Use of massage therapy by mid-aged and older Australian women

Suzy Ladanyi1*, Jon Adams2 and David Sibbritt3

Abstract

Background: Massage is a widely accepted and popular form of complementary medicine (CM) among Australian women. While there is some research that reports on massage use in younger women, there is minimal research exploring massage use in the treatment of chronic illness in older women. This study provides an estimate of the prevalence of massage use, as well as identifying the characteristics significantly associated with consultation with a massage therapist, for mid-age and older Australian women.

Methods: A cross-sectional sub-study was conducted on a sample of women drawn from the 45 and Up Study; a large cohort study of adults aged 45 years and over. Data from 1795 women were included in the analyses and massage use was compared against measures of demographics, health status and health care utilisation.

Results: A total of 174 (7.7%) women consulted with a massage therapist in the previous 12 months. Women were more likely to consult a massage therapist if they have tertiary level education (O.R. = 1.67; 95% C.I.: 1.04, 2.65; p = 0.031), private health insurance (O.R. = 6.37; 95% C.I.: 4.41, 9.19; p < 0.001) and/or osteoarthritis (O.R. = 1.72; 95% C.I.: 1.19, 2.48; p = 0.004). They were also more likely to consult a massage therapist if they have a poorer health-related quality of life (HRQoL) (O.R. = 1.14; 95% C.I.: 1.04, 1.27; p = 0.007).

Conclusion: Older, tertiary-level educated Australian women with private health insurance were more likely to use massage therapy, as were women with osteoarthritis specifically. Women with lower HRQoL were found to be more likely to use massage therapy in the treatment of their chronic illness. This research provides insight into the determinants of massage use among ageing women and is useful for governments in consideration of accessibility to holistic healthcare when developing public policy for healthcare in Australia.

Keywords: Massage therapy, Massage therapist, Complementary and alternative medicine, Women
older women specifically. In Australia, while some studies have reported on prevalence and determinants of massage use specifically [9, 13] as well as massage and associated HRQoL [19], more research is needed to better understand the determinants of use among mid-aged and older Australian women.

Massage therapy has the potential to benefit mental health and general well-being as it has been reported to alleviate stress and fatigue as well as promote sleep through relaxation and improving blood circulation, blood pressure [20, 21] and support tissue recovery and aid in the prevention of injury after exercise [22]. Additional to the mental health and general well-being benefits of massage therapy, it has also been found to be effective in the treatment of musculoskeletal pain, arthritic and general back pain, neck pain and hip pain [18, 21].

Massage therapy is becoming increasingly recognised for its role as a stand-alone treatment alongside the conventional treatment of disease and medical conditions as it has been reported to be a safe and effective intervention in alleviating blood pressure in the treatment of patients with hypertension [23, 24]; as well as reducing fatigue and promoting sleep during patient recovery from cardiopulmonary bypass graft surgery [25]. It has also been reported that general practitioners (GPs) more commonly refer patients to massage therapists, partly due to their believing in the efficacy of massage therapy [26, 27]. Despite these encouraging findings, women are still more likely to use conventional treatment only, the majority of the time, and less likely to integrate the use of massage therapy for medical conditions [26, 28, 29].

Previous research focused on young and mid-aged Australian women who utilise massage therapy, shows they are more likely to be married, to have a tertiary education, manage well on their income, and have private health insurance, than those not using massage [13]. This same research shows younger women are less likely to use massage if they report depression, anxiety, respiratory conditions and diabetes, and also if they smoke [13]. While the findings in this study are consistent with other research findings [5, 9, 30] and provided much needed information on massage use among young and mid-aged women; the nature of the survey questions utilised, meant that it was only possible to determine that the women had used massage, the questions did not however, indicate any specific condition or reason for such use.

**Methods**

The 45 & Up Study [approved by the University of New South Wales Human Research Ethics Committee (HREC)] is the largest cohort study undertaken in Australia and the Southern Hemisphere; with the aim being to provide insight into the health-related behaviours and needs of mid-age to older Australians. Conducted by the Sax Institute, prospective participants were randomly sampled from the Department of Human Services (then, Medicare Australia) enrolment database, resulting in population coverage of one in ten [31]. A total of 267,153 participants were recruited for baseline and follow-up questionnaires [31] with the baseline questionnaire administered between January 2006 and December 2009.

**Sample**

The findings reported here are from a sub-study of the 45 and Up Study undertaken between April and October of 2017. A project-specific questionnaire, developed to collect information about the health service utilisation of a sample of mid-age and older women drawn from the 45 and Up Study database was used. Participants in this study referred to as ‘women’, were assigned the sex of female at birth and identified as women. A total of 1,925 randomly sampled women aged between 53 and 95 (mean = 69) years returned a completed questionnaire, providing information of their demographics, health status and healthcare utilisation. Ethics approval for this sub-study dataset was gained from the HREC at the University of Technology Sydney, Australia.

**Demographic characteristics**

Participants were asked about demographic information including age, area of residence, marital status, highest level of education, ability to manage on available income, and whether or not they had private health insurance. Area of residence was assigned according to the Accessibility/Remoteness Index of Australia (ARIA +) [32, 33]. Women were also asked about their level of activity relating to exercise as well as their consumption of alcohol and cigarettes/tobacco.

