0.23 (0.88)
CAM practitioners spend a longer time with me in consultations when compared with my doctor ^{a,b,c}	0.52 (1.01)	0.08 (0.91)	0.50 (1.0)	0.17 (0.93)	0.69 (1.07)	0.18 (0.93)
CAM practitioners provide more support to me than my doctor does ^{a,b,c}	0.11 (1.06)	−0.20 (0.91)	0.17 (1.04)	−0.19 (0.94)	0.16 (1.15)	−0.15 (0.94)
I find it easier to talk to a CAM practitioner than to a doctor ^{a,b,c}	−0.04 (1.04)	−0.33 (0.88)	−0.01 (1.01)	−0.31 (0.93)	−0.09 (1.15)	−0.27 (0.91)
I have a more equal relationship with CAM practitioner than with doctors ^{a,b}	−0.01 (1.06)	−0.29 (0.93)	0.02 (1.04)	−0.29 (0.95)	−0.03 (1.15)	−0.24 (0.95)
Knowledge about evidence of CAM is important to me as a patient ^{a,b,c}	0.85 (0.74)	0.55 (0.86)	0.86 (0.70)	0.57 (0.89)	0.88 (0.69)	0.63 (0.85)
Doctors should be able to advise their patients about commonly used CAM for back pain ^{a,b}	1.10 (0.69)	0.94 (0.77)	1.16 (0.68)	0.93 (0.77)	1.14 (0.72)	0.99 (0.75)
Clinical evidence is important in my choice of CAM	0.82 (0.72)	0.75 (0.81)	0.82 (0.71)	0.76 (0.81)	0.83 (0.76)	0.77 (0.79)
My personal experience of the effectiveness of CAM is more important than clinical evidence ^{a,b,c}	0.47 (0.94)	0.18 (0.96)	0.53 (0.94)	0.18 (0.97)	0.69 (0.91)	0.24 (0.96)
CAM needs to be tested for safety/side effects ^b	1.07 (0.75)	1.14 (0.08)	1.01 (0.78)	1.16 (0.78)	0.96 (0.86)	1.12 (0.78)

Note: Scored: 2 = strongly agree, 1 = agree, 0 = neutral, −1 = disagree, −2 = strongly disagree.

^aStatistically significant association with Massage therapist ($p < 0.004$).^bStatistically significant association with Chiropractor ($p < 0.004$).^cStatistically significant association with Acupuncturist ($p < 0.004$).**Table 3**

Comparison of attitudes between those who self-prescribed and those who did not self-prescribe complementary and alternative medicine (CAM) for back pain

Attitudes	Self-prescribed CAM treatment					
	Herbal medicines		Vitamins/Minerals		Supplements	
	Yes (n = 172) Mean (SD)	No (n = 1138) Mean (SD)	Yes (n = 592) Mean (SD)	No (n = 718) Mean (SD)	Yes (n = 776) Mean (SD)	No (n = 534) Mean (SD)
CAM is more natural than conventional medicine ^{a,b,c}	0.59 (0.91)	0.26 (0.89)	0.54 (0.91)	0.15 (0.86)	0.45 (0.89)	0.16 (0.89)
CAM has fewer side effects than conventional medicine ^{a,b,c}	0.73 (0.87)	0.40 (0.91)	0.63 (0.89)	0.34 (0.91)	0.61 (0.86)	0.24 (0.93)
CAM promotes a holistic approach to health ^{a,b,c}	0.78 (0.82)	0.39 (0.84)	0.65 (0.80)	0.29 (0.87)	0.56 (0.82)	0.30 (0.87)
CAM provides more control over my health/body ^{a,b,c}	0.58 (0.91)	0.25 (0.88)	0.54 (0.86)	0.13 (0.89)	0.47 (0.86)	0.08 (0.91)
Knowledge about evidence of CAM is important to me as a patient ^{a,b,c}	1.04 (0.66)	0.59 (0.84)	0.88 (0.74)	0.49 (0.85)	0.80 (0.76)	0.49 (0.89)
Clinical evidence is important in my choice of CAM	0.85 (0.80)	0.77 (0.79)	0.85 (0.79)	0.73 (0.77)	0.81 (0.76)	0.73 (0.82)
My personal experience of the effectiveness of CAM is more important than clinical evidence ^{b,c}	0.46 (0.95)	0.29 (0.97)	0.51 (0.96)	0.22 (0.94)	0.43 (0.95)	0.21 (0.97)
CAM needs to be tested for safety/side effects	1.18 (0.77)	1.07 (0.80)	1.09 (0.77)	1.11 (0.80)	1.09 (0.77)	1.11 (0.82)

Note: Scored: 2 = strongly agree, 1 = agree, 0 = neutral, −1 = disagree, −2 = strongly disagree.

^aStatistically significant association with Herbal medicines ($p < 0.006$).^bStatistically significant association with Vitamins/Minerals ($p < 0.006$).^cStatistically significant association with Supplements ($p < 0.006$).

Table 4

Women's attitude toward complementary and alternative medicine (CAM) practitioner consultations for back pain.

