Journal of Yoga & Physical Therapy

OPEN ACCESS Freely available online

Research Article

The use of yoga for chronic health conditions: Results from the Australian 45 and Up Study

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ABSTRACT

Background: Unprecedented changes to the structure of the Australian population are predicted for the near future, with adults over the age of 65 years estimated to increase by around 50% in the next 15-20 years. The prevalence of chronic diseases among the older adult population is high. In recent years, yoga is being utilised as a means of promoting physical, psychological and social well-being. However, the extent of yoga utilisation among the middle to older aged women in Australia remains unclear.

Methods: Data were obtained via a survey of 1,925 women aged 45 years and over living in (State of) New South Wales, Australia diagnosed with asthma, depression, diabetes, osteoarthritis and/or osteoporosis, randomly selected from the 45 and Up Study participants.

Results: Consultation with a yoga instructor (3.4%) and self-practiced yoga (4.8%) specifically for chronic illness was relatively low. Positive bivariate associations were found between educational status and women who consulted a yoga instructor (p=0.006) and women who self-practiced yoga (p=0.038) for their condition; a similar association was found between yoga self-practice and marital status (p=0.007). Of the five-chronic illness, only women diagnosed with diabetes were more likely to consult a yoga instructor (OR=3.47) and self-practice yoga (OR=3.32), compared to women with other conditions.

Conclusions: Australian women with asthma, depression, diabetes, osteoarthritis and/or osteoporosis are relatively low-level users of yoga. It is recommended that future research should examine why yoga use is so low compared to other chronic diseases. There is a need for large-scale studies to examine the associations between women with chronic health conditions and yoga use amongst wider health care utilisation.

Keywords: Yoga use; asthma; depression; diabetes; osteoarthritis; osteoporosis; women.

INTRODUCTION

Unprecedented changes to the structure of the Australian population are predicted for the near future and adults over the age of 65 years are likely to increase by around 50% in the next 15-20 years [1,2]. The rapidity and scale of this population aging highlight the need for timely and reliable evidence regarding the key factors impacting on the health and the health care utilisation by older people in Australia. Yoga a mind-body health care approach with long histories of practice in Indian culture [3] have in the recent years gained popularity amongst the individuals with health conditions globally, including Australia. Yoga is a combination of physical postures, breathing exercises, and meditation techniques [4]. Yoga practice may involve instructor facilitated practice and/or can be integrated into daily routines and self-practiced without an instructor. Yoga has been utilised as a means of promoting physical, psychological and spiritual well-being [5]. Studies have shown that in Australia yoga has been an important part of the growing field of health promotion and disease prevention [6-11]

In the recent years, the use of yoga has been increasing among individuals of all age groups and all walks of life [6,7,12-15] The therapeutic benefits of yoga are well documented [16], yet nothing is known about the practice of yoga among Australians above the age of 45 and whether yoga is used as a physical activity, a form of therapy, a spiritual path, or for health promotion and prevention of chronic health conditions. A study from US reported that 48% of the study participants used yoga for health conditions [17]. Another study from Germany reported 12.9% of adults practicing yoga were found to have a chronic health disorder [18]. Yoga use is

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Received date: January 18, 2020; **Accepted date:** May 21, 2020; **Published date:** May 28, 2020

Citation: Sridhar M, Frawley J, Adams J, Sibbritt D, The use of yoga for chronic health conditions: Results from the Australian 45 and Up Study. J Yoga Phys Ther 10: 301. doi: 10.35248/2157-7595.2020.10.301

been reported among individuals diagnosed with health conditions including cancer, musculoskeletal, mental health conditions, asthma, fibromyalgia, arthritis, diabetes [17-20] Health conditions like back pain, neck pain and shoulder pain, severe sprains, anxiety and asthma were associated with greater yoga use and may be the primary health-related motivation for yoga use, while hypertension and chronic obstructive pulmonary diseases were associated with lesser yoga use [9,21]. The aim of this study was to address this knowledge gap, by examining the use of yoga as a complementary health care by Australian women for a chronic illness, specifically asthma, depression, diabetes, osteoarthritis, and osteoporosis.

