Advances in Integrative Medicine 13 (2026) 100590

Contents lists available at ScienceDirect

Advances in Integrative Medicine

journal homepage: www.elsevier.com/locate/aimed

Profile of patients presenting to Australian osteopaths: Results from a national health service use survey

Brett Vaughan [a,b,c,*], Michael Fleischmann [b,d], Niklas Sinderholm Sposato [b,e], Jerry Draper-Rodi [b,f,g], Kesava Kovanur Sampath [b,h,i], Loïc Treffel [b,j], Cindy McIntyre [b,f], Chantal Morin [b,k], Lee Muddle [b], Oliver P. Thomson [b,f]

[a] Department of Medical Education, University of Melbourne, Melbourne, Australia
[b] School of Public Health, University of Technology Sydney, Sydney, Australia
[c] Faculty of Health, Southern Cross University, Lismore, Australia
[d] School of Health and Biomedical Sciences, RMIT University, Melbourne, Australia
[e] Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden
[f] University College of Osteopathy, London, United Kingdom
[g] National Council for Osteopathic Research, London, United Kingdom
[h] Centre for Health and Social Practice, Waikato Institute of Technology, Te Pukenga, Hamilton, New Zealand
[i] Centre of Excellence in Manual and Manipulative Therapy, Duke University, United States
[j] Institut Toulousain d'Ostéopathie, IRF'O, Toulouse, France
[k] School of Rehabilitation, Faculty of Medicine and Health Sciences, Université de Sherbrooke, Sherbrooke, Qc, Canada

ARTICLE INFO

Keywords:
Allied health
Chronic disease
Health-related quality of life
Life satisfaction
Musculoskeletal disease
Subjective well-being

ABSTRACT

Background and purpose: Musculoskeletal conditions are one of the most common complaints affecting the Australian population. Affected individuals often seek care from a range of health professionals including osteopaths. Osteopaths provide care for musculoskeletal conditions using manual therapy, exercise, and patient education. The current study is a secondary analysis of data from an Australian health service use survey.
Materials & methods: Respondents were asked to indicate the range of health professionals they consulted during the period February 2021 and February 2022. Additional data collected from respondents related to demographic variables, presence of chronic conditions in addition to the Personal Wellbeing Index (PWI) and Short Form 20 (SF-20). Data were descriptively analysed based on whether the respondent reported consulting with an osteopath or not.
Results: In the period February 2021-February 2022, of the 2354 respondents, 143 (6.1 %) indicated they had consulted with an osteopath. Over half of those who consulted with an osteopath identified as female (51.7 %), had private health insurance (59.4 %) and/or a healthcare card (69.9 %). No significant difference was observed between respondents who consulted with an osteopath and those who did not for PWI scores ($p > 0.05$). SF-20 scores were significantly lower for those who consulted with an osteopath compared with those who did not ($p < 0.01$).
Conclusion: This secondary analysis contributes to our understanding of the profile of patients presenting to Australian osteopaths, particularly health related quality of life and subjective wellbeing of this patient cohort.

1. Introduction

Musculoskeletal complaints are a common condition in Australia, with chronic musculoskeletal conditions affecting over one-quarter of the population [6]. The most prevalent of these chronic musculoskeletal conditions is low back pain (approximately 16 % of the population), followed by arthritis (15 %) [6]. Musculoskeletal complaints also appear to be more prevalent among females and older adults (approximately 70 % over the age of 75 years) in the Australian population [6], including those receiving workers compensation [30], more so compared with other populations [18]. Furthermore, there is a significant financial and social burden associated with musculoskeletal

* Corresponding author at: Department of Medical Education, Parkville Campus, University of Melbourne, Parkville, Victoria 3010, Australia.
E-mail address: brett.vaughan@unimelb.edu.au (B. Vaughan).

https://doi.org/10.1016/j.aimed.2025.100590
Received 18 March 2024; Received in revised form 11 August 2025; Accepted 19 November 2025
Available online 20 November 2025

complaints [11].

Other chronic diseases often reported in the Australian population include asthma, cancer, cardiovascular disease, chronic obstructive pulmonary disease, diabetes, and mental health conditions [5]. Australian population data provides evidence of an association between chronic disease and musculoskeletal complaints, with up to 64 % of Australians with chronic low back pain, or 74 % of those with arthritis, experiencing at least one other chronic disease [5]. These observations suggest musculoskeletal care should be a key consideration in managing an individual's health and wellbeing, particularly in the presence of other chronic diseases.

Wellbeing, functional status and general health are also affected by the presence of musculoskeletal symptoms [13]. As a subjective measure, well-being encompasses a variety of health-related domains and life satisfaction [19]. Research suggests an association between lower life satisfaction and musculoskeletal complaints [12] and improving life satisfaction can assist with managing musculoskeletal issues [27]. In populations seeking osteopathy care, life satisfaction may be higher than the general population [50].

Osteopaths practicing in Australia are mainly accessed privately without referrals and provide care for patients using a range of interventions including manual therapy, exercise advice, and education [1,14,35]. While most patients seek osteopathy care for musculoskeletal complaints such as neck and low back pain of their own volition (i.e. not referred), some are referred by other health professionals for management of these complaints [14,35]. Internationally, literature explores patient profiles for those seeking osteopathy care [21], but in Australia, data is limited to only a few studies based on practitioner self-report [14,35] or practice audits [49]. This data suggests patients presenting to Australian osteopaths are likely to be experiencing one or more chronic diseases. Further, patients presenting to Australian osteopaths will likely seek care from other health professionals for the same or other health-related conditions [14].

Foley et al. [24] have provided data on the first wave of the Complementary Medicine Use, Health and Disclosure in the Australian Population survey conducted through the University of Technology Sydney (Australia). The current work is a secondary analysis of data from the second wave of the survey [42] focusing on the characteristics of respondents who indicated visiting an osteopath in the 12 months preceding the survey. The outcomes described contribute to the evolving picture of the patient profile presenting to Australian osteopaths.

Table 1
Demographic characteristics of patients who consulted an Australian osteopath in the 12 months prior to the survey ('consulters') compared with patients who did not consult an osteopath ('non-consulters).