Factors	Massage therapist (n = 712)			Chiropractor (n = 842)			Acupuncturist (n = 801)		
	Odds ratio	95% C.I.	p-value	Odds ratio	95% C.I.	p-value	Odds ratio	95% C.I.	p-value
CAM is more natural than conventional medicine									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	2.34	1.29, 4.23	0.005	–	–	–	–	–	–
Agree	1.6	0.87, 2.95	0.128	–	–	–	–	–	–
As a patient, I have more equal relationship with a CAM practitioner than doctors									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	0.59	0.37, 0.92	0.022	–	–	–	0.4	0.22, 0.72	0.003
Agree	1	0.60, 1.67	0.984	–	–	–	0.54	0.29, 0.99	0.048
Clinical evidence is important in my choice of CAM									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	–	–	–	–	–	–	6.8	1.45, 31.86	0.015
Agree	–	–	–	–	–	–	4.09	0.91, 18.26	0.065
CAM practitioners spend longer time with me in consultations when compared with my doctor									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	0.69	0.39, 1.19	0.187	0.51	0.31, 0.84	0.009	0.56	0.26, 1.20	0.14
Agree	1.39	0.80, 2.41	0.238	0.68	0.42, 1.10	0.119	1.44	0.72, 2.89	0.299
CAM gives me more control over my health/body									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	–	–	–	2.7	1.42, 5.12	0.002	–	–	–
Agree	–	–	–	4.21	2.16, 8.19	<0.001	–	–	–

Table 5

Women's attitude toward self-prescribed complementary and alternative medicine (CAM) for back pain.

Factors	Herbal medicines (n = 1250)			Vitamins/minerals (n = 1256)			Supplements (n = 1262)		
	Odds ratio	95% C.I.	p-value	Odds ratio	95% C.I.	p-value	Odds ratio	95% C.I.	p-value
CAM is more natural than conventional medicine									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	–	–	–	1.00	0.67, 1.50	0.978	–	–	–
Agree	–	–	–	1.56	1.02, 2.37	0.036	–	–	–
Knowledge about evidence of CAM is important to me as a patient									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	2.99	0.69, 12.96	0.142	–	–	–	–	–	–
Agree	7.15	1.72, 29.64	0.007	–	–	–	–	–	–
CAM needs to be tested for safety/side effects									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	–	–	–	–	–	–	1.89	0.26, 1.20	0.140
Agree	–	–	–	–	–	–	1.92	0.72, 2.89	0.299
CAM gives me more control over my health/body									
Disagree	–	–	–	–	–	–	–	–	–
Neutral	–	–	–	–	–	–	1.64	0.97, 3.66	0.059
Agree	–	–	–	–	–	–	2.38	1.05, 3.49	0.033

health/body' were 4.21 (95% CI: 2.16, 8.19) ($p < 0.001$) times more likely to consult a chiropractor than those that disagreed.

Table 5 shows the logistic regression modelling, identifying attitudes toward CAM associated with self-prescribed CAM product use for back pain. Women who agreed with the statement 'CAM is more natural than conventional medicine' were 1.56 (95% CI: 1.02, 2.37) times more likely to self-prescribe vitamins/minerals than those that disagreed with this statement ($p = 0.036$). Women who agreed with the statement 'CAM promotes a holistic approach to health' were 2.73 (95% CI: 1.60, 4.64) times more likely to self-prescribe vitamins/minerals for their back pain than those that disagreed ($p < 0.001$). Women who agreed with the statement 'knowledge about evidence of CAM is important for me as a patient' were 7.15 (95% CI: 1.72, 29.64) times more likely to self-prescribe herbal medicines than those who disagreed ($p = 0.007$). Women who agreed with the statement 'CAM gives me more control over my health/body' were 2.38 (95% CI: 1.05, 3.49) times more likely to self-prescribe supplements than those that disagreed ($p = 0.033$).

4. Discussion

Drawing upon a nationally representative sample of female back pain sufferers aged 60–65 years, this paper reports the first examination of the influence of women's attitudes toward CAM upon their decisions regarding consulting a range of CAM practitioners and using a range of self-prescribed CAM products. Our analysis identifies three key findings. First, a common view amongst women who consulted CAM practitioners (i.e., chiropractors) and those who self-prescribed CAM products (i.e., supplements) was that CAM gives more control over their health/body. This finding appears to support previous research on CAM use amongst patients managing conditions such as cancer, menopause and other chronic illnesses which has reported patients' choice of CAM as related to their perceptions that CAM allows them more control over their health/body.^{38–40} Back pain, due to its chronicity and subsequent ongoing impact on quality of life, can compel patients to seek treatment approaches that allow them to more actively participate in the management of their illness, thereby providing

a sense of empowerment.⁴¹ Further to this, previous research on CAM use suggests that self-management of back pain is important for back pain sufferers.^{16,42} There is little information on whether and how different CAM modalities may or may not provide control over one's health/body in back pain care, therefore demanding further research. Our findings suggest that the need for control over health/body by back pain sufferers in their illness management requires further in-depth research attention to explore how different CAM modalities may provide a sense of control over the patient's health/body in back pain care and how such experience and perception may provide opportunity and challenge for the broader patient care of back pain sufferers.

