Complementary medicine use and health literacy in older Australians

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ABSTRACT

Objectives: to investigate whether complementary medicine (CAM) use is associated with health literacy levels and decision self-efficacy.

Design: a cross-sectional survey was distributed to men and women aged 65 years and older who participated in a randomised control trial (N = 153) in Sydney, Australia.

Results: One hundred and fifty-three people completed the survey of those 66% were females and the mean age was 76 years. Most participants used or were currently using CAM in the past 12 months (75%). The most common source of CAM information were GPs. Participants with higher levels of social support were found more likely to use CAM accessed over the counter (OTC). Participants reporting lower health literacy skills with appraising health information were more likely to use CAM delivered by CAM practitioners. Participants with higher levels of health literacy relating to the domain - "ability to actively engage with health care providers" - were found to use OTC CAM. No relationship was found between participants' decision-making self-efficacy and use of CAM accessed from a CAM practitioner or OTC.

Conclusions: CAM is used by older Australians to maintain their health. Use of CAM was not associated with decision self-efficacy and health literacy. However, CAM users who have less skills with appraising information are possibly more likely to access their CAM from trusted sources such as a CAM practitioners.

1. Introduction

Older Australians are users of high levels of complementary medicine (CAM). However, there is little known about the relationship between health literacy and CAM use in older Australians. To be health literate implies having a range of skills and knowledge about health and health care, including the ability to find, understand, interpret, and communicate health information, seek appropriate care, and make critical health decisions.[1] High levels of health literacy and self –efficacy are important steps on self-care behaviours and health outcomes.[2] CAM include a diverse range of modalities to promote, treat and maintain wellbeing and health.[3] It refers to different types of clinical practices such as massage therapy, neuropathy, acupuncture and common products purchased in pharmacies such as herbal medicine and homeopathy not associated with conventional medicine.[3,4]

Australians are increasingly using CAM to either improve or maintain good health or to reduce stress.[5] A national survey of CAM used by older Australians (65 years and older) found 77.8% of the participants had used at least one of the 17 common forms of CAM in the 12 months preceding the survey. [6] Older Australians make up a significant

composition of the population. In 2016, over 1 in 7 people were over the aged 65 and over, around 3.7 million Australians.[7] It is projected that by 2056 there will be 8.7 million older Australians that will be aged 65 and over.[7]

In Australia, "complementary medicines" include: medicinal products containing ingredients such as minerals, nutritional supplements, vitamins, herbs, homoeopathic and certain aromatherapy preparations. Since most of these fall into the category of low-risk complementary medicines the regulatory agency the Therapeutics Goods Administration (TGA) assesses them for safety and quality only not efficacy. This is seen as a critical problem as well as self-regulations which sees claims made with no scientific support.[8] For vitamins depending on the dose or on the vitamin they are regulated either as prescription medicines or as complementary, over the counter (OTC) medicines. Most products are widely available in health food stores and pharmacies. Apart from chiropractors and osteopaths and Chinese medicine practitioners, there is no standardised national system for regulating other complementary medicine practitioners in Australia. The extent and typeof regulation varies from state to state and from one complementary medicine profession to another. Most complementary

medicine disciplines are self-regulated by the profession.

The use of CAM in older Australians is of particular interest because several variables associated with old age such as polypharmacy, multiple comorbid illnesses and physiological changes, can increase the risk of adverse drug reactions. Although most CAM is considered to be safe and some is evidence-based there is still an apprehension of lack of consistent information and issues regarding regulation.[9,10] Evidence from recent research illustrates the substantial prevalence and complexity of CAM use amongst older people. It is important that all providers need to enquire with their older patients about the use of these other medications as survey findings indicate widespread of CAM use in Western societies.[11–13]