	Consulters (n = 143)	Non-consulters (n = 2211)	p-value
Gender (n, %)			0.22
Male	65 (45.5 %)	1016 (46 %)	
Female	74 (51.7 %)	1174 (53.1 %)	
Non-binary	3 (2.1 %)	15 (0.7 %)	
Other	1 (0.7 %)	6 (0.3 %)	
Age (years)			<0.01
18–24 years	32 (22.4 %)	318 (22.4 %)	
25–34 years	41 (28.7 %)	420 (19.0 %)	
35–44 years	38 (26.6 %)	414 (18.7 %)	
45–54 years	11 (7.7 %)	258 (11.5 %)	
55–64 years	9 (6.3 %)	255 (11.5 %)	
65 years and over	12 (8.4 %)	546 (24.7 %)	
Private health insurance			<0.01
Yes	85 (59.4 %)	1047 (47.4 %)	
No	58 (40.6 %)	1164 (52.6 %)	
Ancillary cover ('yes')	161 (96.4 %)	2047 (92.6 %)	
Healthcare card			<0.01
Yes	100 (69.9 %)	1243 (56.2 %)	
No	43 (30.1 %)	968 (43.8 %)	
Highest qualification (n, %)			
No formal qualification	3 (2.1 %)	51 (2.3 %)	
Year 10 or equivalent	14 (9.8 %)	273 (12.3 %)	
Year 12 or equivalent	33 (23.1 %)	477 (21.6 %)	
Trade/apprenticeship	17 (11.9 %)	149 (6.7 %)	
Certificate/Diploma	25 (17.5 %)	569 (25.7 %)	
University degree	31 (21.7 %)	514 (23.2 %)	
Higher university degree	20 (14.0 %)	178 (8.1 %)	
Employment status			
Full time work (35 or more hours per week)	76 (53.1 %)	695 (31.4 %)	
Part time work (less than 35 h per week)	29 (20.3 %)	373 (16.9 %)	
Casual/temp work (irregular hours)	8 (5.6 %)	139 (6.3 %)	
Looking for work	13 (9.1 %)	179 (8.1 %)	
Not in the paid workforce	17 (11.9 %)	825 (37.3 %)	
Relationship status			
Never married	42 (29.4 %)	689 (31.2 %)	
Married (opposite sex)	54 (37.8 %)	860 (38.9 %)	
Married (same sex)	14 (9.8 %)	39 (1.8 %)	
De facto (opposite sex)	16 (11.2 %)	286 (12.9 %)	
De facto (same sex)	1 (0.7 %)	34 (1.5 %)	
Separated	7 (4.9 %)	65 (2.9 %)	
Divorced	5 (3.5 %)	173 (7.8 %)	
Widowed	4 (2.8 %)	65 (2.9 %)	
Financial management			
It is impossible	18 (12.6 %)	85 (3.8 %)	
It is difficult all of the time	33 (23.1 %)	327 (14.8 %)	
It is difficult some of the time	54 (37.8 %)	658 (29.8 %)	
It is not too bad	23 (16.1 %)	807 (36.5 %)	
It is easy	15 (10.5 %)	334 (15.1 %)	

2. Methods

The study is a secondary analysis of data from a nationally representative health use and experiences survey for persons over the age of 18 years. The data collection for the survey was approved by the University of Technology Sydney Human Research Ethics Committee (ETH21-6461).

2.1. Participants

To be eligible to participate, individuals needed to reside in Australia, have a sufficient level of English to complete the survey (i.e. complete medical forms unassisted), and were over the age of 18 years.

Between February 4 and February 18, 2022, participants were enlisted through a survey panel company, Qualtrics, utilising a pre-existing database of individuals who had indicated their interest in engaging in research. Purposive convenience sampling was utilised to obtain a sample broadly reflecting the Australian population in terms of gender, age, and state of residence. Before taking the survey, participants had to fulfill informed consent requirements. The survey panel company offered a modest financial incentive (AUD$3 - $4) and redeemable points to participants, contingent on the time taken to complete the survey.

2.2. Survey

The survey was developed by a group of experienced health service researchers for the purposes of the initial study (external to the current study) [24]. The items comprising the survey addressed four domains: participant demographics, health service use, health status, and health consultation characteristics. The survey comprised 63 questions.

For the demographics, participants were asked to indicate their age, gender, relationship status, ability to manage financially, employment status, and highest qualification. Participants were also invited to

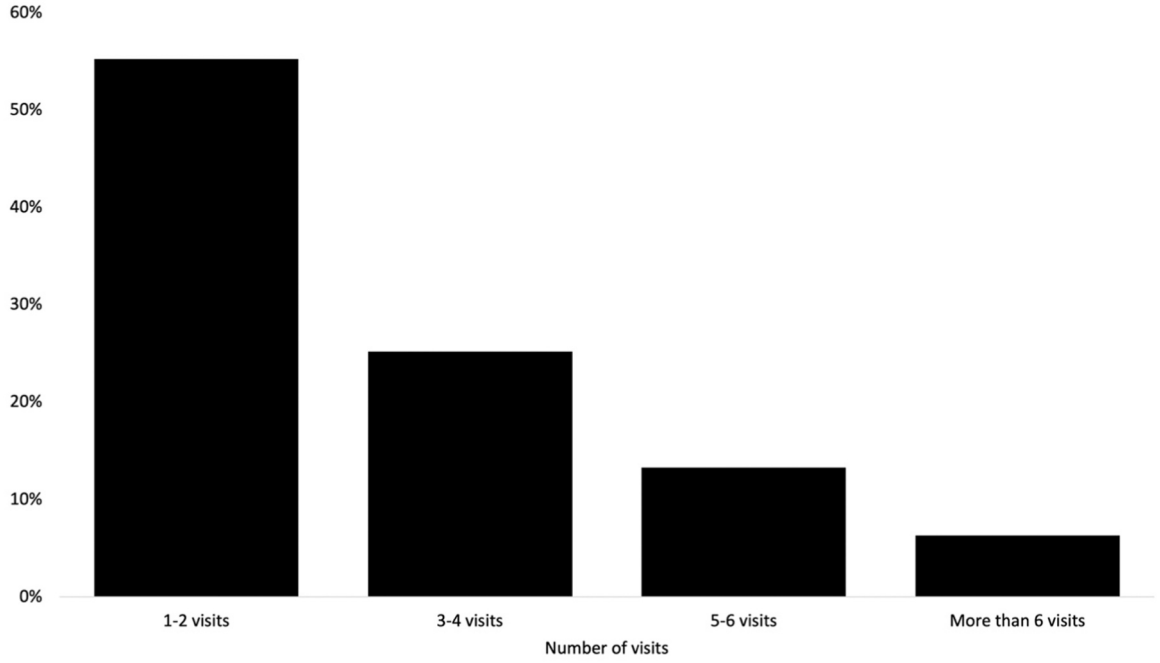

Fig. 1. Frequency of visits to Australian osteopaths in the twelve-month period from February 2021 to February 2022.