**Health status**

Participants were asked to self-rate their HRQoL using the EQ-5D-3L, an instrument comprising five health dimensions: mobility, self-care, activities, pain/discomfort, and anxiety/depression. The EQ-5D is a widely used and standardised index validated in Australian research [34, 35]. Health-related hardiness and body mass index (BMI) were also included in the questionnaire. Hardiness relates directly to perceived health and how this applies to health-related behaviours and in turn, how individuals utilise healthcare services [36–38]. Finally, participants were asked to indicate if they were diagnosed or treated by a doctor in the past 12 months for 12 common age-appropriate symptoms, including: depression; anxiety/nervous disorder; dementia/Alzheimer’s disease; asthma; diabetes; osteoarthritis; osteoporosis; Parkinson’s disease;
heart disease (including heart attack or angina); stroke; hypertension; and cancer (excluding skin cancer).

Health service utilisation
Participants were asked to indicate the frequency with which they consulted healthcare practitioners in the past 12 months. A list of 10 conventional practitioner types were provided: general practitioner (GP); medical specialist; hospital doctor; nurse; pharmacist/chemist; counsellor; psychologist; dietician; physiotherapist; and occupational therapist. Meanwhile, 10 CM practitioner types were provided: massage therapist; chiropractor; osteopath; acupuncturist; naturopath/herbalist; homeopath; meditation instructor; yoga instructor; nutritionist; and Chinese medicine practitioner. Participants were also asked about their use of CM products and practices such as aromatherapy oils, herbal medicine, vitamins and minerals, meditation (without instructor), and yoga (without instructor).

Statistical analysis
Bivariate analysis was used to examine the association between massage use and all of the demographic data, health status and health care utilisation measures. Specifically, chi-square tests were used to examine the association between massage use and categorical measures. Student’s t-test were used to examine the association between massage use and continuous measures. Multiple logistic regression model building was used to identify statistically significant characteristics associated with massage therapist consultations. Specifically, all variables with a bivariate \( p \)-value < 0.25 were entered into a multiple logistic regression model, then a backward stepwise approach was employed, using the log-likelihood, to determine the most parsimonious model predicting massage use. All statistical analysis was conducted using STATA 16.1.

Results
A total of 174 (7.7%) women consulted with a massage therapist in the previous 12 months. Table 1 presents the association between consultation with a massage therapist and demographic characteristics. Women who have tertiary level education \( (p < 0.001) \) and/or private health insurance \( (p < 0.001) \) were more likely to consult a massage therapist in comparison to women without a tertiary education and/or private health insurance.

The association between use of a massage therapist and health status and is shown in Table 2. This data indicates that women who experience depression, anxiety/nervous disorder, dementia/Alzheimer’s disease, asthma, diabetes, osteoarthritis, osteoporosis, Parkinson’s disease, heart disease (including heart attack/angina), stroke, hypertension, cancer (Excluding skin cancer) are less likely to consult with a massage therapist, compared to women who do not experience these conditions (all \( p > 0.001 \)).

Table 3 presents the association between consultation with a massage therapist and health service utilisation as follows:

| Area of Residence | Consulted with a massage therapist |
|-------------------|-----------------------------------|
|                   | Yes (n) (%) | No (n) (%) | \( p \)-value |
| Major Cities      | 65 (45)     | 842 (48)   |              |
| Inner Regional    | 64 (44)     | 682 (39)   |              |
| Outer Regional / Remote | 15 (10) | 213 (12)   | 0.454        |

| Marital Status    | Consulted with a massage therapist |
|-------------------|-----------------------------------|
|                   | Yes (n) (%) | No (n) (%) | \( p \)-value |
| Single            | 9 (6)       | 141 (8)    |              |
| Married Defacto   | 95 (64)     | 1072 (61)  |              |
| Widowed/Divorced/Separated | 44 (30) | 548 (31)   | 0.614        |

| Education         | Consulted with a massage therapist |
|-------------------|-----------------------------------|
|                   | Yes (n) (%) | No (n) (%) | \( p \)-value |
| No Formal Education or School | 35 (24) | 739 (42) |              |
| Trade / Apprentice / Diploma | 57 (39) | 514 (29) |              |
| University / Higher Degree | 56 (38) | 505 (29) | <0.001        |

| Manages on Income | Consulted with a massage therapist |
|-------------------|-----------------------------------|
|                   | Yes (n) (%) | No (n) (%) | \( p \)-value |
| Little or no Difficulty | 90 (60) | 1190 (67) |              |
| Some Difficulty | 37 (25)     | 390 (22)   |              |
| Struggles with Income | 22 (15) | 185 (10) | 0.149        |

| Private Health Insurance | Consulted with a massage therapist |
|--------------------------|-----------------------------------|
|                           | Yes (n) (%) | No (n) (%) | \( p \)-value |
| Yes                      | 92 (62)     | 356 (20)   |              |
| No                       | 57 (38)     | 1420 (80)  | <0.001       |