Introduced in the 1970′s the term health literacy (HL) refers to "the degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions".[14,15(p16)] Studies have shown that HL skills are associating with disease self-management and knowledge.[16–19] Health literacy, along with CAM use, has also been associated with health behaviour in studies among patients with chronic illnesses.[20] Compared to other aged groups, older adults have different communicative needs and desires. The have unique social, physiological, and cognitive issues which could directly and indirectly affect their own health literacy.[21] Fostering health literacy may contribute to healthy ageing, for example supporting well-informed CAM decisions. Being highly self-efficacious is key to being engaged with self-care and self-management. The concept of self-efficacy originates from 'Social Learning Theory' and is defined as people's beliefs in their capability to organize and execute the course of action required to deal with prospective situations.[22] Self-efficacy, is confidence in one's ability to improve the quality of health decision making or the belief that one can self-manage one's own health.[23] However, the relationship of decision-making self-efficacy with use of CAM is under-researched.

We conducted a randomised controlled trial (RCT) examining the effectiveness of educational interventions to improve health literacy and decision self-efficacy.[24] The aim of this secondary study was to investigate whether CAM use is associated with health literacy levels and decision self-efficacy.

2. Methods

2.1. Participants' selection and recruitment

The study population was comprised of men and women aged 65 years and older who participated in a randomised control trial (RCT). The RCT explored the effectiveness of a CAM educational intervention to increase older adults' decision-making efficacy and health literacy using a web or DVD plus booklet format. The RCT was conducted between July 2016 and January 2017, in Sydney, Australia. The study population, rationale, trial design and the intervention have been described in detail elsewhere.[24] In brief, people were eligible to participate if they were aged 65 years and older, with access to the Internet or a DVD player or computer, and able to provide informed written consent. Exclusion criteria included: unable to communicate in English or living in a long-term care facility. The main outcome measure for the RCT was decision self-efficacy to estimate a moderate effect a minimum sample size of 70 per group was required. All participants in the RCT completed the self-administered questionnaires.

Participants were recruited from a community setting comprised of retirement villages and community groups, including senior citizen clubs and associations. Diverse recruitment strategies were used including letter box drops, and promotional talks by the investigators and trial co-ordinator at the retirement villages. At these visits, following a promotional study presentation, expressions of interests were gathered and participant information and consent forms made available. A mutually convenient time was made to obtain informed consent and to complete baseline questionnaires.

2.2. Instruments

2.2.1. Survey

The survey was administered at baseline and explored CAM use, type of CAM therapies, main sources of information about CAMs and disclosure to their general practitioners (GPs) measured using yes/no responses. Participants were also asked about their perceptions of safety and efficacy of CAM. A list of individual CAM modalities were included in the questionnaire to examine patterns of use. Inclusion of CAM were based on commonly used modalities reported in previous surveys of older people using CAM.[6,25–27] Demographic data were also collected using the same categories as the 2016 Australian Census to allow comparisons.

2.2.2. Decision self-efficacy scale

The decision self-efficacy scale[28] is an 11-item instrument that assesses self-confidence or belief in one's ability to make decisions, including an ability to participate in shared decision-making. It consists of 11 five-point scale statements ranging from 0 = "not at all confident" to 4 = "very confident". It has an alpha coefficient of 0.92.[28]

2.2.3. Health literacy

Health literacy was measured using the Health Literacy Questionnaire (HLQ).[29] The HLQ is a validated instrument that contains a total 55 questions grouped into nine domains focusing on various health literacy aspects. Each domain includes four to five items, with participant's indicating their response along a Likert type scale with response options ranging from "1 very difficult to 4 very easy", or along a five-point scale was ranging from "strongly agreed to strongly disagreed." The domains evaluated include: feeling understood and supported by healthcare providers, having sufficient information to manage personal health, an ability to actively manage personal health, social support for health, appraisal of health information, ability to actively engage with health care providers, navigating the health care system, ability to find good health information, and understanding health information well enough to know what to do. The HLQ has strong psychometric properties, is grounded in the individual's lived experience, and is validity driven.[29] Reliability testing was examined using Raykov's procedures rather than Cronbach's alpha where > 0.80 was sought. This was achieved for eight of the nine scales; the lowest reliability estimates were achieved for the appraisal of information (0.77).