Second, our study revealed that women's understandings of CAM as natural and as promoting a holistic approach to health were associated with their use of self-prescribed vitamins/minerals. This finding appears to support previous research, which has found that patients with chronic illnesses (beyond back pain) commonly choose non-pharmacological over-the-counter products with the intention to seek natural approaches to disease management.^{6,24,38} The perception of self-prescribed CAM as natural has often been promoted by popular health information sources.⁴³ There is also evidence that self-prescribing CAM products is perceived by consumers as a way of supporting one's overall health.³⁸ Exercising individual choices and taking responsibility for one's own health beyond conventional medical care may imply a desire for a more holistic approach to health care. Research exploring the motivations of people aged 60 years and above who self-prescribed CAM products showed that these consumers perceived conventional medicine as lacking holism and that their practice of self-prescribing CAM products was linked to exploring ways of filling these perceived gaps in conventional medicine.⁴⁴ Despite such beliefs in holism and/or natural approaches to health, combining self-prescribed CAM products with conventional medicines is a common occurrence amongst patients with chronic illnesses including back pain.^{1,24} Given the possible safety issues around polypharmacy and the opportunity for consumers to purchase CAM products without adequate advice from qualified health professionals, the patients' notion of CAM treatments being 'natural and/or holistic' requires further research attention within the study of back pain patient behaviors and treatment choices.

Possessing knowledge of evidence about CAM was important to those women in our study who self-prescribed herbal medicines. Being inquisitive about evidence for CAM may be an essential aspect of self-prescribing herbal medicines, as the responsibility for product selection, dosage, duration of treatment and knowledge about side effects often falls upon the consumer.⁴⁵ While previous research has shown that chronic illness patients using CAM take an active interest in seeking information about CAM from a variety of sources, – both lay and scientific^{38,46} – the prospect remains that those women self-prescribing herbal medicines may be predominantly dependent upon manufacturers' information on safety and efficacy rather than the advice of a qualified health professional.⁴⁵ This is a potentially challenging situation exacerbated by the fact that previous research cautions against trusting the information on safety and efficacy of herbal medicines in lay media⁴⁷ and that the emerging evidence on herbal medicine⁴⁸ may not necessarily relate directly to consumer products due to the vast majority of efficacy studies focusing upon single herbs while over-the-counter herbal medicines tend to be herbal combinations sold as dietary supplements.⁴⁹ As such, self-prescribing herbal medicines may have serious implications for back pain sufferers, as these patients may be prone to experiment with potentially unsafe and/or ineffective treatments void of guidance from a qualified health professional, whether conventional or complementary.

Future research must examine both the role and trustworthiness of lay media in influencing back pain sufferers' use of self-prescribed herbal products for back pain.

Drawing upon a nationally representative sample of female back pain sufferers and the excellent response rate achieved are strengths of our study. The study provides new insights into women's attitudes toward CAM and their association with the women's decision to use CAM for their back pain. Our study has certain limitations. Interpretation of our findings is limited by the fact that the data is self-reported which may be affected by recall bias as well as social desirability bias. Also, we cannot generalize the findings to Australian women of other ages as our study population had a narrow age range (60–65 years) of back pain sufferers. Nevertheless, our study is the first to draw upon a large nationally-representative sample of women aged 60–65 years who suffer back pain to examine the relationship between women's attitudes toward CAM and their consultation with CAM practitioners and use of self-prescribed CAM products.

5. Conclusion

CAM use is prevalent among women with back pain and back pain care providers need to be aware of their patients' attitudes toward CAM and its impact on self-prescribed CAM use and practitioner-led CAM. Conventional care providers need to help guide their back pain patients toward making responsible and safe treatment choices regarding CAM use.

Conflict of interest

No competing financial interests exist.

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The influence of communication and information sources upon decision-making around complementary and alternative medicine use for back pain among Australian women aged 60–65 years

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What is known about this topic

- A vast range of practitioner-based complementary and alternative medicine (CAM) as well as self-prescribed CAM have become popular among back pain sufferers.
- Non-disclosure of CAM use by back pain sufferers appears common.
- Family, friends and media influence back pain sufferers' decision-making on CAM use.

What this paper adds

- Most of the back pain sufferers in our study felt comfortable communicating with their general practitioner (GP) about CAM use.
- Back pain sufferers utilised both professional and non-professional sources of information for decision-making on CAM use.
- It is important that back pain care providers openly discuss patients' CAM use in order to help back pain sufferers to take informed decisions on relevant CAM treatments.