| Exercise                | Consulted with a massage therapist |
|-------------------------|-----------------------------------|
| Inactive / Sedentary    | 36 (24)     | 540 (32)   |              |
| Moderately Active       | 28 (19)     | 268 (16)   |              |
| Highly Active           | 83 (56)     | 887 (52)   | 0.16         |

| Cigarette/Tobacco Use  | Consulted with a massage therapist |
|------------------------|-----------------------------------|
| Yes                    | 7 (5)                              | 95 (5) |              |
| No                     | 141 (95)                           | 1634 (95) | 0.694 |

| Alcohol                | Consulted with a massage therapist |
|------------------------|-----------------------------------|
| Yes                    | 9 (6)                              | 147 (8) |              |
| No                     | 140 (93)                           | 1629 (92) | 0.337 |

| Sleep                  | Consulted with a massage therapist |
|------------------------|-----------------------------------|
| Optimal                | 76 (52)                            | 940 (54) |              |
| Not Optimal            | 71 (48)                            | 800 (46) | 0.588        |

| EQSD_THERMO            | Consulted with a massage therapist |
|------------------------|-----------------------------------|
| Mean (SD)              | 67.6 (17.8)                       | 71.3 (18.8) | 0.0180 |
| Health Hardiness       | 30.2 (5.6)                        | 30.2 (6.3) | 0.9946 |
| BMI                    | 29.3 (7.3)                        | 28.9 (7.3) | 0.519        |
utilisation within the previous 12 months. These results indicate that women were more likely to consult with a massage therapist if they consulted a GP, medical specialist, pharmacist/chemist, psychologist and/or physiotherapist, compared to women who did not consult these practitioners (all $p < 0.001$).

The associations between consultation with a massage therapist and consultations with another CM practitioner, as well as use of CM products and practices, can be seen in Table 4. This data shows that women who consult with a massage therapist are more likely to consult with a chiropractor, osteopath, acupuncturist, naturopath/herbalist, yoga instructor, nutritionist and/or Chinese medicine practitioner (all $p < 0.001$), compared to

| Table 2 The association between health conditions and consultation with a massage therapist |
|-----------------------------------------------|------------------|------------------|------------------|
| Condition                                    | Consulted a Massage Therapist | Consulted a Massage Therapist | p-value          |
|                                              | Yes              | No               |                  |
|                                              | n (%)            | n (%)            |                  |
| Depression                                   |                  |                  |                  |
| Yes                                          | 41 (28)          | 378 (21)         | 0.077            |
| No                                           | 108 (72)         | 1398 (79)        |                  |
| Anxiety/Nervous Disorder                     |                  |                  |                  |
| Yes                                          | 37 (25)          | 327 (18)         | 0.055            |
| No                                           | 112 (75)         | 1449 (82)        |                  |
| Dementia / Alzheimer's Disease               |                  |                  |                  |
| Yes                                          | 0 (0)            | 7 (1)            | 0.443            |
| No                                           | 149 (100)        | 1796 (99)        |                  |
| Asthma                                       |                  |                  |                  |
| Yes                                          | 28 (19)          | 413 (23)         | 0.213            |
| No                                           | 121 (81)         | 1363 (77)        |                  |
| Diabetes                                     |                  |                  |                  |
| Yes                                          | 25 (17)          | 426 (24)         | 0.046            |
| No                                           | 124 (83)         | 1350 (76)        |                  |
| Osteoarthritis                               |                  |                  |                  |
| Yes                                          | 71 (48)          | 662 (37)         | 0.12             |
| No                                           | 78 (52)          | 1114 (63)        |                  |
| Osteoporosis                                 |                  |                  |                  |
| Yes                                          | 40 (27)          | 414 (23)         | 0.329            |
| No                                           | 109 (73)         | 1362 (77)        |                  |
| Parkinsons Disease                           |                  |                  |                  |
| Yes                                          | 2 (1)            | 14 (1)           | 0.474            |
| No                                           | 147 (99)         | 1762 (99)        |                  |
| Heart Disease (Incl heart attack/angina)     |                  |                  |                  |
| Yes                                          | 16 (11)          | 204 (11)         | 0.783            |
| No                                           | 133 (89)         | 1572 (89)        |                  |
| Stroke                                       |                  |                  |                  |
| Yes                                          | 1 (1)            | 24 (1)           | 0.480            |
| No                                           | 148 (99)         | 1752 (99)        |                  |
| Hypertension                                 |                  |                  |                  |
| Yes                                          | 55 (37)          | 611 (34)         | 0.536            |
| No                                           | 94 (63)          | 1165 (66)        |                  |
| Cancer (excluding skin cancer)               |                  |                  |                  |
| Yes                                          | 5 (3)            | 97 (5)           | 0.270            |
| No                                           | 144 (97)         | 1679 (95)        |                  |
| Other                                        |                  |                  |                  |
| Yes                                          | 47 (32)          | 518 (29)         | 0.541            |
| No                                           | 102 (68)         | 1258 (71)        |                  |