Methods

Subjects:

The 45 and Up Study is a large-scale Australian cohort study of individuals aged 45 and over, which recruited men and women aged 45 and over from the general population of the state of New South Wales, Australia. The 45 and Up Study was designed to investigate multiple factors affecting the health and well-being of women and men over the age of 45 years. Individuals were randomly sampled from the Medicare Australia enrolment database. This database includes all citizens and permanent residents of Australia, as well as some temporary residents and refugees. Participant recruitment for this study commenced in February 2006; a total of 267,153 participants joined the Study between January 2006 and December 2009 by completing a baseline questionnaire (response rate 18%) and giving signed consent for follow-up and linkage of their information to routine health databases [22,23]. For this sub-study of the 45 and Up Study, questionnaires were sent to 3,200 women who had indicated in the baseline and follow-up surveys that they had one of five chronic illnesses (i.e. 640 women from each of the chronic illness groups: asthma, depression, diabetes, osteoarthritis, or osteoporosis), with 1,925 (60.2%) returning completed questionnaires. Relevant ethical approval was gained from University of Technology Sydney, Australia.

DEMOGRAPHIC CHARACTERISTICS

Questionnaire items on marital status, urban or rural residence, higher educational qualification the participants had completed, and how they are able to manage their available income were utilised to extrapolate the demographic characteristics.

CHRONIC ILLNESS

Women were asked to indicate the amount of time (years) they were diagnosed with the chronic condition. They were also asked to rate out of 10 (where 0=least severe and 10=most severe), the severity of their chronic condition in the previous 12 months and in the previous 4 weeks.

CONSULTATION WITH A YOGA INSTRUCTOR

Women were asked if they had consulted a yoga instructor for their condition in the previous 12 months and questioned about the frequency of consultations. The women were also asked about the self-practice of yoga for their conditions and the frequency of self-practice.

STATISTICAL ANALYSIS

Prevalence estimates for yoga use were calculated with 95% confidence intervals. Pearson's chi-square tests were used to compare categorical variables. One-way analysis of variance was used to compare categorical and continuous variables. For multivariate analyses, two logistic regression models were performed: a logistic regression model with consultation with a yoga instructor as the dependent variable and chronic conditions as the independent variables, as well as the cofounder variables of education, health insurance, and yoga auxiliary insurance cover; and a logistic regression model with yoga self-practice as the dependent variable and chronic conditions as the independent variables, as well as the cofounder variables of marital status, education, and yoga auxiliary insurance cover. All analyses will be conducted using the statistical software package STATA 13.

RESULTS

In total, 1,925 women responded to the survey, and of these women, 19.4% (n=375) completed the asthma questionnaire, 18.7% (n=361) completed the depression questionnaire, 20.3% (n=392) completed the diabetes questionnaire, 20.9% (n=404) completed the osteoarthritis questionnaire and 20.4% (n=393) completed the osteoporosis questionnaire.

The average age of the participants was 68.9 (SD= 0.2) years. The majority (61.0%) of the participants were married or de facto/ living with a partner. There was almost an equal representation of participants from urban (48.2%) and rural (51.7%) locations. A university degree was attained by 29.4%, with 29.9% having completed a trade, apprentice or a diploma qualification, 32.8% had only a school qualification and 7.7% had no formal qualification. The majority (66.8%) of the participants reported that they could manage on their available income with no or little difficulty, 22.3% had some difficulty managing and 10.8% struggled to manage with their available income. The majority of participants reported having private health insurance (68.5%); however, only 2.9% of participants had auxiliary/secondary insurance cover for yoga use.

Only 3.4% (n=66) of women reported consulting a yoga instructor for their condition and 4.8% (n=94) reported self-practicing yoga for their condition. Table 1 reports demographic characteristics of women with chronic conditions using yoga. Positive bivariate associations were found between educational status and women who consulted a yoga instructor (p=0.006) and women who self-practiced yoga (p=0.038) for their condition, where the likelihood of a women using yoga increasing with increasing levels of education. A similar association was found between yoga self-practice and marital status (p=0.007). Married and women in a de facto relationship were more likely to self-practice yoga. Women with private health insurance were more likely to consult a yoga instructor for their health conditions (p=0.001). The associations between having an auxiliary yoga cover and consulting a yoga instructor and self-practiced yoga was very strong (p<0.001); where women with auxiliary yoga cover were more likely to practice yoga.