2.3. Pilot testing

The survey was pilot tested with four participants from a retirement village who met the RCT eligibility criteria i.e were aged 65 years and older, with access to the Internet or a DVD player or computer, and able to provide informed written consent. The study coordinator recruited these participants from different community settings. Respondents were advised that the purpose of the pilot test was to improve the questionnaire and were asked to critically evaluate it. After the pilot was completed, small wording and skip logic changes were undertaken.

2.4. Data analysis

Data from the paper copies were entered manually into the electronic REDCap data management system by the trial co-ordinator. Descriptive statistics were used to summarise the data. Frequencies and proportions were calculated. To test the associations, a chi-square (χ^2) test or Fischer's exact test (where appropriate), and analysis of variance (ANOVA) was used to examine differences between multiple groups. For bi-variate analyses CAM modalities were categorised to those that were available over the counter, practitioner provided, or could be a mixture of both. Significance was set at the five per cent level. Statistical analyses were performed with SPSS software (version 24; SPSS Inc, Chicago, IL).

Table 1
Characteristics of participants.

Characteristics	Data from the trial n = 153 n (%)	Australian census data[b] n = 3,676,765 n (%)	p value
Sex			
Male	51 (33.3)	1,704,376 (46.4)	< 0.001
Female	102 (66.7)	1,972,383 (53.6)	
Age (n = 151) (M ± SD)[a]	76 (± 6.92)		
Marital status (n = 152)			
Single	14 (9.2)	183,913 (5.0)	0.02
Married/defacto	85 (55.9)	2,129,158 (57.9)	0.30
Widowed	34 (22.4)	818,501(22.3)	0.53
Divorced/ Separated	19 (12.5)	545,193 (14.8)	0.23
Live alone (n = 152)			
No	90 (59.2)		
Yes	62 (40.8)		
Country of birth			
Australia	103 (67.8)	2,109,308 (57.4)	0.01
United Kingdom	25 (16.4)	365,813 (10.0)	
Other	24 (15.7)	1,201,641 (32.7)	
Speak English at home			
Yes	153 (100)	2,790,603 (76.0)	< 0.001
Aboriginal and Torres Strait Islander			
No	149 (98)	618,822 (83.2)	< 0.001
Highest level of education			
Primary school or less	1 (0.7)		
High school (not completed)	21 (13.7)	2,077,403 (56.5)	< 0.001
High school (completed)	38 (24.8)	1,047,199 (28.5)	0.18
TAFE/Trade	36 (23.5)	708,470 (19.3)	0.11
University undergraduate	40 (26.1)	289,894 (7.9)	< 0.001
University postgraduate	17 (11.1)	138,256 (3.8)	< 0.001
Employment status			
Retired	139 (90.8)	2,896,440 (78.8)	< 0.001
Annual household income/year			
< 20,000	26 (17.1)		
$20,000-39,999	60 (39.5)		
$40,000-59,999	19 (12.5)		
$60,000-75,999	12 (7.9)		
> $80,000-99,999	1 (0.7)		
100,000-149,999	3 (2.0)		
Prefer not to answer	31 (20.3)		

^a M = mean SD = standard deviation.
^b Total number of people 65 and over (Census 2016 = 3,676,762).

2.5. Ethics

Ethical approval was granted by the Human Research Ethics Committees of Western Sydney University [H11361] and the University of Notre Dame, Australia [014145S].

3. Results

3.1. Characteristics of participants

One hundred and ninety-three people met the eligibility criteria for the study of which 153 participants gave consent and joined the study. Most participants were born in Australia (68%), they all spoke English at home and almost one third had a university degree (37.2%) (see Table 1). Our population was compared with data from the 2016 Australian Census, and we found our sample had a greater representation of women, those describing themselves as single, participants born in Australia, spoke English at home, were retired, had a higher level of education and an under representation of Aboriginal and Torres Strait Islander peoples.