indicate whether they held private health insurance cover or a health care card.[1] The health service use items were related to consultations in the last 12 months across a range of health professionals including general practitioners, complementary medicine professionals such as naturopaths, and allied health professionals such as physiotherapists and osteopaths.

With respect to health status, the survey utilised the Personal Wellbeing Index (PWI) [15] and the SF-20 [44]. The PWI is a nine-item questionnaire measuring subjective wellbeing across health, standard of living, spirituality, personal relationships and security, and an overall life satisfaction item [15]. The questionnaire has previously been tested in the Australian population [15,34]. The SF-20 is a widely used measure of health-related quality of life (HRQoL) across six domains physical health, role function, social function, mental health, health perception and pain.

For the health consultation characteristics, respondents were asked to indicate the health professionals they had consulted with in the previous 12 months, and for each health profession, the reason for consultation (acute/chronic, i.e. less than/greater than 3 months), and format of the consultation (in-person, telehealth). The current study reports on these characteristics for respondents who indicated consulting an osteopath in the previous 12 months.

2.3. Data analysis

All responses to the survey (N = 2569) were reviewed and cleaned. Several variables were re-categorised (i.e. chronic illness, relationship status) into broader groupings for the analysis. The PWI was scored as per Misajon et al. [34], that is, the overarching life satisfaction item and religion and spirituality items were scored separately from the other seven items. Total scores for each SF-20 domain were calculated as per the scoring guide [16]. Descriptive statistics were generated for each of the survey items, with the item of interest for the current secondary analysis being the respondent indicating they had visited an osteopath in the previous 12 months. Inferential statistics were used to evaluate any difference between the entire survey sample and the osteopathy visit cohort for age, gender, having private health insurance, and having a health care card using Chi-square. The Mann-Whitney *U* was used to evaluate differences between consulters and non-consulters for the PWI items 1 and 9 and total score, and the SF-20 domains. Statistical significance was set at $p < 0.05$ and non-parametric effect sizes (r) [53] calculated where relevant. Missing data were not imputed. All analyses were conducted in SPSS version 29 (IBM Corp USA).

3. Results

Cleaning of the survey responses resulted in 2354 available for analysis. In the previous 12 months, 143 respondents (6.1 %) indicated they had consulted with an osteopath. Demographic characteristics for those who indicated having consulted with an osteopath ('consulters') (n = 143), and the non-consulters (n = 2211) are presented in Table 1. For key demographic variables, respondents who consulted with an osteopath were more likely to indicate having private health insurance (χ^2=7.86, $p < 0.01$) and a healthcare card (χ^2=10.30, $p < 0.01$). Regarding age, respondents aged 25–44 years were more likely to report visiting an osteopath, whereas those aged 45 and over were less likely to report visiting an osteopath in the preceding 12 months. No difference between consulters or non-consulters was observed for gender (χ^2=4.42, $p = 0.22$)

Respondents indicated the reason for their visit to an osteopath was for an acute complaint (n = 28, 19.6 %), chronic complaint (n = 41, 28.7 %) and to improve wellbeing (n = 23, 16.1 %). The mean out-of-pocket cost for osteopathy consultations by respondents was AUD $116.12 (+/- AUD$154.77). The frequency of visits to an osteopath over the 12-month period is presented in Fig. 1 with over half of the consulters indicating 1–2 visits. Fourteen respondents (n = 14, 9.8 %) indicated attending a telehealth consultation with an osteopath in the preceding 12 months.

The co-morbid conditions of respondents presenting to Australian osteopaths in the 12 months prior are presented in Table 2. The most common conditions reported by consulters were sleep disorders (18.9 %) and non-insulin dependent diabetes (18.9 %).

Subjective well-being (Personal Wellbeing Index) and health-related

[1] A health care card is provided to individuals of limited financial means or with long-term disabilities or conditions in order to be able to access affordable healthcare and medicines.

Table 2
Frequency of co-morbid conditions reported by patients presenting to Australian osteopaths between February 2021 and February 2022.