Bivariate comparison of health conditions and characteristics of the health conditions among women and consulting a yoga instructor are presented in Table 2. There were positive associations between women with diabetes (p=0.009) and osteoporosis (p=0.043) and consulting a yoga instructor. Similarly, bivariate comparison of health conditions and characteristics of the health conditions among women and yoga self-practice are presented in Table 3. Positive associations between women with diabetes and self-practice (p=0.001) were observed. There were positive associations between women with diabetes (p=0.009) and osteoporosis (p=0.043) and consulting a yoga instructor. The bivariate comparison

Table 1: Demographic characteristics of women with chronic conditions using yoga.

Characteristics	Consulted a yoga instructor		p-value	Yoga self-practice		p-value
	Yes (n=66)	No (n=1,859)		Yes (n=94)	No (n=1,831)	
Marital status						
Single	9.2%	7.8%	0.368	16.1%	7.4%	0.007
Married/De facto	67.6%	60.9%		61.1%	61.6%	
Separated/divorced/widowed	23.0%	31.2%		30.9%	30.9%	
Area of residency						
Urban	53.1%	48.0%	0.424	44.0%	48.4%	0.413
Rural	46.8%	51.9%		55.9%	51.5%	
Education						
No formal school	4.5%	7.8%	0.006	4.2%	7.9%	0.038
School only	18.1%	33.3%		22.3%	33.3%	
Trade/apprentice/diploma	30.3%	29.9%		35.1%	29.6%	
University/higher degree	46.9%	28.8%		38.3%	28.9%	
Income						
No or little difficulties	77.2%	66.5%	0.128	70.2%	66.7%	0.598
Some difficulties	18.1%	22.4%		18.0%	22.5%	
Struggles with income	4.5%	11.0%		11.7%	10.7%	
Private health insurance						
Yes	12.5%	32.1%	0.001	26.8%	31.6%	0.331
No	87.5%	67.8%		73.1%	68.3%	
Auxiliary cover						
Yoga covered	86.3%	97.4%	<0.001	87.2%	97.5%	<0.001
Yoga not covered	13.6%	2.5%		12.7%	2.4%	

Table 2: The association between consulting a yoga instructor and chronic health conditions.

Chronic disease		Consulted a yoga instructor		
		Yes (n=66)	No (n=1,859)	p-value
		%	%	
Asthma	**Yes**	84.4	80.3	0.366
	No	15.6	19.7	
Depression	**Yes**	74.3	81.5	0.138
	No	25.7	18.5	
Diabetes	**Yes**	92.5	79.1	0.009
	No	7.5	20.9	
Osteoarthritis	**Yes**	78.7	79.1	0.964
	No	21.3	20.9	
Osteoporosis	**Yes**	69.7	79.9	0.043
	No	30.3	20.1	

shows that women with chronic asthma, diabetes, osteoarthritis and osteoporosis (p<0.001) were more likely to consult a yoga practitioner compared to women with depression.

A comparison of health conditions and characteristics of the health conditions among women are presented in Table 4. The bivariate comparison shows that women with chronic asthma, diabetes, osteoarthritis and osteoporosis (p<0.001) were more likely to consult a yoga practitioner compared to women with depression. Severity in the past 12 months also determines to consult with a yoga instructor. Bivariate comparisons between severity and health conditions show that women with severe asthma, diabetes, and osteoarthritis in the past 12 months showed a significantly positive association between severity of the condition and consulting a yoga instructor compared to women with depression and osteoporosis.