The self-reported health status and health characteristics of the participants are listed in Table 2. A small percentage of participants (17%) did not report a health problem. The most comment health problem reported was arthritis (50%) and a third of participants

Table 2
Health characteristics of the study participants.

Characteristics n = 153	n	%
Current health status[a]		
No health problem	26	17.0
Arthritis	76	49.7
Heart problems	40	26.1
Back pain	41	26.8
Asthma	22	14.4
Diabetes	19	12.4
Cancer	19	12.4
Stroke	3	2.0
Attended a hospital emergency dept in past 12 months		
No	123	80.4
Current health status		
Excellent	7	4.6
Very good	58	37.9
Good	63	41.2
Fair	22	14.4
Poor	3	2.0

^a Participants could choose more than one option.

indicated heart problems (26%) and back pain (27%). Most participants had not attended a hospital emergency department in the past 12 months (80%) and most reported either very good (38%) or good (41%) health.

3.2. Use of CAM and views of study participants

Most participants used or were currently using CAM in the past 12 months (75%). The CAM modalities used varied with vitamins (51%) and minerals (35%) the most commonly used. The three most common sources of health information for CAMs were GPs (Table 3), followed by family and friends (28%) and pharmacists (26%). Almost one third of participants (29%) consider CAM as "effectiveness as conventional medicine" and nearly half (41%) describe CAM "equally safe" compared to traditional medicine. No relationship was found between CAM use of source of CAM information.

3.3. Use of CAM, decision making self-efficacy and health literacy

CAM use or not was not found to be associated with any health literacy domain or confidence in making a decision (data not shown). For those participants who currently reported using CAM, we categorised the types of CAM used into three groups; practitioner delivered/administered CAM (acupuncture, massage etc.), over the counter products (OTCs) (nutritional supplements), or a mixture of use of OTC and practitioner administered CAM (Table 4). Three domains of health literacy were associated with who/where CAM was accessed:

1 Participants with higher levels of social support were found more likely to use CAM accessed over the counter.
2 Participants reporting lower health literacy skills with appraising health information were more likely to use CAM delivered by CAM practitioners.
3 Participants with higher levels of health literacy relating to the domain an ability to actively engage with health care providers were found to use OTC CAM.

There was no relationship on six domains. No relationship was found between participants' decision-making self-efficacy and use of CAM accessed from a CAM practitioner or OTC CAM. No relationship was found between CAM use and any health literacy domain and self-efficacy.

Table 3
CAM use and information about CAM.

	n	%
Used CAM or currently using CAM	114	74.5
Discussed CAM use with medical practitioners	83	54.2
Main sources of information on CAM[a]		
General practitioner (GP)	64	56.6
Pharmacist	39	25.5
Family/friends	42	27.5
Internet	27	17.6
Magazines	26	17.0
Specialist	17	11.1
Others[b]	10	6.5
CAM modalities		
currently used (mean SD)[a]	113	2.46 (1.66)
Vitamins	78	51.0
Minerals/Food supplements	54	35.3
Massage	21	13.7
Herbal medicine	17	11.1
Acupuncture/acupressure	13	8.5
Tai Chi	16	10.5
Chiropractor	12	7.8
Yoga	14	9.2
Meditation	18	11.8
Osteopathy	9	5.9
Qigong	6	3.9
Relaxation Techniques	6	3.9
Others ±	21	13.7
Views on effectiveness of CAM compared to conventional medicine		
More effective	13	8.5
Equally effective	47	28.8
Less effective	28	18.3
Don't know	37	44.4
Views on safety of CAM compared to traditional medicine (n = 114)		
Safer	11	9.6
Equally safe	47	41.2
Less safe	19	16.7
Don't know	37	32.5

[a] Participants could choose multiple options.
[b] Others included: book, herbalist, dietitian, naturopath, osteopath and physiotherapist. ± Others: aromatherapy (4), Bach flowers, Chinese herbal medicine, art therapy (3); laser therapy, magnet therapy (2); hypnotherapy, myofascial release, homeopathy, trigger point therapy (1).