| Table 3 The association between health service utilisation measures and consultation with a massage therapist |
|-----------------------------------------------|------------------|------------------|------------------|
| Practitioner Consulted                        | Consulted a Massage Therapist | Consulted a Massage Therapist | p-value          |
|                                              | Yes              | No               |                  |
|                                              | n (%)            | n (%)            |                  |
| GP                                           |                  |                  |                  |
| 0 Visits                                     | 26 (18)          | 586 (33)         |                  |
| 1–2 Visits                                   | 65 (44)          | 694 (39)         |                  |
| 3–6 Visits                                   | 37 (25)          | 393 (22)         |                  |
| 7 or more visits                             | 21 (14)          | 103 (6)          | <0.001           |
| Medical Specialist                           |                  |                  |                  |
| 0 Visits                                     | 95 (64)          | 1461 (82)        |                  |
| 1–2 Visits                                   | 39 (26)          | 216 (12)         |                  |
| 3–6 Visits                                   | 13 (9)           | 75 (4)           | <0.001           |
| 7 or more visits                             | 2 (1)            | 24 (1)           |                  |
| Hospital Doctor                              |                  |                  |                  |
| Yes                                          | 13 (9)           | 95 (5)           | 0.085            |
| No                                           | 136 (91)         | 1681 (95)        |                  |
| Nurse                                        |                  |                  |                  |
| Yes                                          | 6 (4)            | 147 (8)          |                  |
| No                                           | 143 (96)         | 1629 (92)        | 0.055            |
| Pharmacist/Chemist                           |                  |                  |                  |
| Yes                                          | 42 (28)          | 252 (14)         |                  |
| No                                           | 107 (72)         | 1524 (86)        | <0.001           |
| Counsellor                                   |                  |                  |                  |
| Yes                                          | 10 (7)           | 59 (3)           | 0.033            |
| No                                           | 139 (93)         | 1717 (97)        |                  |
| Psychologist                                 |                  |                  |                  |
| Yes                                          | 16 (11)          | 75 (4)           |                  |
| No                                           | 133 (89)         | 1701 (96)        | <0.001           |
| Dietician                                    |                  |                  |                  |
| Yes                                          | 18 (12)          | 107 (6)          | 0.004            |
| No                                           | 131 (88)         | 1669 (94)        |                  |
| Physiotherapist                              |                  |                  |                  |
| Yes                                          | 50 (34)          | 162 (9)          |                  |
| No                                           | 99 (66)          | 1614 (91)        | <0.001           |
| Occupational therapist                       |                  |                  |                  |
| Yes                                          | 7 (5)            | 38 (2)           | 0.047            |
| No                                           | 142 (95)         | 1738 (98)        |                  |
women who do not consult these practitioners. Also shown in Table 4, women who consult a massage therapist were also more likely to use aromatherapy oils; herbal medicine; homeopathic remedies; meditation; yoga (without instructor) and multivitamin (all \(p < 0.001\)), compared to women who do not use these products and practices.

Table 5 presents the output from the logistic regression model building undertaken to determine the most parsimonious model which identifies the most important statistically significant predictors of consultation with a massage therapist. In comparison to participants who had no formal school education or school only education, those who had a trade/apprenticeship or diploma education were 1.83 (95% CI: 1.16, 2.88) times more likely to consult with a massage therapist, while those who had attained a university degree were 1.67 (95% CI: 1.04, 2.65) times more likely to consult with a massage therapist. Participants who had private health insurance were 6.37 (95% CI: 4.41, 9.19) times more likely to consult with a massage therapist, compared to those who did not have private health insurance that specifically included massage therapy rebate. Those participants who had been diagnosed or treated for osteoarthritis in the previous 12 months were 1.72 (95% CI: 1.19, 2.48) times more likely to consult with a massage therapist, compared to those who had not been diagnosed or treated for osteoarthritis in the previous 12 months. In terms of quality of life, as measured by the EQ-5D instrument, for every 10-point decrease in the EQ-5D score (i.e. a decline in quality of life), participants were 1.14 (95% CI: 1.04, 1.27) times more likely to consult with a massage therapist.

**Discussion**

This study reports on findings from a representative sample of mid-aged and older Australian women, focusing on the association between massage therapist consultation and demographic characteristics, health status, health service utilisation and CM utilisation. Four key findings emerged from the data. Findings identified that those with higher levels of education were more likely to consult a massage therapist; those with private health insurance which included a rebate for massage therapy were more likely to consult a massage therapist; out of all the diagnosis/conditions that we considered, only osteoarthritis was a significant predictor of massage use; and finally, the poorer the quality of life in mid-aged and older women, the more likely they were to consult a massage therapist.

This study found that among a cohort of mid-aged and older Australian women, 7.7% consulted a massage therapist in the previous 12 months. This result is in contrast with other studies that reported higher rates of massage