Abstract

This study examined factors influencing decision-making on complementary and alternative medicine (CAM) use for back pain and back pain sufferers' communication about CAM use. A cross-sectional postal survey was conducted in 2011/2012 as a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The sample contained 1620 women from the 1945–1951 cohort of the ALSWH, aged 60–65 years who were eligible for the sub-study, as they had experienced back pain during 12 months prior to the survey. Of these, 1310 (80.9%) returned completed questionnaires. A significant proportion of women consulted a CAM practitioner (76%, $n = 1001$) and/or had self-prescribed CAM treatment (75%, $n = 985$). Of the women who used CAM for their back pain, 20% consulted their general practitioner (GP) prior to using CAM and 34% always informed their GP following CAM use. Forty-three per cent of the women were influenced by their doctors, 39% by friends/colleagues, 36% by family/relatives, 33% by their partner, 30% by a CAM practitioner, 20% by a pharmacist, 16% by a book/magazine, 11% by mass media, 10% by an allied health worker and 6% by the Internet. Our results show that information sources used by women for their decision-making on CAM use differed according to the symptoms. While non-professional information sources (e.g. family/relatives) positively influenced women in their decision to use CAM for a range of back pain-related symptoms (e.g. headaches/migraines), doctors and allied health workers (e.g. nurses) negatively influenced women in their decision to consult a CAM practitioner for a range of back pain-related symptoms (e.g. headaches/migraines, neck pain). Women seek information from a wide range of professional and non-professional sources with regard to their decision-making around CAM use for back pain. Back pain care providers need to ensure effective communication with their back pain patients regarding safe, effective and co-ordinated back pain care options.

Keywords: back pain, CAM use, communication, decision-making, influential information sources

Introduction

In recent decades, there has been a substantial increase in the use of complementary and alternative medicine (CAM) (Barnes *et al.* 2004, Shmueli *et al.* 2011, Broom *et al.* 2012, Frass *et al.* 2012) – a set of practices and products widely used to support health and well-being but not usually considered to be part of the conventional medical system (Adams *et al.* 2003, 2011). In particular, increasing prevalence of CAM for pain management has been reported across populations in developed countries (Cote *et al.* 2001, Fautrel *et al.* 2002, Ong *et al.* 2004, Broom *et al.* 2012, Murthy *et al.* 2013, 2014) with back pain as one of the most important predictors of CAM use (Cote *et al.* 2001, Broom *et al.* 2012, Kirby *et al.* 2013). Chiropractic, osteopathy, acupuncture and massage therapy are the more commonly used CAM treatments by back pain sufferers besides a vast range of other practitioner-based CAM (Kanodia *et al.* 2010, Murthy *et al.* 2013, 2014, 2015). Herbal medicines, vitamins and supplements have become popular self-prescribed CAM among back pain sufferers (Kanodia *et al.* 2010, Murthy *et al.* 2013, 2014). The use of CAM for back pain is known to be common among middle-aged women who have higher levels of education, who live in urban areas and who have higher income (Sibbritt & Adams 2010, Broom *et al.* 2012).

There is increasing evidence that women with back pain also tend to be higher users of conventional medical care (Burke *et al.* 2006, Wade *et al.* 2008) and the use of CAM for back pain as identified by population-based studies appears to be supplementary to conventional medicine use (Cote *et al.* 2001, Kanodia *et al.* 2010, Kirby *et al.* 2013, Murthy *et al.* 2013, 2014). Clinical guidelines for back pain care remain unclear (Nachemson *et al.* 2000, Van Tulder *et al.* 2000) and the role of CAM in the management of back pain is ill-defined (Weiner & Ernst 2004, Licciardone *et al.* 2005, Rubinstein *et al.* 2011). Although there is some evidence for the effectiveness of manipulative therapies in chronic back pain (Bronfort *et al.* 2004), the evidence for CAM products and medicines such as herbal medicines is poorly understood (Gagnier *et al.* 2007). Despite all these pressing circumstances, we still know little about what influences back pain sufferers' decision-making regarding CAM use. In addition, non-disclosure of CAM use by patients in general appears common (Robinson & McGrail 2004). While some studies report general practitioner (GP) recommendation motivating back pain sufferers to use CAM (Millar 2001, Chenot *et al.* 2007), previous research has also reported family, friends and media as influencing decision-making on

CAM use for various illnesses including back pain (Wade *et al.* 2008, Xue *et al.* 2008). Research into both factors influencing back pain sufferers' decision-making on the use of CAM as well as their communication about CAM use with their healthcare providers remains underdeveloped, especially in terms of previous studies either on the use of CAM in general (including but not specific to back pain) and/or employ small sample sizes. In response to this significant research gap, this paper reports analysis of back pain sufferers' communication about the use of CAM with healthcare providers and factors influencing decision-making on CAM use for back pain-related symptoms among a nationally representative sample of Australian women.

Methods

Sample

The research reported in this paper constitutes a sub-study of the Australian Longitudinal Study on Women's Health (ALSWH). The ALSWH was designed to examine multiple factors affecting the health and well-being of women over a 20-year period starting from 1996. Women in three age groups ('young' 18–23, 'mid' 45–50 and 'older' 70–75 years) were randomly selected from the national Medicare database and the participants were broadly representative of the national population of women in the respective target age group in the baseline survey (Brown *et al.* 1999). The participants for this sub-study were recruited from the 1946–1951 cohort of the ALSWH sample, aged 60–65 years at the time of the sub-study survey conducted during 2011/2012. Of the 10,011 women who participated at the sixth ALSWH survey (during 2010), 1851 women indicated that they had experienced back pain. In 2011, sub-study questionnaires were posted to these 1851 women across Australia. Written informed consent was obtained from the participants for this sub-study in addition to the consent the participants had given to the ALSWH study. Relevant ethics approval was gained from the Human Ethics Committees at the University of Newcastle, University of Queensland and University of Technology Sydney, Australia.