	Consulters (n = 143)	Non-consulters (n = 2211)
Condition	**N (%)**	**N (%)**
Type 1 diabetes mellitus	16 (11.2 %)	36 (1.6 %)
Non-insulin dependent diabetes	27 (18.9 %)	128 (5.8 %)
Insulin-dependent diabetes	24 (16.8 %)	62 (2.8 %)
Cancer (benign)	14 (9.8 %)	76 (3.4 %)
Cancer (malignant)	17 (11.9 %)	76 (3.4 %)
Heart disease	14 (9.8 %)	102 (4.6 %)
Hypertension (high blood pressure)	15 (10.5 %)	407 (18.4 %)
Dyslipidaemia (high cholesterol/ triglycerides)	13 (9.1 %)	173 (7.8 %)
COVID-19	19 (13.3 %)	169 (7.6 %)
Chronic fatigue syndrome/myalgic encephalomyelitis	4 (2.8 %)	52 (2.3 %)
Fibromyalgia	5 (3.5 %)	44 (2.0 %)
Migraine	15 (10.5 %)	220 (9.9 %)
Autoimmune condition	7 (4.9 %)	77 (3.5 %)
Osteoarthritis	10 (7.0 %)	215 (9.7 %)
Other musculoskeletal condition	8 (5.6 %)	94 (4.2 %)
Asthma	18 (12.6 %)	207 (9.3 %)
Bronchitis	5 (3.5 %)	62 (2.8 %)
Other respiratory condition	5 (3.5 %)	99 (4.5 %)
Irritable bowel syndrome (IBS)	4 (2.8 %)	92 (4.2 %)
Inflammatory bowel disease (Crohn's, ulcerative colitis)	5 (3.0 %)	22 (0.9 %)
Coeliac disease	3 (2.1 %)	15 (0.6 %)
Gastro-oesophageal reflux disease (GERD/ GORD)	5 (3.5 %)	140 (6.3 %)
Chronic constipation	3 (2.1 %)	41 (1.8 %)
Other gastrointestinal condition	3 (2.1 %)	43 (1.9 %)
Mood disorder (e.g. depression)	18 (12.6 %)	297 (13.4 %)
Anxiety disorder	24 (16.8 %)	442 (20.0 %)
Sleep disorder	27 (18.9 %)	289 (13.1 %)
Substance use disorder	7 (4.9 %)	34 (1.5 %)
Schizophrenia or other psychotic disorder	3 (2.1 %)	39 (1.7 %)
Other mental health condition	4 (2.8 %)	177 (8.0 %)
Other long-term health condition	10 (7.0 %)	200 (9.0 %)
None	20 (14.0 %)	827 (37.4 %)
Sex-specific conditions		
Endometriosis	2 (1.4 %)	43 (1.9 %)
Polycystic ovary syndrome (PCOS)	6 (4.2 %)	53 (2.4 %)
Other female reproductive health condition	7 (4.9 %)	49 (2.2 %)
Benign prostatic hyperplasia (enlarged prostate)	5 (3.5 %)	46 (2.1 %)
Other male reproductive health condition	4 (2.8 %)	22 (0.9 %)

quality of life (SF-20) for patients who presented to an osteopath in the past 12 months compared with those who did not, are described in Table 3. Overall self-reported general health for respondents who consulted an osteopath versus those who did not is presented in Fig. 2. No significant differences were identified for the PWI total score (Z = -0.31, p = 0.75), nor for item 1 *How satisfied are you with your life as a whole?* (Z = -0.72, p = 0.47) and item 9 *How satisfied are you with your spirituality and religion?* (Z = -0.17, p = 0.86) between consulters and non-consulters. Respondents who consulted with an osteopath in the preceding 12 months demonstrated statistically significant lower mean scores (except for the Pain subscale) across all SF-20 domains compared to non-consulters, with small to medium effect sizes (Table 3).

Respondents who reported consulting with an osteopath in the previous 12 months also indicated consulting with a range of other health professionals (Table 4). Of the health professionals in Table 4, the most commonly consulted by respondents who had seen an osteopath in the previous 12 months was a general practitioner (89.5 %) and the least common was a homeopath (49.6 %).

4. Discussion

The current study draws on data from a large sample of Australians[2] who sought health care from a variety of primary and specialist medical, allied health and complementary medicine professionals. There were 2354 respondents with clean data, and of these 6.1 % reported having visited an osteopath in the preceding 12 months. This rate of consultation with an osteopath is consistent with other Australian data where similar rates have been observed [24,25,52].

The current study adds to the increasing understanding of the profile of patients who consult an osteopath. In particular, the study provides additional demographic insights to the patients seeking osteopathy care. Over half of the respondents in the current study who consulted an osteopath identified as female. This is consistent with other Australian data seeking care from an allied health professional [7]. From an osteopathy perspective, data from an Australian student-led osteopathy clinic is in accord with the gender identification in the current work (54.9 %) [49], but less than the 60 % reported by Orrock [35] and 67 % reported by Burke et al. [14]. Together these results suggest it is likely between 50 % and 60 % of patients presenting to Australian osteopaths will identify as female. Patients presenting to Australian osteopaths aged between 18 and 44 years accounted for over three-quarters of respondents. This age demographic appears consistent with data from both Orrock [35] and Burke et al. [14], along with the observation of a decreasing number of older patients seeking osteopathy care. Reasons for this drop may be associated with increasing care needs for non-musculoskeletal issues or a perception amongst older adults that osteopathy care may not be suitable for their needs. However, both assertions would require additional investigation. This age profile differs markedly from osteopathic patient demographics reported in European studies. For instance, UK data [37] shows patients aged 20–39 years comprise only 23.5 % of consultations compared to 77.7 % in the 18–44 age group in our study, with mean patient ages of 40 years in Spain and 45 years in the UK and Switzerland [21]. This suggests important regional differences in osteopathic care utilization patterns that warrant further investigation. These international variations may reflect differences in healthcare systems, osteopathic scope of practice, cultural attitudes toward manual therapy, or referral patterns, highlighting the need for country-specific research to inform osteopathic workforce planning and service delivery. More 65 + year old patients appear to be seeking care in some countries [21]. Further research is needed to better understand why older adults may not proactively seek osteopathy care where indicated, and the role for osteopaths in care for older adults [43], for example in arthritis management, and falls prevention.

Respondents who reported seeking osteopathy care in the current study were more likely to have private health insurance and/or have a healthcare card (HCC) than those who did not seek out osteopathy care. Over 55 % of the Australian population had some form of private health insurance at the time of data collection [8]. Osteopathy care is covered by Australian private health insurers under the ancillary or 'extras' cover – 96 % of consulters reported having ancillary cover. Having private health insurance with ancillary cover is likely to make osteopathy care more accessible and affordable for patients. Further, having private health insurance may also be an indicator of higher levels of health literacy [51]. These results suggest having private health insurance is one of the key payment strategies allowing patients to access osteopathy care. There were high rates of respondents having a HCC which is usually provided for those on a low income and/or with chronic health conditions. This may also make osteopathy care more affordable, as practices may offer a discount for HCC holders. Additional research is required to establish how having private health insurance or a HCC influences patient care choices.

[2] There were approximately 26 million Australians at the time of data collection.