| Practitioner Consulted       | Consulted a Massage Therapist | n (%) | n (%) | p-value |
|------------------------------|--------------------------------|-------|-------|---------|
| Chiropractor                 |                                |       |       |         |
| Yes                          | 28 (19)                        | 75 (4) |       | <0.001  |
| No                           | 121 (81)                       | 1701 (96) |       |         |
| Osteopath                    |                                |       |       |         |
| Yes                          | 18 (12)                        | 31 (2) |       | <0.001  |
| No                           | 131 (88)                       | 1745 (98) |       |         |
| Acupuncture                  |                                |       |       |         |
| Yes                          | 30 (20)                        | 44 (2) |       | <0.001  |
| No                           | 119 (80)                       | 1732 (98) |       |         |
| Naturopath/Herbalist         |                                |       |       |         |
| Yes                          | 16 (11)                        | 32 (2) |       | <0.001  |
| No                           | 133 (89)                       | 1744 (98) |       |         |
| Homeopath                    |                                |       |       |         |
| Yes                          | 1 (1)                          | 12 (1) |       | 0.995   |
| No                           | 148 (99)                       | 1764 (99) |       |         |
| Meditation Instructor        |                                |       |       |         |
| Yes                          | 5 (3)                          | 18 (1) |       | 0.011   |
| No                           | 144 (97)                       | 1758 (99) |       |         |
| Yoga Instructor              |                                |       |       |         |
| Yes                          | 24 (16)                        | 42 (2) |       | <0.001  |
| No                           | 125 (84)                       | 1734 (98) |       |         |
| Nutritionist                 |                                |       |       |         |
| Yes                          | 8 (5)                          | 20 (1) |       | <0.001  |
| No                           | 141 (95)                       | 1756 (99) |       |         |
| Chinese Medicine             |                                |       |       |         |
| Yes                          | 6 (4)                          | 10 (1) |       | <0.001  |
| No                           | 143 (96)                       | 1766 (99) |       |         |
| Products or practices used   |                                |       |       |         |
| Aromatherapy Oils            |                                |       |       |         |
| Yes                          | 30 (20)                        | 66 (4) |       | <0.001  |
| No                           | 119 (80)                       | 1710 (96) |       |         |
| Herbal Medicine              |                                |       |       |         |
| Yes                          | 31 (21)                        | 67 (4) |       | <0.001  |
| No                           | 118 (79)                       | 1709 (96) |       |         |
| Homeopathic Remedies         |                                |       |       |         |
| Yes                          | 11 (7)                         | 16 (1) |       | <0.001  |
| No                           | 138 (93)                       | 1760 (99) |       |         |
| Meditation (without instructor) |                            |       |       |         |
| Yes                          | 35 (23)                        | 158 (9) |       | <0.001  |
| No                           | 114 (76)                       | 1618 (91) |       |         |
| Yoga (without instructor)    |                                |       |       |         |
| Yes                          | 17 (11)                        | 77 (4) |       | <0.001  |
| No                           | 132 (89)                       | 1699 (96) |       |         |
| Multivitamin                 |                                |       |       |         |
| Yes                          | 63 (42)                        | 316 (18) |       | <0.001  |
| No                           | 86 (58)                        | 1460 (82) |       |         |
use in Australian women. A previous study reporting on prevalence of massage use in young and mid-aged women found that 42% of young Australian women and 25% of mid-aged women consulted a massage therapist [13]. Another study reporting on the use of CM among 1800 Australian women aged 56-61 years, 51% consulted a massage therapist within the previous 12 months [19]. The contrast in findings here may be due to previous studies reporting on various set age ranges up to 61 years, where findings reported from this study included women 45 years and older. Massage therapy use however, was highest among those who used other forms of CM. This is consistent with other research data that indicates that users of one form of CM are likely to use multiple forms of CM [6].

This study also reported that women with a higher level of education are more likely to consult a massage therapist. These findings are consistent with reports from other Australian studies reporting on women’s use of massage therapy [39–44], as well as studies from the US [1, 45, 46], Canada [47], UK [48] and Sweden [49]. As reported here, women with private health insurance were more likely to consult a massage therapist, with this finding being supported by other research conducted in Australia [10, 42, 50]. The potential implication of this is that women who have better access to health care through private health insurance, including more choice and financial incentives through rebates, find it easier to access the services of massage therapy in the treatment of their chronic illness. Therefore, measures to improve accessibility for CM services such as massage in ageing populations could result in more holistic approaches to health care in the future.

Osteoarthritis is a chronic disease of the joints that is degenerative with age. Conventional treatment options for people with osteoarthritis are limited to medications which are often high in toxicity and/or surgical intervention [51]. Often, despite treatment with conventional methods, those with osteoarthritis still live with debilitating pain and functional limitations that affect quality of life and activities of daily living. It is therefore not surprising that older adults with functional limitations [52], including those with musculoskeletal conditions and back/joint pain [13, 53, 54], are frequent users of massage therapy. Further, with the aging population, some of these consults may be due to underlying osteoarthritic pain.

Findings in this study indicate that osteoarthritis is a significant predictor of massage use in women 45 years and older; and women with osteoarthritis specifically, or who experience a decrease in their HRQoL more generally, were more likely to use massage therapy in the treatment of their chronic illness. Further, preliminary studies both qualitative and quantitative indicate massage therapy has been shown to be an effective and beneficial short-term therapy for people with osteoarthritis [51, 55, 56].

Although the efficacy of massage therapy in the treatment of osteoarthritis has not been proven definitively, there is some evidence to suggest that 60 min of massage may improve pain and functionality in these individuals [51]. Recipients reported feeling empowered and relaxed with improved quality of life when receiving massage for osteoarthritis [55]. Given there is limited research investigating the use of massage therapy in the treatment and care of people with osteoarthritis, this research indicating osteoarthritis is a significant predictor of massage use, together with reported positive outcomes in the benefits and use of massage therapy in the treatment and care of people with osteoarthritis [51, 56] provides reasonable grounds for further investigation of these correlations.