4. Discussion

The purpose of the study was to investigate whether CAM use is associated with health literacy levels and decision self-efficacy.

Although this population had moderate levels of self-efficacy and health literacy, use of CAM was not found to be associated overall with decision self-efficacy and the majority of health literacy domains. The domain of social support from family and friends was associated with greater use of CAM from OTC, our data also highlights this social support provided information to participants, as well as general practitioners. Findings also demonstrated high use of CAM by older Australians.

Research clearly highlights that CAM is highly valued by older Australians. The experience of using CM has been described as enabling, 'allowing individuals to get on with life'[30] Further the importance of keeping active and being able to do normal things is viewed as central to maintaining independence and wellbeing. A further benefit articulated by CAM users describes CAM as offering empowerment by encouraging individuals to participate in their health through lifestyle changes and providing a safe environment in which to explore how to lead a better life.[30] Our findings therefore are relevant in light of relevant Australian policy documents relating to the older Australian. The national strategy for quality use of medicines identifies health care consumers are responsible for asking for and utilising objective information, resources and services to make decisions and take actions that enable medicines, when they are required, to be chosen and used wisely; becoming more aware of the risks and benefits of medicines, the possibility of non-drug options and the importance of a healthy lifestyle; developing skills and confidence to use medicines appropriately and seeking help to solve problems when they arise; and becoming more aware of the place of medicines in the broader context of health services and society[31]

Our data showed a high rate of CAM use in this population. High rates of CAM use has also been reported among older Japanese adults (74%[32]) and older white Americans (61%[32] and 80%[20]). However as described by Posadzki et al,[33] differences in survey instruments and methodologies make comparisons hard. In a review by Willison high rate of use was reported amongst older people who have a medical condition.[34] Our findings suggest CAMs are an important part of their self-care to maintain their health. The most commonly used CAM were vitamins and minerals.

Information on CAM was accessed from a variety of sources. General practitioners (GPs) were the primary provider of information about CAM, although, 25% of older Australians accessed information over the internet. However disclose of CAM use to the GP in this study was higher than reported elsewhere.[10,35,36] This finding has positive implications for multiple care practitioners, as well as multiple medicine

Table 4
Levels of health literacy and decision making efficacy by use of over the counter products vs practitioner delivered CAM.

	Over the counter (OTC) products (mean SD)	Practitioner provided CAM (mean SD)	Use of both OTC and practitioner CAM (mean SD)	p value
Decision making self-efficacy (n = 36/19/35)	73.8 12.0	71.29 17.52	74.41 12.84	0.71
Health literacy domain (n = 46/22/46)				
Feeling understood and supported by health care providers	3.370.47	3.15 0.39	3.33 0.55	0.23
Having sufficient information to manage my health	3.04 0.60	2.78 0.56	3.000.50	0.18
Actively managing my health	3.190.52	2.900.42	3.150.52	0.14
Social support for health	3.19[a]0.53	2.810.50	3.130.52	0.02[a,b]
Appraisal of health information	3.000.47	2.700.40	3.090.46	0.006[c,d]
Ability to actively engage with health care providers	4.140.47	3.740.70	4.030.54	0.01[e,f]
Navigating the health care system	3.960.54	3.650.70	3.850.58	0.15
Ability to find good information	3.860.57	3.680.58	3.930.48	0.19
Understand health information well enough to know	4.160.54	3.930.58	4.130.52	0.24