Table 3
Self-reported life satisfaction (Personal Wellbeing Index) and health-related quality of life (SF-20) of patients who reported consulting with an osteopath during the period February 2021 to February 2022 ('consulters') versus those who did not consult with an osteopath ('non-consulters').

	Consulters			Non-consulters		
	Mean (SD)	**Median**	**Range**	**Mean (SD)**	**Median**	**Range**
Personal Wellbeing Index (PWI)						
How satisfied are you with…						
1. …your life as a whole?	6.42 (2.24)	6	0–10	6.46 (2.41)	7	0–10
2. …your standard of living?	6.50 (2.19)	6	0–9	6.74 (2.36)	7	0–10
3. …your health?	6.36 (2.43)	7	0–10	6.08 (2.41)	6	0–10
4. …what you are achieving in life?	6.46 (2.38)	6	0–10	6.22 (2.56)	7	0–10
5. …your personal relationships?	6.63 (2.37)	7	0–10	6.71 (2.70)	7	0–10
6. …how safe you feel?	6.84 (2.40)	7	0–10	7.34 (2.32)	8	0–10
7. …feeling part of your community?	6.32 (2.40)	6	1–10	6.05 (2.61)	6	0–10
8. …your future security?	6.44 (2.43)	7	1–10	6.20 (2.60)	7	0–10
9. …your spirituality and religion?	6.83 (2.59)	7	0–10	6.73 (2.89)	7	0–10
PWI Total (items 2–8)	45.54 (13.41)	46	12–70	45.34 (14.25)	48	0–70
Short-Form 20 (SF-20) subscales						
Physical[a]	48.83 (24.41)	50	0–100	73.27 (31.32)	83.33	0–100
Role function[b]	43.53 (35.81)	50	0–100	73.60 (38.50)	100	0–100
Social function[c]	43.36 (34.88)	40	0–100	75.02 (31.47)	100	0–100
Mental health[d]	47.92 (19.76)	52	0–100	60.16 (15.86)	60	0–100
Health perception[e]	45.35 (14.15)	45	0–95	50.92 (11.23)	50	0–100
Pain[f]	35.80 (20.94)	40	0–80	25.98 (20.09)	20	0–80

[a] $Z = -9.34$, $p < 0.01$, $r = 0.19$.
[b] $Z = -9.85$, $p < 0.01$, $r = 0.20$.
[c] $Z = -10.46$, $p < 0.01$, $r = 0.22$.
[d] $Z = -7.38$, $p < 0.01$, $r = 0.15$.
[e] $Z = -4.41$, $p < 0.01$, $r = 0.09$.
[f] $Z = -5.44$, $p < 0.01$, $r = 0.11$.

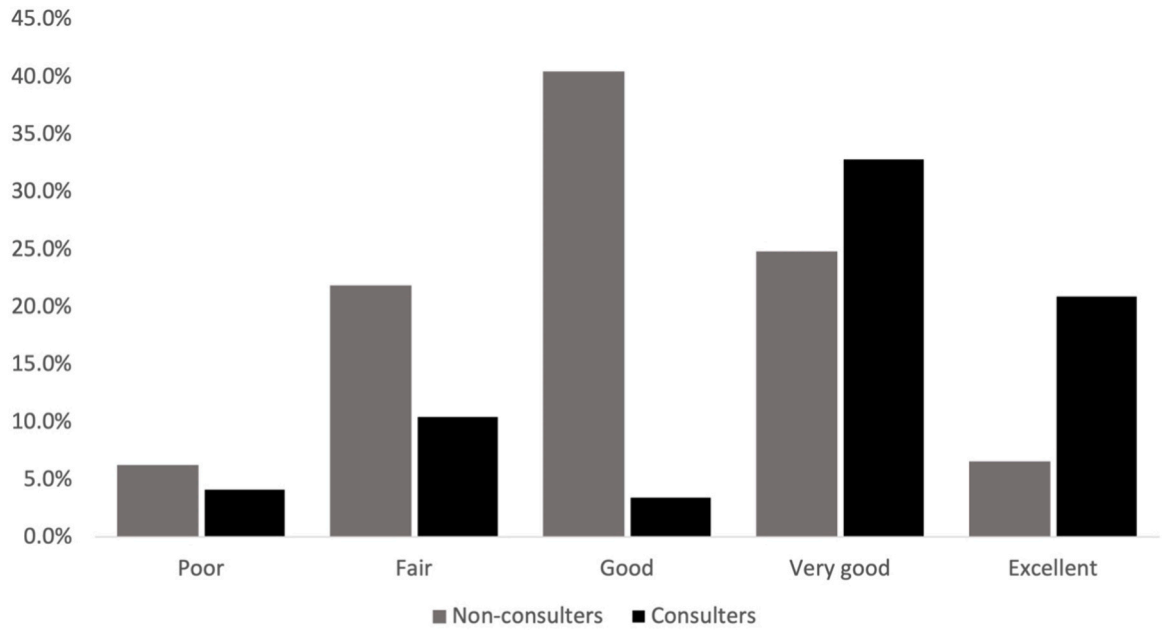

Fig. 2. Self-rated general health of patients who reported consulting with an osteopath during the period February 2021 to February 2022 ('consulters') versus those who did not consult with an osteopath ('non-consulters').

Subjective well-being (SWB) was evaluated in the current study through the Personal Wellbeing Index [15]. There was a similarity in reported SWB, life satisfaction and spiritual/religious satisfaction from respondents whether an individual sought osteopathy care or not. This outcome suggests seeking healthcare is not associated, or has a very small association, with SWB in an Australian context. However, life satisfaction is associated with higher levels of self-reported general health, reduced incidence of chronic conditions, and exhibiting positive health behaviours in the Australian population [41]. Previous work in an Australian osteopathy patient population suggests age, gender, and complaint chronicity are not associated with life satisfaction [50]. However, work by Espí-López et al. [22] suggests manual therapy care may have a positive impact on life satisfaction following treatment for tension-type headaches. Outcomes from the current and previous work suggest subjective well-being including life satisfaction, should continue to be explored to better understand its relationship to care seeking and outcomes of musculoskeletal care.