Demographic measures

Marital status, highest educational qualification, income and area of residence (urban or rural) as reported in the sixth ALSWH survey in 2010 were used as participants' demographic characteristics in this study.

Back pain sufferers' communication regarding CAM use

Women were asked if they had consulted their GP or a pharmacist *before* using CAM for their back pain and whether they had informed their GP or pharmacist *after* using CAM for their back pain. Women were asked if they felt able to talk to their GP about their CAM use (if applicable). Women were asked if they had consulted a CAM practitioner and a GP, whether they felt able to talk to their CAM practitioner about their GP consultation for their back pain. Women were also asked if they had consulted more than one CAM practitioner, whether they felt able to talk to one CAM practitioner about their consultation with another CAM practitioner for their back pain. Women were asked if they had self-prescribed CAM treatment for their back pain and had consulted a GP, whether they felt able to talk to their GP about their self-prescribed CAM. Women were asked if they had self-prescribed CAM treatment for their back pain and had consulted a CAM practitioner, whether they felt able to talk to their CAM practitioner about self-prescribed CAM for their back pain.

CAM-related information-seeking behaviour

Women were asked about information sources that were influential in their decision-making on the use of CAM for their back pain. The sources of information included family or relatives, partner, friends or colleagues, Internet, book or magazine, mass media (e.g. newspaper, TV, radio), doctor, pharmacist, allied health worker (e.g. nurse) and CAM practitioner.

Consultations with CAM practitioners

Women were asked about their consultations with chiropractors, acupuncturists, herbalists/naturopaths, massage therapists and osteopaths for back pain.

Back pain-related health concerns

Women were asked: 'During your last period of back pain, did you seek help for any of the following symptoms or conditions relating to back pain?' Information was collected on a range of symptoms associated with back pain including headaches/migraines, leg pain/sciatica, arm pain, pins and needles/numbness, stiffness, fatigue, weakness and sleeping problems. The list of CAM practitioners included a chiropractor, an acupuncturist, a herbalist/naturopath, a massage therapist and an osteopath.

Statistical analysis

The association between influential information sources and CAM practitioner consultations for back pain-related symptoms was investigated using bivariate analysis, specifically, a chi-squared test. Logistic regression modelling was employed to identify the significant information sources predicting consultations with CAM practitioners for back pain-related symptoms. All information sources were entered into a multiple logistic regression model and a backward stepwise elimination process was employed using a likelihood ratio test to help establish the most parsimonious model. Statistical significance was set at $P < 0.05$. All analyses were conducted using statistical software Stata 11.2.

Results

Of the 1851 women to whom the sub-study questionnaire was mailed, there were 5 drop outs from ALSWH, 2 were deceased, 34 women elected not to participate in this sub-study, 1 was overseas and 92 women were ineligible as they did not suffer from back pain at the time of the sub-study survey. Therefore, from a total of 1620 women who were eligible for participating, 1310 women completed the survey representing a response rate of 81%. The majority of women were married or in a de facto relationship (75%, $n = 969$), had at least a high school education (68%, $n = 848$), reported being able to manage on available income (66%, $n = 855$) and resided in urban areas (90%, $n = 1171$).

The majority of women had consulted one or more CAM practitioner for their back pain (76%, $n = 1001$) in the previous 12 months. The prevalence of CAM practitioner consultations for back pain was massage therapist ($n = 578$, 41.4%), chiropractor ($n = 488$, 37%), acupuncturist ($n = 174$, 13%), herbalist or naturopath ($n = 125$, 10%), yoga or meditation practitioner ($n = 124$, 9%), osteopath ($n = 115$, 9%) and other forms of CAM practitioners ($n = 324$, 25%). The other forms of CAM practitioners included reflexologist, reiki therapist, aromatherapist, traditional Chinese medicine practitioner and craniosacral therapist. The prevalence of self-prescribed CAM treatment for back pain by women was 75% ($n = 985$). Women had self-prescribed supplements ($n = 776$, 59%), vitamins/minerals ($n = 592$, 45%), yoga/meditation ($n = 187$, 14%), herbal medicines ($n = 172$, 13%), aromatherapy oils ($n = 112$, 9%) and other alternative therapies ($n = 329$, 25%).