The findings reported here indicate that women increase their use of massage therapy as their quality of life decreases. This finding is consistent with other studies reporting that women with significantly poorer physical and emotional health and poorer quality of life were more likely to seek massage therapy for their back pain.

---

### Table 5: Logistic regression model identifying the characteristics significantly associated with consultation with a massage therapist

| Characteristics          | Odds Ratio* | 95% C.I     | p-value |
|--------------------------|-------------|-------------|---------|
| Education                |             |             |         |
| No formal/School only    | 1           |             |         |
| Trade/Apprentice/Diploma | 1.83        | 1.16, 2.88  | 0.01    |
| University/Higher degree | 1.67        | 1.04, 2.65  | 0.031   |
| Private Health Insurance |             |             |         |
| No                       | 1           |             |         |
| Yes                      | 6.37        | 4.41, 9.19  | <0.001  |
| Osteoarthritis           |             |             |         |
| No                       | 1           |             |         |
| Yes                      | 1.72        | 1.19, 2.48  | 0.004   |
| EQ-5D                    |             |             |         |
| 10-point decrease        | 1.14        | 1.04, 1.27  | 0.007   |

* Adjusted odds ratios
and joint pain [19, 54]. A qualitative study reported participants experienced an improved quality of life associated with receiving massage therapy [55]. These findings are consistent with other research that incorporated quality of life measures while investigating women’s use of CM over time; women experiencing more illness were found to be more likely to use massage therapy and other forms of CM, than those experiencing no change or better health [50]. Finally, and perhaps in the promotion of a more holistic approach to overall well-being and quality of life during chronic disease and periods of poor quality of life, women may be more open to the idea that the benefits of massage therapy extend beyond the visceral. Massage therapy in many cases may be providing more than physical relief through mental health benefits during chronic illness [57–59].

While this research draws upon a robust and internationally recognised study sample, findings from this study should be interpreted with caution. The cross-sectional study design limits the ability to determine causality between variables. Also, participants in the 45 and Up Study cohort are by definition, restricted to a range specified by age. Therefore, when interpreting results, one must be mindful that the sample is representative of women aged 45 years and older and should not be generalised to women from younger age groups, or studies including both men and women, or only men. Another important point to consider is the possibility of selection bias, as people who agree to give up their time to complete surveys may view things differently to the remaining population. Finally, the questionnaires were conducted via self-report, and this has potential to introduce recall bias.

Conclusion
The findings from this study suggest a considerable proportion of mid-aged and older women in Australia are consulting with a massage therapist and it is poorer quality of life and/or osteoarthritis that appears in part to be driving such massage therapy use. Women with a higher education who are able to access massage therapy via private health insurance, are more likely to consult with a massage therapist. Health care providers may use these findings in consideration of holistic care plans and well-rounded support for aging women. Finally, future research should investigate and consolidate evidence regarding massage therapy in pursuit of improved health outcomes related to massage use for mid-aged and older women in our society.