Chronic disease is a significant public health concern with nearly one-in-two Australians experiencing a chronic disease [4]. Patients presenting to Australian osteopaths are likely to be experiencing one or

Table 4
Health professionals consulted by patients who reported consulting an osteopath in the period between February 2021 and February 2022.

	Consulters (n = 143)	Non-consulters (n = 2211)
Health professional	**N (%)**	**N (%)**
General practitioner	128 (89.5 %)	1928 (87.2 %)
Specialist medical practitioner	99 (69.2 %)	754 (34.1 %)
Pharmacist	122 (85.3 %)	1595 (72.1 %)
Counsellor or mental health worker	95 (66.4 %)	271 (12.2 %)
Community nurse or nurse practitioner	87 (60.8 %)	144 (6.5 %)
Physiotherapist	86 (60.1 %)	239 (10.8 %)
Chiropractor	82 (57.3 %)	81 (3.6 %)
Dietician	77 (53.8 %)	36 (1.6 %)
Massage therapist	96 (67.1 %)	158 (7.1 %)
Acupuncturist	86 (60.1 %)	11 (0.5 %)
Naturopath	77 (53.8 %)	12 (0.5 %)
Western herbal medicine practitioner	80 (55.9 %)	7 (0.3 %)
Traditional Chinese medicine practitioner	77 (53.8 %)	13 (0.6 %)
Homeopath	71 (49.6 %)	4 (0.02 %)

more chronic conditions [14,35,49], beyond their primary presentation to an osteopath. In the current study, non-insulin dependent diabetes and sleep disorders were the most prevalent. Diabetes affects approximately 5 % of the Australian population [17]. The rate of non-insulin dependent diabetes is higher in consulters in the current work versus non-consulters and the general Australian population; however, it may be due to the reported association between diabetes and musculoskeletal disorders [9]. Ongoing research examining osteopathic support for patients with painful diabetic neuropathy may provide better understanding of the therapeutic benefits osteopathic care can offer this patient group [28]. Sleep disorders were also one of the most common chronic complaints in the consulter cohort (18.9 %). This observation is largely consistent with the Australian population (20 %) [3] and higher than reported with patients seeking complementary medicine care (13 %) [31]. Research also suggests the presence of a sleep disorder is likely to be associated with other co-morbidities, including mental health complaints, cardiovascular conditions, and arthritis [3,38]. Given the association between sleep disorders and musculoskeletal health [40] it would be beneficial to educate osteopaths about sleep disorders in pre-professional training and professional development [32]. Further, osteopaths should routinely include a sleep history as part of their clinical history. This may enable osteopaths to provide counselling about health behaviours impacting sleep [2,26], and ensure appropriate referral and further care, particularly as rates of assessment and treatment for sleep disorders are low [33].

The self-reported HRQoL was evaluated in the current study using the SF-20. Consulters demonstrated statistically significant higher pain domain scores and lower scores for each of the SF-20 domains compared with non-consulters. These differences were observed in the first version of the survey used in the current work in 2017, when comparing respondents who sought complementary medicine care compared with those who did not [24]. Consulters more frequently indicated their general health was *Very Good* or *Excellent*, compared with non-consulters in the current work. This observation is consistent with other research in complementary medicine [24], osteopathy [49] and physical therapy [45]. The self-rated general health of consulters is largely consistent with the Australian population where respondents to the 2022 National Health Survey [4] indicated *Very Good/Excellent* (51.5 %) and Fair/Poor (15.0 %). These results suggest individuals seeking osteopathy care are broadly comfortable with their overall general health but experience more significant limitations in the domains comprising the HRQoL construct. Given the observations in the current work, osteopaths need to utilise patient-reported outcome measures [23] to ascertain the most affected HRQoL domains. Although it is asserted osteopaths provide individualised, patient-centred care within a biopsychosocial framework [10,29], or whole person care, there is little empirical evidence support this occurrence in practice [20,36,39,46]. Use of patient-reported outcome measures evaluating the HRQoL domains may have the potential to inform individualised care that is patient-centred and underpinned by a biopsychosocial framework.

The current study also contributes to our understanding of other Australian health professionals involved in the care of patients who also attend an osteopath. This work varies from other studies about patients presenting to Australian osteopaths in that the respondents are the patients themselves, rather than practitioner-reported or audit data [14,35,49]. Of note in the current study is consulters indicated seeking care from other musculoskeletal-focused allied health professionals – physiotherapists and chiropractors. What cannot be determined in the current study is whether patients are seeking co-located health professionals or from another practice, and for the same or different complaints. Either situation – care for the same or different musculoskeletal complaints - is plausible [48] and future research could explore the complaints and care seeking behaviours of patients who seek combinations of osteopathy, chiropractic and physiotherapy [47].

The limitations of the study relate predominately to the self-report nature of the data and recall bias given respondents were asked to indicate the health professionals they sought care from in the preceding 12 months, and the volume of services provided by those health professionals, along with the out-of-pocket costs. Access to data from the patient file could be used to corroborate the self-report data. Other variables such as HRQoL and subjective well-being may relate to the time of completion of the survey rather than the time the respondent sought out care from a health professional. As such, these variables may have differed over the 12-month recall period of the survey and future work could reduce this duration to potentially reduce recall bias.

5. Conclusion

The study provides additional data describing the patient profile seeking osteopathy care in Australia. The current work supports other literature suggesting patients seeking osteopathy care are more likely to identify as female, be younger to middle-aged, self-report very good to excellent general health and have private health insurance. The rates of chronic disease in patients seeking osteopathy care likely reflect this younger profile. This study also highlights that patients seeking osteopathy care are also likely to seek care from other health professionals, whether it be for the same or other complaints. Based on the findings of the study, additional research is required to better understand how the demographic, subjective well-being and HRQoL variables evaluated in the current work are associated with, if at all, outcomes of osteopathy care. There is also an opportunity to explore whether and how osteopaths are involved in multidisciplinary or interprofessional care for individual patients, alongside gaining insights into patients' perspectives of this care. Additionally, a subsequent survey wave could be conducted specifically with individuals seeking osteopathic treatment.