Table 1 shows back pain sufferers' communication regarding CAM use. Of those women who used

Table 1 Back pain sufferers' communication regarding complementary and alternative medicine (CAM) use

Communication	Number of responses	Never (%)	Rarely (%)	Sometimes (%)	Always (%)
Consulted GP before using CAM	855	37	18	25	20
Consulted pharmacist before using CAM	860	49	13	24	14
Informed GP after using CAM	844	26	11	29	34
Informed pharmacist after using CAM	847	61	12	16	11
Felt able to talk to GP about CAM consultation	625	7	12	22	59
Felt able to talk to CAM practitioner about consulting GP	605	9	6	23	62
Felt able to talk to CAM practitioner about another CAM practitioner	472	12	8	32	48
Felt able to talk about self-prescribed CAM to GP	577	4	8	26	62
Felt able to talk about self-prescribed CAM to CAM practitioner	644	11	6	29	54

GP, general practitioner.

CAM for their back pain, 20% had always consulted their GP *before* using CAM and 14% always consulted a pharmacist *before* using CAM. Of the women who used CAM for their back pain, 34% always informed their GP *after* using CAM, and 11% informed a pharmacist always *after* using CAM. Of the women who used CAM and consulted a GP, 59% always felt able to talk to their GP about their CAM use. Of the women who had consulted a GP and had used CAM, 62% always felt they were able to talk to their CAM practitioner about consulting a GP. Of the women who had consulted more than one CAM practitioner, 48% always felt they were able to talk about their CAM consultation with another CAM practitioner. Of the women who had self-prescribed CAM for their back pain, 62% felt always able to talk to their GP about their self-prescribed CAM. Of the women who had self-prescribed CAM and consulted a CAM practitioner, 54% felt always able to talk about their self-prescribed CAM to their CAM practitioner.

Table 2 shows the influential information sources for back pain sufferers regarding their decision-making on the use of CAM. Of those women who used CAM, the most influential information sources upon their decision-making regarding CAM use were: doctors (43%); friends or colleagues (39%); family or relatives (36%); their partner (33%); and/or a CAM practitioner (30%).

Consultation with a CAM practitioner (i.e. chiropractor, acupuncturist, herbalist/naturopath, massage therapist, osteopath) for back pain-related symptoms was common, with 52% ($n = 676$) of women consulting one or more CAM practitioners for a variety of symptoms as shown in Table 3. Bivariate analysis showed that among factors influencing

Table 2 Influence of the different information sources for back pain sufferers regarding decision-making on complementary and alternative medicine (CAM) use

Information source	Number of responses	Influence (n)	Influence (%)
Doctor	1058	452	43
Friends or colleagues	1022	398	39
Family or relatives	1038	375	36
Partner	1004	332	33
Alternative health practitioner	965	288	30
Pharmacist	961	189	20
Book or magazine	958	156	16
Mass media (e.g. newspaper, TV, radio)	955	108	11
Allied health worker (e.g. nurse)	931	92	10
Internet	938	56	6

decision-making on CAM use for back pain-related symptoms, the statistically significant factors (all $P < 0.05$) mostly included family/relatives, friends/colleagues, book/magazine and CAM practitioners. Book/magazine did not influence women in their decision to consult a CAM practitioner for weakness related to back pain ($P = 0.044$). Internet and mass media (e.g. newspaper, TV, radio) had little influence on women's decisions to consult a CAM practitioner for sleeping problems (both $P < 0.05$). Mass media did not influence women in their decision to consult a CAM practitioner for fatigue related to back pain ($P = 0.023$). Women were not influenced by their partners to consult a CAM practitioner for neck pain, stiffness, weakness and sleeping problems (all $P < 0.05$). Doctors, allied health workers (e.g. nurse)

Table 3 Bivariate associations between influential information sources and complementary and alternative medicine (CAM) practitioner consultations for back pain-related symptoms

Influential factors	Headaches/migraines (%)		Neck pain (%)		Leg pain/sciatica (%)		Arm pain (%)		Pins and needles/ numbness (%)		Stiffness (%)		Fatigue (%)		Weakness (%)		Sleeping problems (%)	
	Yes (n = 211)	No (n = 1098)	Yes (n = 529)	No (n = 779)	Yes (n = 425)	No (n = 882)	Yes (n = 210)	No (n = 1097)	Yes (n = 172)	No (n = 1137)	Yes (n = 359)	No (n = 951)	Yes (n = 103)	No (n = 1202)	Yes (n = 93)	No (n = 1216)	Yes (n = 100)	No (n = 1210)
Family or friends	47	34*	39	32*	48	37*	8	6*	25	14*	14	11*	38	44*	15	21*	8	10
Partner	44	30	37	30*	46	34	7	5	20	13	12	11*	40	45	17	22*	9	11*
Friends or colleagues	45	32*	36	32*	46	35*	6	6*	20	14*	13	11*	44	42*	19	20	10	10*
Internet	44	35	38	32	51	36	8	6	30	13	15	11	45	42	23	19	13	9*
Book or magazine	45	35*	38	32*	48	37*	8	6*	24	15*	13	11*	44	43*	19	20*	12	10*
Mass media (e.g. newspaper, TV, radio)	46	32	39	30	48	35	6	6	22	14	13	10	39	44*	15	22	11	10*
Doctor	49	35	39	32	53	38	8	6	32	15	19	11	49	42	16	20	9	10
Pharmacist	51	35	44	32	45	38	5	6	25	16	12	11	40	43	23	19	11	10
Allied health worker (e.g. nurse)	42	36	43	32	51	38	14	5	33	15	24	10	44	43	16	20	12	10
CAM practitioner	47	26*	43	19*	44	22*	46	26*	51	26*	48	22*	56	27*	51	28*	60	27*

* $P < 0.05$.

and pharmacists showed no significant association with women's decisions to consult a CAM practitioner for most of the symptoms related to back pain except that pharmacists influenced women regarding consulting a CAM practitioner for stiffness related to back pain ($P = 0.024$).