Abbreviations
CM: Complementary medicine; HRQoL: Health-related quality of life; US: United States, UK: United Kingdom; HREC: Human Research Ethics Committee; ARIA+: Accessibility/Remoteness Index of Australia; EQ-SD: EuroQol Group—5 Dimension; BMI: Body mass index; GP: General practitioner.
6. Adams J, Sibbritt D, Broom A, Loxton D, Pirotta M, Humphreys J, et al. A comparison of complementary and alternative medicine users and use across geographical areas: a national survey of 1,427 women. BMC Alter Med. 2011;11:85.
7. Adams J, Steel A, Broom A, Frawley J. Women's health and complementary and integrative medicine. London: Routledge; 2019.
8. Cottingham P, Adams J, Vempati R, Dunn J, Sibbritt D. The characteristics, experiences and perceptions of registered massage therapists in New Zealand: results from a national survey of practitioners. Int J Ther Massage Bodywork. 2018;11(2):11–24.
9. Sundberg T, Corner H, Sibbritt D, Adams J, Lauche R. Prevalence, patterns, and predictors of massage practitioner utilization: Results of a US nationally representative survey. Musculoskeletal Science & Practice. 2017;32:31–7.
10. Frawley J, Adams J, Sibbritt D, Steel A, Broom A, Gallois C. Prevalence and determinants of complementary and alternative medicine use during pregnancy: Results from a nationally representative sample of Australian pregnant women. Aust N Z J Obstet Gynaecol. 2013;53(4):347–52.
11. Peng W, Adams J, Hickman L, Sibbritt DW. Association between consultations with complementary/alternative medicine practitioners and menopause-related symptoms: a cross-sectional study. Climacteric. 2015;18(4):551–8.
12. Sibbritt D, Ladanyi S, Adams J. Healthcare practitioner utilisation for back pain, neck pain and/or pelvic pain during pregnancy: an analysis of 1835 pregnant women in Australia. Int J Clin Pract. 2016;70(10):825–31.
13. Ladanyi S, Adams J, Sibbritt D. Massage therapy utilisation by Australian women: prevalence and determinants. J Bodyw Mov Ther. 2020;24(3):29–37.
14. Feng L, Charn PC, H KE, P NT. Use of complementary and alternative medicines and mental disorders in community-living Asian older adults. Arch Gerontol Geriatr. 2010;50(3):243–9.
15. Aljawi MI, Khaja AT, Aloitaib AD, Alharbi KT, Alodayni MA, AlMetwazi MS, et al. The utilization of complementary and alternative medicine among Saudi older adults: a population-based study. eCAM. 2020;2020:1–14.
16. Cheung CK, Wyman JF, Halcon LL. Use of complementary and alternative therapies in community-dwelling older adults. J Altern Complement Med. 2007;13(9):997–1006.
17. Rose JH, O’Toole EE, Skeist R, Pfeffer B, Carlsen WR. Complementary therapies for older adults: An exploratory survey of primary care physicians. Clin Gerontol. 1998;19(3).
18. Srinivasa N, Moyle W, Cooke M, O’Dwyer S. The effectiveness of Swedish massage with aromatic ginger oil in treating chronic low back pain in older adults: a randomized controlled trial. Complement Ther Med. 2014;22(1):26–33.
19. Frawley J, Peng W, Sibbritt D, Ward L, Lauche R, Zhang Y, et al. Is there an association between women’s consultations with a massage therapist and health-related quality of life? Analyses of 1800 women aged 56–61 years. J Bodyw Mov Ther. 2016;20(4):254–9.
20. Jefferson LL. Exploring effects of therapeutic massage and patient teaching in the practice of diaphragnmatic breathing on blood pressure, stress, and anxiety in hypertensive African-American women: an intervention study. J National Black Nurses Assoc. 2010;21(1):17–24.
21. Murphy V, Sibbritt D, Adams J, Broom A, Kirby E, Refshauge K. 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. Clin Rheumatol. 2014;33(2):253–62.
22. Kablan N, Alaca N, Tatar Y. Comparison of the immediate effect of peritessial massage and manual lymph drainage following exercise on biomechanical and viscoelastic properties of the rectus femoris muscle in women. J Sport Rehabil. 2021;30(5):725–30.
23. Givi M. Durability of Effect of Massage Therapy on Blood Pressure. Int J Preventive Med. 2013;4(5):511–6.
24. Xiong XJ, Li SJ, Zhang YQ. Massage therapy for essential hypertension: a systematic review. J Hum Hypertens. 2015;29(3):143–51.
25. Nebras F, Keltrim MR, Souza SA, Ikeda DS, Lorenzi-Filho G. Effects of massage therapy on sleep quality after coronary artery bypass graft surgery. Clinics (Sao Paulo, Brazil). 2010;65(11):1105–10.
26. Sibbritt D, van der Piet R, Dedhards H, Sritong K. Rehabilitation of stroke patients using traditional Thai massage, herbal treatments and physical therapies. Zhong Xi Yi Jie He Xue Bao = J Chinese Integrative Med. 2012;10(7):743–50.
27. Wardle JL, Sibbritt DW, Adams J. Referral to massage therapy in primary health care: a survey of medical general practitioners in rural and regional New South Wales, Australia. J Manipulative Physiol Ther. 2013;36(9):595–603.
28. Sibbritt D, Davidson P, DiGiacomo M, Newton P, Adams J. Use of Complementary and Alternative Medicine in Women With Heart Disease, Hypertension and Diabetes (from the Australian Longitudinal Study on Women’s Health). Am J Cardiol. 2015;115(12):1691–5 (S8).
29. Sibbritt D, Davidson P, Peng WB, Adams J, Hickman L. Hypertension: What are the self-care and health-care-seeking behaviours in women over time? J Hum Hypertens. 2016;30(12):783–7.
30. Rhee TG, Westberg SM, Harris IM. Complementary and alternative medicine in US adults with diabetes: reasons for use and perceived benefits. J Diabetes. 2018;10(4):310–9.
31. Sax Institute. 45 and Up Study NSW, Australia: The Sax Institute; 2016. Available from: https://www.saxinstitute.org.au/our-work/45-up-study/ [cited 2020 16 October].
32. Australian Bureau of Statistics. Australian Statistical Geography Standard (ASGS) Canberra: Australian Bureau of Statistics 2011. Available from: https://www.abs.gov.au/websitedbs/D3310114.nsf/home/Australian+Statistical+Geography+Standard+-+ASGS [cited 2020 18 October].
33. Australian Institute of Health and Welfare. Rural, regional and remote health: a guide to remoteness classifications. Canberra: Australian Institute of Health and Welfare; 2013. Available from: https://www.aihw.gov.au/reports/rural-remote-australians/guide-to-remoteness-classifications/summa ry [cited 2020 21 October].
34. Clemens S, Begum N, Harper C, Whitty JA, Scuffham PA. A comparison of EQ-5D-3L population norms in Queensland, Australia, estimated using utility value sets from Australia, the UK and USA. Qual Life Res. 2014;23(8):2375–81.
35. Devlin NJ, Brooks R. EQ-SD and the EuroQol Group: past, present and future. Appl Health Econ Health Policy. 2017;15:127–37.
36. Smith N, Young A, Lee C. Optimism, health-related hardness and well-being among older Australian women. J Health Psychol. 2004;9(6):741–52.
37. Brooks MV. Health-related hardness in individuals with chronic illnesses. Clin Nurs Res. 2008;17(2):98–117.
38. Kowalski CM, Schermer JA. Hardiness, perseverative cognition, anxiety, and health-related outcomes: a case for and against psychological hardiness. Psychol Rep. 2019;122(6):2096–118.
39. Frawley J, Adams J, Broom A, Steel A, Gallois C, Sibbritt D. Majority of women are influenced by nonprofessional information sources when deciding to consult a complementary and alternative medicine practitioner during pregnancy. J Altern Complement Med. 2014;20(7):571–7.
40. MacLennan AH, Wilson DH. Prevalence and cost of alternative medicine in Australia. Lancet. 1996;347(9001):569.
41. Skouteris H, Werthem EHT, Rallis S, Paxton SJ, Kelly L, Milgrom J. Use of complementary and alternative medicines by a sample of Australian women during pregnancy. Aust N Z J Obstet Gynaecol. 2008;48(4):384–90.
42. Xue CCL, Zhang AL, Lin V, Da Costa C, Story D. Complementary and alternative medicine use in Australia: a national population-based survey. J Altern Complement Med. 2007;13(6):643650.
43. Wardle JL, Sibbritt DW, Adams J. Referral to Massage Therapy in Primary Health Care: A Survey of Medical General Practitioners in Rural and Regional New South Wales, Australia. J Manipulative Physiological Therapeutics. 2013;36(9):595–603 (9p).
44. Adams J, Easthope G, Sibbritt D. Exploring the relationship between women’s health and the use of complementary and alternative medicine. Complement Ther Med. 2003;11(3):156–8.
45. Bell RA, Suerken CK, Grzywacz JG, Wei L, Quandt SA, Arcury TA. Complementary and Alternative Medicine among Saudi older adults: a population-based study. eCAM. 2020;2020:1–14.
46. Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, Van Rompuy M, et al. Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. JAMA. 1998;280(18):1569–75.
47. McCallie A, Williams J, McChesney J, Patten SB, Jette N. Use of complementary and alternative medicine use by those with a chronic disease and the general population - results of a national population based survey. BMC Complement Altern Med. 2010;10(1):1–6.
48. Hunt KJ, Coelho HF, Wider B, Perry R, Hung SK, Terry R, et al. Complementary and alternative medicine use in England: results from a national survey. Int J Clin Pract. 2010;64(11):1496–502.