CRediT authorship contribution statement

Brett Vaughan: Writing – review & editing, Writing – original draft, Resources, Project administration, Investigation, Formal analysis, Data curation, Conceptualization. **Chantal Morin:** Writing – review & editing, Writing – original draft. **Cindy McIntyre:** Writing – review & editing, Writing – original draft. **Thomson Oliver P:** Writing – review & editing, Writing – original draft. **Lee Muddle:** Writing – review & editing, Writing – original draft. **Jerry Draper-Rodi:** Writing – review & editing, Writing – original draft, Visualization, Formal analysis, Data curation, Conceptualization. **Niklas Sinderholm Sposato:** Writing – review & editing, Writing – original draft, Visualization, Investigation,

Formal analysis, Data curation, Conceptualization. **Loïc Treffel:** Writing – review & editing, Writing – original draft. **Kesava Kovanur Sampath:** Writing – review & editing, Writing – original draft. **Michael Fleischmann:** Writing – review & editing, Writing – original draft, Visualization, Investigation, Formal analysis, Data curation, Conceptualization.

Ethics

The data collection for the survey was approved by the University of Technology Sydney Human Research Ethics Committee (ETH21-6461).

Funding

No funding was received for the secondary analysis undertaken as part of this study.

Declaration of Competing Interest

The authors declare no conflict of interest in relation to the manuscript.

Acknowledgements

The authors would like to thank Associate Professor Amie Steel at the University of Technology Sydney (Australia) for support of the study.

References

[1] J. Adams, D. Sibbritt, A. Steel, W. Peng, A workforce survey of Australian osteopathy: analysis of a nationally-representative sample of osteopaths from the Osteopathy Research and Innovation Network (ORION) project, BMC Health Serv. Res. 18 (1) (2018) 352, https://doi.org/10.1186/s12913-018-3158-y.

[2] J. Adams, D. Sibbritt, A. Steel, W. Peng, Practitioner and practice characteristics of Australian osteopaths who discuss lifestyle factors with patients: findings from a national practice-based research network, Health Soc. Care Community 30 (4) (2022) e1335–e1342, https://doi.org/10.1111/hsc.13540.

[3] S.L. Appleton, T.K. Gill, C.J. Lang, A.W. Taylor, R.D. McEvoy, N.P. Stocks, D. A. González-Chica, R.J. Adams, Prevalence and comorbidity of sleep conditions in Australian adults: 2016 Sleep Health Foundation national survey, Sleep. Health 4 (1) (2018) 13–19, https://doi.org/10.1016/j.sleh.2017.10.006.

[4] Australian Bureau of Statistics. (2023). *National Health Survey*. Australian Bureau of Statistics,. Retrieved 21 December, 2023, from ⟨https://www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey/latest-release⟩.

[5] Australian Institute of Health and Welfare. (2023a). *Chronic conditions and multimorbidity*. Australian Institute of Health and Welfare,. Retrieved 18 December, 2023, from ⟨https://www.aihw.gov.au/reports/australias-health/chronic-conditions-and-multimorbidity⟩.

[6] Australian Institute of Health and Welfare. (2023b). *Chronic musculoskeletal conditions*. Australian Institute of Health and Welfare,. Retrieved 21 December, 2023, from ⟨https://www.aihw.gov.au/reports/chronic-musculoskeletal-conditions/musculoskeletal-conditions/contents/summary⟩.

[7] Australian Institute of Health and Welfare. (2023c). *General practice, allied health and other primary care services*. Australian Institute of Health and Welfare,. Retrieved 18 December, 2023, from ⟨https://www.aihw.gov.au/reports/primary-health-care/general-practice-allied-health-and-other-primary-c⟩.

[8] Australian Prudential Regulation Authority, Quarterly private health insurance statistics, Australian Prudential Regulation Authority, 2023. ⟨https://www.apra.gov.au/quarterly-private-health-insurance-statistics⟩. Retrieved 21 December, 2023, from.

[9] M. Azami, A. Moradkhani, M. Afraie, L. Saed, M.A. Tapak, K. Khoramipoor, S. Khateri, Y. Moradi, The association between diabetes mellitus and musculoskeletal disorders: a systematic review and meta-analysis, Front. Endocrinol. 15 (2024) 1320468, https://doi.org/10.3389/fendo.2024.1320468.

[10] A. Bergna, M. Galli, F. Todisco, F. Berti, Beliefs and use of palpatory findings in osteopathic clinical practice: a qualitative descriptive study among Italian osteopaths, Healthcare 10 (9) (2022), https://doi.org/10.3390/healthcare10091647.

[11] F.M. Blyth, A.M. Briggs, C.H. Schneider, D.G. Hoy, L.M. March, The global burden of musculoskeletal pain—where to from here? Am. J. Public Health 109 (1) (2019) 35–40, https://doi.org/10.2105/AJPH.2018.304747.

[12] A.M. Boonstra, M.F. Reneman, R.E. Stewart, M.W. Post, H.R.S. Preuper, Life satisfaction in patients with chronic musculoskeletal pain and its predictors, Qual. Life Res. 22 (1) (2013) 93–101, https://doi.org/10.1007/s11136-012-0132-8.

[13] A.M. Briggs, M.J. Cross, D.G. Hoy, L. Sànchez-Riera, F.M. Blyth, A.D. Woolf, L. March, Musculoskeletal Health Conditions Represent a Global Threat to Healthy Aging: A Report for the 2015 World Health Organization World Report on Ageing and Health, Gerontologist 56 (ement 2) (2016) S243–S255, https://doi.org/10.1093/geront/gnw002.

[14] S.R. Burke, R. Myers, A.L. Zhang, A profile of osteopathic practice in australia 2010-2011: a cross sectional survey, BMC Musculoskelet. Disord. 14 (2013) 227, https://doi.org/10.1186/1471-2474-14-227.

[15] R.A. Cummins, R. Eckersley, J. Pallant, J. van Vugt, R. Misajon, Developing a National Index of Subjective Wellbeing: The Australian Unity Wellbeing Index, Soc. Indic. Res. 64 (2) (2003) 159–190, https://doi.org/10.1023/A:1024704320683.