The logistic regression models presented in Table 4 show that several sources of information were found to be influential with regard to women's CAM practitioner consultations for specific back pain-related symptoms. Family/relatives had a positive influence on women's decision to consult a CAM practitioner with regard to back pain-related headaches/migraines (OR = 1.71; $P = 0.005$), neck pain (OR = 1.80; $P < 0.001$), leg pain/sciatica (OR = 1.62; $P = 0.002$) and weakness (OR = 2.03; $P = 0.007$).

Women were positively influenced by their partners (OR = 1.58; $P = 0.008$) and friends/colleagues (OR = 1.54; $P = 0.012$) in their decision to consult a CAM practitioner for stiffness related to back pain. Book/magazine sources had a positive influence on women's decision to consult a CAM practitioner for headaches/migraines (OR = 1.82; $P = 0.012$), neck pain (OR = 1.55; $P = 0.039$), arm pain (OR = 2.41; $P < 0.001$), fatigue and sleeping problems (OR = 2.58; $P = 0.002$).

CAM practitioners influenced women positively in deciding to consult a CAM practitioner for all of the symptoms related to back pain: headaches/migraines (OR = 2.78; $P < 0.001$), neck pain (OR = 3.59; $P < 0.001$), leg pain/sciatica (OR = 3.23; $P < 0.001$), arm pain (OR = 2.16; $P < 0.001$), pins and needles/numbness (OR = 2.98; $P < 0.001$), stiffness (OR = 3.35; $P < 0.001$), fatigue (OR = 3.73; $P < 0.001$), weakness (OR = 2.62; $P < 0.001$) and sleeping problems (OR = 3.81; $P < 0.001$).

Doctors and allied health workers (e.g. nurses) negatively influenced women in their decision to consult a CAM practitioner for headaches/migraines (doctors: OR = 0.66; $P = 0.047$; allied health workers: OR = 0.41; $P = 0.018$), neck pain (doctors: OR = 0.59; $P = 0.001$; allied health workers: OR = 0.44; $P = 0.004$) and stiffness (doctors: OR = 0.48; $P < 0.001$; allied health workers: OR = 0.54; $P = 0.039$) related to back pain. Also, doctors negatively influenced women's decision to consult a CAM practitioner for weakness (OR = 0.54; $P = 0.029$). Allied health workers negatively influenced women's decision to consult a CAM practitioner for leg pain/sciatica (OR = 0.50; $P = 0.012$) and fatigue (OR = 0.29; $P = 0.016$). Pharmacists negatively influenced women's decision to consult a CAM practitioner for sleeping problems (OR = 0.40; $P = 0.018$) related to back pain.

Discussion

This paper reports the first examination of the influence of information sources and communication with a range of healthcare providers upon back pain sufferers' decision-making regarding CAM use. Drawing upon a large nationally representative sample of Australian women, our analysis identifies three key findings.

First, our study reveals that the majority of women who consulted a GP as well as used CAM for treating their back pain (through consultations with a CAM practitioner and/or self-prescribing CAM) felt comfortable communicating with their GP about such CAM use. This finding is in contrast to previous research identifying non-disclosure of CAM as a common and important issue among CAM users in general (Robinson & McGrail 2004) and also specifically for pain management (Sleath *et al.* 2008, Gratus *et al.* 2009). However, while communication about CAM use with GPs (before and after using CAM) may be typical for the participants in our study, this finding cannot be generalised across the wider population, as our sample was restricted to only female back pain sufferers aged 60–65 years. Furthermore, we are unable to ascertain from our study whether such open communication with a GP is initiated by the women or their doctors. As such, there is a need for further research to examine patient communication with GPs about CAM use for back pain in more detail drawing from a wider population of back pain sufferers.