Adjusted analyses using LSD undertaken for multiple comparisons. Social support for health: [a]OTC vs practitioner provided CAM p = 0.007, [b]OTC plus practitioner provided CAM vs practitioner provided CAM p = 0.021. Appraisal of health information: [c]OTC vs practitioner provided CAM p = 0.13, [d]OTC plus practitioner provided CAM vs practitioner provided CAM p = 0.001. Ability to actively engage with health care providers: [e]OTC vs practitioner provided CAM p = 0.005, [f]OTC plus practitioner provided CAM vs practitioner provided CAM p = 0.048.

that affect the wellbeing of older people with chronic conditions. These findings highlight that all healthcare practitioners should be aware of the choices of treatment made by their clients to enable the best care is provided to consumers. Almost half believed CAM were as safe as conventional medicine and one third considered them as effective. Our data is similar to what has been reported elsewhere. A cross-sectional survey conducted in Germany with people aged 70 and older found that a 61% were users of CAM.[37] However unlike our sample their main source of information were family and friends.

Low health literacy has been associated with poorer treatment outcomes, including poor compliance with medication, increased admissions to emergency departments, lower ability to interpret labels and health messages, reduced health status, and increased mortality among the elderly.[24] There have been few studies of health literacy among CAM users. A cross sectional survey study by Smith et al,[38] using a validated health literacy questionnaire and follow-up interviews with 11 residents of retirement villages found health literacy was greater for competencies relating to *having sufficient information to manage their health; felt understood and supported by health care providers; actively managed their health; and having social support for health.* Three health literacy were low including appraisal of health information; ability to find good information; and navigating the health care system. The findings suggest that participants had different experiences navigating the health care system to access information and services relating to complementary medicines. Participants in this study also spoke about the barrier to obtaining good information and their attempts to appraise and make sense of information from multimedia sources including the radio, television, the internet, and books, as well as health professionals and family and friends. An increasing number of adults older than 65 years are seeking information on the internet[39] with 38% of seniors using the internet; however the majority (75%) do not consistently check the source and date of information found. A study with adult primary care patients in the United States (US) found that adequate health literacy was associated with increased CAM use among white Americans.[20] Von Conrady et al,[40] cluster analysis of a survey of general primary care patients in Australia found that female patients had high levels of CAM use but lower health literacy scores. A study by Shreffler-Grant et al,[41] concluded that without adequate CAM health literacy, older consumers may not understand health care choices that may benefit or harm them. There is also a need for balanced information communicated to the public of the risks and benefits of CAM.

The study findings suggest participants in our study had moderate to good levels of health literacy. Our findings suggest that higher levels of social support, from family and friends was associated with greater use of CAM from OTC. This is not surprising given sources of information of CAM among this study population were from this support network. CAM users' confidence in making decisions was not found to influence whether they used forms of CAM accessed OTC or by a CAM practitioner. The finding that higher health literacy scores were associated with an ability to engage with health care practitioners and use of over the counter CAM or OTC and CAM health practitioners might reflect conversations from the participants social support networks that lead to older Australians to access OTC in particular following productive interactions to access CAM independently. We found no difference in decision self-efficacy and whether participants used over the counter products or accessed CAM from health practitioners. This population participated in an education intervention to improve health literacy and decision making self-efficacy.[24] Unpublished findings found significant improvements in health literacy and decision self-efficacy.

5. Strengths and limitations

Findings from this study may not be generalizable to older Australians. A high proportion of participants were living in retirement villages and there was greater participation of older women who were more educated, however this may be explained by the setting in which

the study was conducted. The data are also self-reported. The discussion/education the participants would receive about CAM may have also been influenced by the place where participants were accessing them: i.e. pharmacies, supermarket chains, health food stores etc. However, these would only be related to those available over the counter and not to other forms of CAM.

6. Conclusion

Use of CAM was not associated with decision self-efficacy and health literacy. With an increasing focus on self-care, and use of CAM, there remains a need to further examine decision making and self-efficacy and use of CAM by older people. Further studies with older populations are needed.

Conflicts of interest

None.

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