49. Al-Windi A. Determinants of complementary alternative medicine (CAM) use. Complementary Therapies in Medicine. 2004;12(2–3):99–111 (13p).

50. Sibbritt DW, Adams J, Young AF. A Longitudinal Analysis of Mid-Age Women’s Use of Complementary and Alternative Medicine (CAM) in Australia, 1996–1998. Women Health. 2004;40(4):41–56.

51. Perlman Al, Ali A, Njike VY, Hom D, Davidi A, Gould-Fogerite S, et al. Massage Therapy for Osteoarthritis of the Knee: A Randomized Dose-Finding Trial. PLoS ONE. 2012;7(2):1–9.

52. Okoro CA, Zhao G, Li C, Balluz LS. Has the use of complementary and alternative medicine therapies by U.S. adults with chronic disease-related functional limitations changed from 2002 to 2007? J Altern Complement Med. 2013;19(3):217–23.

53. Cherkin DC, Deyo RA, Sherman KJ, Hart LG, Street JH, Hrbek A, et al. Characteristics of visits to licensed acupuncturists, chiropractors, massage therapists, and naturopathic physicians. J Am Board Fam Pract. 2002;15(6):463–72.

54. Sibbritt D, Adams J. Back pain amongst 8,910 young Australian women: a longitudinal analysis of the use of conventional providers, complementary and alternative medicine (CAM) practitioners and self-prescribed CAM. Clin Rheumatol. 2010;29(1):25–32.

55. Ali A, Rosenberger L, Weiss TR, Milak C, Perlman AI. Massage therapy and quality of life in osteoarthritis of the knee: a qualitative study. Pain Med. 2017;18(6):1168–75.

56. Perlman A, Fogerite SG, Glass O, Bechard E, Ali A, Njike VY, et al. Efficacy and safety of massage for osteoarthritis of the knee: a randomized clinical trial. J Gen Intern Med. 2019;34(3):379–86.

57. Blaszko Helming MA, Shields DA, Avino KM, Rosa WE. Dossey & Keegan’s Holistic Nursing: A Handbook for Practice. 8th ed. Burlington: Jones & Bartlett Learning; 2022. p. 950.

58. Harris M, Richards KC. The physiological and psychological effects of slow-stroke back massage and hand massage on relaxation in older people. J Clin Nurs. 2010;19(7–8):917–26.

59. Sointu E. Complementary and alternative medicines, embodied subjectivity and experiences of healing. Health: An Interdisciplinary Journal for the Social Study of Health. Illness Med. 2013;17(5):530–45.

Publisher’s Note
Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.