Table 5 shows the results of the multiple logistic regression modelling, identifying the factors associated with yoga instructor consultation. Women were 3.47 (95% CI:1.24, 9.46) times significantly more likely to consult a yoga instructor if they were diagnosed with diabetes (p=0.017) but significantly less likely to consult a yoga instructor if they had osteoporosis (OR=1.04; 95% CI: 0.53, 2.07) (p=0.892), depression (OR=0.95; 95% CI: 0.48, 1.88) (p=0.892), osteoarthritis (OR=1.48; 95% CI: 0.70, 3.13) (p=0.298), and asthma (OR=0.31; 95% CI: 0.21, 0.79) (p=0.082), compared to women with diabetes. Similarly, Table 6 shows the results of multiple

Table 3: The association between yoga self-practice and chronic health conditions.

		Yoga Self-practice		
Chronic disease		Yes (n=94)	No (n=1,831)	p-value
		%	%	
Asthma	Yes	76.6	80.7	0.325
	No	23.4	19.3	
Depression	Yes	75.5	81.5	0.146
	No	24.5	18.5	
Diabetes	Yes	92.5	78.9	<0.001
	No	7.5	21.1	
Osteoarthritis	Yes	82.9	78.8	0.333
	No	17.1	21.2	
Osteoporosis	Yes	72.4	79.9	0.074
	No	27.6	20.1	

Table 4: The association between chronic health conditions and chronic health conditions characteristics.

Years with chronic health condition	mean (SD)	mean (SD)	p-value
Years with asthma	31.0 (20.2)	12.9 (11.5)	<0.001
Years with depression	15.4 (13.0)	16.7 (15.9)	0.153
Years with diabetes	12.6 (10.8)	17.5 (16.3)	<0.001
Years with osteoarthritis	14.2 (12.0)	17.1 (16.2)	<0.001
Years with osteoporosis	9.5 (9.0)	18.3 (16.3)	<0.001
Severity of chronic health condition in the past 12months			
Severity of asthma in the past 12 months	2.7 (1.9)	4.0 (2.5)	<0.001
Severity of depression in the past 12 months	3.8 (2.4)	3.7 (2.4)	0.5
Severity of diabetes in the past 12 months	3.1 (2.2)	3.9 (2.4)	<0.001
Severity of osteoarthritis in the past 12 months	5.1 (2.3)	3.3 (2.3)	<0.001
Severity of osteoporosis in the past 12 months	3.8 (2.5)	3.7 (2.4)	0.498
Severity of chronic health condition in the past 4 weeks			
Severity of asthma in the past 4 weeks	2.7 (2.1)	3.8 (2.5)	<0.001
Severity of depression in the past 4 weeks	3.5 (2.4)	3.6 (2.4)	0.621
Severity of diabetes in the past 4 weeks	3.0 (2.1)	3.7 (2.5)	<0.001
Severity of osteoarthritis in the past 4 weeks	5.0 (2.3)	3.2 (2.3)	<0.001
Severity of osteoporosis in the past 4 weeks	3.6 (2.5)	3.6 (2.4)	0.838

Table 5: Multiple logistic regression model for consultation with a yoga instructor among women with chronic conditions.

Yoga instructor visits	Odds Ratio*	95% C.I.	p-value
Asthma	2.04	0.88, 4.29	0.082
Depression	0.95	0.48, 1.88	0.892
Diabetes	3.47	1.24, 9.46	0.017
Osteoarthritis	1.48	0.70, 3.13	0.298
Osteoporosis	1.04	0.53, 2.07	0.892

* logistic regression model adjusted for education, health insurance, and yoga auxiliary insurance cover.

Table 6: Multiple logistic regression model for self-practice of yoga among women with chronic conditions.

Self-practice of yoga	Odds Ratio*	95% C.I.	p-value
Asthma	1.09	0.59, 2.03	0.766
Depression	1.04	0.57, 1.88	0.890
Diabetes	3.32	1.39, 7.90	0.007
Osteoarthritis	1.54	0.79, 3.00	0.202
Osteoporosis	0.95	0.52, 1.73	0.890

* logistic regression model adjusted for marital status, education, and yoga auxiliary insurance cover.

logistic modelling identifying the factors associated with yoga self-practice. Women were 3.32 (95% CI: 1.39, 7.90) times more likely to self-practice yoga if they were diagnosed with diabetes, compared to women with other health conditions (p=0.007).