Second, women with back pain in our study utilised both professional (predominantly GPs or CAM practitioners) and non-professional sources of information (predominantly friends/colleagues, family/relatives or partner) with regard to their CAM use decision-making. Considering that many women in our study communicated about their CAM use with their GP, it is not surprising that GPs played an influential role in participants' decision-making regarding such use. The high prevalence of consultation with a CAM practitioner for back pain in our study also suggests that CAM practitioners are likely to have had ample opportunity to influence women in using CAM for back pain-related symptoms. Meanwhile, the influential role of family, friends, relatives, colleagues or partners upon women's decision-making regarding CAM use for back pain is perhaps not too surprising given that previous research (beyond back pain) has identified personal experience and recommendations as significant drivers for CAM use (Sherman *et al.* 2004, Chenot *et al.* 2007, Gaul *et al.* 2011) and non-professional information sources play an important role in influencing patients in their decision

Table 4 Logistic regression analyses of influential information sources and complementary and alternative medicine (CAM) practitioner consultations for back pain-related symptoms

Influential factors	Headaches/ migraines (<i>n</i> = 898) OR (95% CI)	Neck pain (<i>n</i> = 896) OR (95% CI)	Leg pain/ sciatica (<i>n</i> = 911) OR (95% CI)	Arm pain (<i>n</i> = 917) OR (95% CI)	Pins and needles/ numbness (<i>n</i> = 964) OR (95% CI)	Stiffness (<i>n</i> = 897) OR (95% CI)	Fatigue (<i>n</i> = 900) OR (95% CI)	Weakness (<i>n</i> = 920) OR (95% CI)	Sleeping problems (<i>n</i> = 899) OR (95% CI)
Family or elatives Partner	1.71 (1.17, 2.49)**	1.80 (1.32, 2.46)***	1.62 (1.19, 2.19)**					2.03 (1.21, 3.43)**	
Friends or colleagues					1.58 (1.12, 2.24)**				
Book or magazine	1.82 (1.14, 2.92)*	1.55 (1.02, 2.37)*		2.41 (1.58, 3.69)***			2.66 (1.53, 4.63)***		2.58 (1.43, 4.65)**
Doctor	0.66 (0.44, 0.99)*	0.59 (0.43, 0.81)***			0.48 (0.34, 0.68)***			0.54 (0.31, 0.93)*	
Pharmacist									0.40 (0.19, 0.85)*
Allied health worker (e.g. nurse)	0.41 (0.20, 0.86)*	0.44 (0.25, 0.77)**	0.50 (0.29, 0.86)*		0.54 (0.30, 0.96)*	0.29 (0.11, 0.79)*			
CAM practitioner	2.78 (1.88, 4.11)***	3.59 (2.53, 5.10)***	3.23 (2.32, 4.49)***	2.16 (1.50, 3.12)***	2.98 (2.06, 4.29)***	3.35 (2.36, 4.76)***	3.73 (2.28, 6.09)***	2.62 (1.55, 4.43)***	3.81 (2.27, 6.39)***

OR, odds ratio; CI, confidence interval.

P* < 0.05, *P* < 0.01, ****P* < 0.001.

to use CAM (Sherman *et al.* 2004, Chenot *et al.* 2007, Gaul *et al.* 2011). It is a cause for concern that non-professional information sources should have such a strong influence on women's decision to use CAM for symptoms associated with back pain, as recommendations by non-professional sources do not guarantee safe and effective choices (Gratus *et al.* 2009).

Third, while professional and non-professional information sources were both influential on decision-making by back pain sufferers with regard to using CAM, all professional sources of information (i.e. GPs, pharmacist, nurse) except CAM practitioners influenced women negatively in their decision-making on CAM use for back pain symptoms. Such negative influence by GPs/allied healthcare professionals on back pain sufferers' choice of CAM for back pain-related symptoms such as headaches/migraines or neck pain may well reflect the current gap in evidence for CAM treatments in the management of these symptoms (Bronfort *et al.* 2004, Evans & Taylor 2006, Mauskop 2007, Furlan *et al.* 2011). Moreover, inter-professional differences among GPs/allied healthcare professionals and CAM practitioners (Norris 2001) may further contribute to GPs/allied healthcare professionals' caution in considering CAM as a treatment option for back pain symptoms. However, it is noteworthy that in countries such as Germany, where it is not uncommon for GPs to receive training in and/or to use CAM treatments in their practice (Chenot *et al.* 2006, 2007, Joos *et al.* 2010), GPs seem to have a more positive attitude towards CAM treatments, especially in the management of pain-related conditions (Chenot *et al.* 2006, Joos *et al.* 2010). Future research is necessary to provide detailed examination of the barriers and promoters for GPs/allied healthcare professionals in recommending CAM treatments in the management of back pain-related symptoms.

Our study has certain limitations. For example, the survey relied on self-reported information by the study participants, which may result in recall bias. In addition, we have used stepwise regression modelling as part of our statistical analyses. This approach has been criticised as potentially producing biased coefficients and unreliable *P*-values (Babyak 2004). As such, caution should be used when interpreting our logistic regression findings. However, such limitations are countered by the opportunity to investigate a large nationally representative sample of women aged 60–65 years with back pain.

Conclusion

Many female back pain sufferers using CAM in our study appear to communicate with their GPs about

such use as well as rely upon both non-professional and professional sources of information in their decision-making regarding CAM use. While family/friends have a positive influence on back pain sufferers' decision to use CAM for symptoms associated with back pain, GPs have a negative influence. It is important that back pain care providers are aware of the drivers for their patients' choices of back pain treatments and be ready to openly discuss patients' CAM use in order to help back pain sufferers by informing them of the relevant evidence base for back pain treatment.

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