DISCUSSION

This study reports the prevalence of yoga use among Australian women over the age of 45 years consulting a yoga instructor or self-practice of yoga for asthma, depression, diabetes, osteoarthritis, and osteoporosis. While many studies on general yoga use have been undertaken [24-26], this is the first study to focus specifically on Australian women aged 45 years and over with chronic health conditions. Previously, it has been reported that 27% of Australian women aged 56 – 61 years used yoga [7], but our study found 3.4% of women consulted a yoga instructor and 4.8% self-practiced yoga specifically for their health conditions. Our study suggests that the use of yoga for chronic conditions is less common compared to the general use of yoga among women in Australia, and thereby differs from studies in other countries such as US [19], UK [27], and Germany [18]. This disparity may be due to the random selected of the participants from the national Medicare database.

Some studies have reported the prevalence of yoga use among individuals diagnosed with health conditions [20,27-30]. A study reported that 48% of study participants used yoga for health conditions [17]. Another study from Germany reported 12.9% of adults practicing yoga were found to have a chronic health disorder [18]. A study from the UK reported 4% of patients used yoga in the past 12 months and diabetic people were less likely to use yoga compared to people without diabetes [31]. However, our study found that diabetic Australian women were more likely to consult a yoga instructor and self-practice yoga.

Other studies have reported yoga use was common among individuals diagnosed with musculoskeletal conditions, mental health conditions, asthma, fibromyalgia, arthritis, diabetes [17-20]. However, we also found that the predictors of yoga use differed between women consulting yoga instructor and women self-practicing yoga. Although our bivariate analysis shows women with long-term asthma, diabetes, osteoarthritis, and osteoporosis were more likely to consult a yoga instructor compared to women with depression. However, our multiple regression models found women with diabetes were more like to consult a yoga instructor compared to women with asthma, depression, osteoarthritis, and osteoporosis. On the other hand, women with diabetes were more likely to self-practice yoga compared to women with other conditions. Suggesting women with diabetes were using yoga for improving their quality of life.

Birdee, Legedza [19] reported individuals with mental health conditions, severe sprains, asthma, and musculoskeletal conditions used yoga and it was perceived to be helpful in the treatment of musculoskeletal and mental health conditions. Sibbritt, Adams [7] reported Australian women who used yoga had a higher physical functioning and greater emotional, mental and social health compared to those who do not use yoga. Ross, Friedmann [32] reported that 60% of yoga users have at least one chronic or serious health condition, yet most yoga users believed that their general health was very good or excellent. Further, yoga users reported that practicing yoga has been life-changing and has significantly impacted their life. Large sample sized studies from Australia and United States [9,32] reported by practicing yoga the yoga users' health conditions improved. Yoga users perceived that yoga was equal or superior to exercise and more they practice yoga the more wellbeing they achieved. Another German study reported on yoga using internal medicine patients, the study found yoga users reported better general health status and a higher physical component summary for health-related quality of life [33]. Yoga users scored higher on all dimensions of quality of life in the SF-36 (measure), including mental quality of life [34]. Suggesting, that individuals with chronic health conditions should utilise yoga for addressing their health conditions particularly related to musculoskeletal and respiratory conditions.

Satin, Linden [35] in relation to the psychological parameters found that yoga users scored significantly lower on depression and perceived stress. Bertisch, et al. [36] reported that individuals with physical symptoms like face and neck pain and psychological conditions like anxiety/depression used yoga. Another study found long-term yoga users had a lower heart rate when exposed to a stressor, and had higher levels of epinephrine and lower levels of serum Interleukin-6 indicating increased energy levels and vitality and reduced inflammation and cellular aging among yoga users [37]. Continued use of yoga has been associated with higher levels of psychological wellness, subjective vitality, the experience of a transcendence of the ordinary and positive psychological attitudes [38] Another similar study on yoga users reported that prolonged use of yoga is associated with improved general health, mental health, sleep, energy, diet, weight, relationships, happiness and reduction in alcohol consumption[32]. Compared to individuals with no current or prior yoga use, yoga users reported using yoga bone density, depression, and pain relief [39]. Marques, Ferreira [40] found yoga users reported psychological factors and, to a lesser extent cognitive factors, were positively associated with yoga use. Suggesting Australian women suffering from depression should consult a yoga instructor for improving their health and quality of life. Beyond these findings, there is a need to undertake further research to identify the reasons why people with chronic health conditions use yoga among a multitude of healthcare options. Such investigation could provide important insights for healthcare providers and policymakers.

Our analysis shows, women with higher university qualification were more likely to consult a yoga instructor and married and women in a de facto relationship were more likely to self-practice yoga. On the other hand, income and area of residency of Australian women with chronic health conditions do not influence consulting a yoga instructor or self-practice yoga. These findings contrast to those from previous studies where being single, higher income, living in urban areas and higher education were found to be the characteristics of yoga users in Australia [7] The reasons for this contrast may be due to this study examined women with chronic health conditions. A similar study from England found that the majority of yoga users were more likely to be female, non-manual social class, have a degree, obese, report themselves as healthy and have inactive occupations [15]. However, the findings are in align with other previous studies, a US-based study reported that the average income of yoga users in the US was US$ 40,000, the study also found that the education status of yoga users was having a college graduation and higher education and also reported that 45.8% of the study population were married [41]. A similar study from the US also found similar findings reporting that yoga users were college graduates or higher, earning over the US $50,000 a year and married [27]. Findings on education, income, and marital status were consistent across the US and Europe but opposite to Australian women with chronic health conditions.

Our study found that yoga use was positively associated with insurance cover among Australian women with chronic health conditions. Women with private health insurance were more likely to consult a yoga instructor for their health conditions and women with auxiliary yoga cover were more likely to consult a yoga instructor and self-practice yoga., These findings are in agreement with previous US study which reported that 67% of yoga users have private health insurance and 12% were uninsured [27]. However, another study reported that yoga use was unrelated to insurance status [19]. While these findings are interesting, further research is needed to explore the details and reasons for the differences in yoga use among those with chronic health conditions. Further, large-scale population-based studies are needed to examining associations between women's use of yoga for chronic health conditions and health care utilisation.

The interpretation of our findings is limited by the fact that women consulting a yoga instructor or self-practice of yoga for their health conditions is self-reported by the participants, and the results may be potentially affected by recall bias. Further, several potential confounders were included in our analyses; however, other possible confounders were not measured, for example, ethnicity and severity of the condition. The interpretation of our findings is also limited by the fact that our study examined yoga use over a 12-month period—a relatively brief time span in which to identify patterns and changes in yoga use. Another limitation is that the study sample was restricted to only women aged 45 years and over and, as such, may not be generalisable to all adult Australians. All these limitations arise from the fact that our study was derived from a larger project that was not primarily designed to determine yoga use. Despite this, the 45 and Up Study 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 women with chronic health conditions using yoga amidst other healthcare options.

CONCLUSION

Our study identifies that Australian women with chronic health conditions like diabetes and depression were more likely to consult a yoga instructor, women with diabetes and osteoporosis were more likely to self-practice yoga and women with auxiliary yoga cover were consulting yoga instructors and self-practicing yoga. There is a need for further research to examine the associations between women with chronic health conditions and yoga use. It is important that the future research investigates the yoga use among the women with chronic health conditions in relation to the wider health care utilisation.

ACKNOWLEDGMENT

This research was completed using data collected through the 45 and Up Study (www.saxinstitute.org.au). The 45 and Up Study is managed by the Sax Institute in collaboration with major partner Cancer Council NSW; and partners: The National Heart Foundation of Australia (NSW Division); NSW Ministry of Health; NSW Government Family & Community Services – Ageing, Carers and the Disability Council NSW; and the Australian Red Cross Blood Service. We thank the many thousands of people participating in the 45 and Up Study.

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