[16] A. Davies, C. Sherbourne, J. Peterson, J.E. Ware Jr., Scoring manual: Adult health status and patient satisfaction measures used in RAND's Health Insurance Experiment (N-2190-HHS), R. Corporation, 1988.

[17] W.A. Davis, K.E. Peters, A. Makepeace, S. Griffiths, C. Bundell, S.F.A. Grant, S. Ellard, A.T. Hattersley, S.A. Paul Chubb, D.G. Bruce, T.M.E. Davis, Prevalence of diabetes in Australia: insights from the Fremantle Diabetes Study Phase II, Intern. Med. J. 48 (7) (2018) 803–809, https://doi.org/10.1111/imj.13792.

[18] K. de Luca, A.M. Briggs, S.D. French, M.L. Ferreira, M. Cross, F. Blyth, L. March, Disability burden due to musculoskeletal conditions and low back pain in Australia: findings from GBD 2019, Chiropr. Man. Ther. 30 (1) (2022) 22, https://doi.org/10.1186/s12998-022-00434-4.

[19] E. Diener, S.J. Heintzelman, K. Kushlev, L. Tay, D. Wirtz, L.D. Lutes, S. Oishi, Findings all psychologists should know from the new science on subjective well-being, Can. Psychol. Rev. Psychol. Can. 58 (2) (2017) 87–104, https://doi.org/10.1037/cap0000063.

[20] M. Dinis, C. Silva, R. Cruz, J. Esteves, A. Nunes, The Portuguese osteopaths' attitudes towards a biomechanical or biopsychosocial model in the approach of chronic low back pain – a cross-sectional questionnaire-based survey, Int. J. Osteopath. Med. 45 (2022) 17–24, https://doi.org/10.1016/j.ijosm.2022.06.001.

[21] J. Ellwood, D. Carnes, An international profile of the practice of osteopaths: a systematic review of surveys, Int. J. Osteopath. Med. 40 (2021) 14–21, https://doi.org/10.1016/j.ijosm.2021.03.007.

[22] G.V. Espí-López, C. Rodríguez-Blanco, O.-P.-V. A, F. Molina-Martínez, D. Falla, Do manual therapy techniques have a positive effect on quality of life in people with tension-type headache? A randomized controlled trial, Eur. J. Phys. Rehabil. Med. 52 (4) (2016) 447–456.

[23] M. Fleischmann, B. Vaughan, The challenges and opportunities of using patient reported outcome measures (PROMs) in clinical practice, Int. J. Osteopath. Med. 28 (2018) 56–61, https://doi.org/10.1016/j.ijosm.2018.03.003.

[24] H. Foley, A. Steel, E. McIntyre, J. Harnett, D. Sibbritt, J. Wardle, J. Adams, Complementary medicine practitioner consultations amongst 1,314 individuals with chronic conditions: characteristics of users, reasons for and predictors of use, Complement. Ther. Clin. Pract. 40 (2020) 101194, https://doi.org/10.1016/j.ctcp.2020.101194.

[25] J. Frawley, T. Sundberg, A. Steel, D. Sibbritt, A. Broom, J. Adams, Prevalence and characteristics of women who consult with osteopathic practitioners during pregnancy; a report from the Australian Longitudinal Study on Women's Health (ALSWH), J. Bodyw. Mov. Ther. 20 (1) (2016) 168–172, https://doi.org/10.1016/j.jbmt.2015.03.004.

[26] J.M. Fuller, K.K. Wong, I. Krass, R. Grunstein, B. Saini, Sleep disorders screening, sleep health awareness, and patient follow-up by community pharmacists in Australia, Patient Educ. Couns. 83 (3) (2011) 325–335, https://doi.org/10.1016/j.pec.2011.05.004.

[27] J. Heikkinen, R. Honkanen, L. Williams, J. Leung, P. Rauma, S. Quirk, H. Koivumaa-Honkanen, Depressive disorders, anxiety disorders and subjective mental health in common musculoskeletal diseases: a review, Maturitas 127 (2019) 18–25, https://doi.org/10.1016/j.maturitas.2019.05.011.

[28] D. Hohenschurz-Schmidt, S. Smith, A.B. Schmid, P. Bright, J. Draper-Rodi, M. C. Evans, H. Kemp, N.K. Esteves, E. Pigott, W. Scott, J. Vollert, E. Williamson, E. M. Pogatzki-Zahn, S. Vogel, A multimodal intervention of manual therapy, exercise, and psychological management for painful diabetic neuropathy: intervention development and feasibility trial protocol, Pain. Manag. 15 (7) (2025) 387–399, https://doi.org/10.1080/17581869.2025.2515010.

[29] T. Liem, L. Christian, Reconceptualizing principles and models in osteopathic care: a clinical application of the integral theory, Altern. Ther. Health Med. 29 (5) (2023) 192–200.

[30] R.A. Macpherson, T.J. Lane, A. Collie, C.B. McLeod, Age, sex, and the changing disability burden of compensated work-related musculoskeletal disorders in Canada and Australia, BMC Public Health 18 (1) (2018) 758, https://doi.org/10.1186/s12889-018-5590-7.

[31] V. Malhotra, J. Harnett, E. McIntyre, A. Steel, K. Wong, B. Saini, The prevalence and characteristics of complementary medicine use by Australians living with sleep disorders – results of a cross-sectional study, Adv. Integr. Med. 7 (1) (2020) 14–22, https://doi.org/10.1016/j.aimed.2019.02.002.

[32] H. Meaklim, M.L. Jackson, D. Bartlett, B. Saini, K. Falloon, M. Junge, J. Slater, I. C. Rehm, L.J. Meltzer, Sleep education for healthcare providers: Addressing deficient sleep in Australia and New Zealand, Sleep. Health 6 (5) (2020) 636–650, https://doi.org/10.1016/j.sleh.2020.01.012.

[33] A.P. Metse, J.A. Bowman, Prevalence of self-reported suboptimal sleep in Australia and receipt of sleep care: results from the 2017 National Social Survey, Sleep. Health 6 (1) (2020) 100–109, https://doi.org/10.1016/j.sleh.2019.08.010.

[34] R. Misajon, J. Pallant, A.-M. Bliuc, Rasch analysis of the Personal Wellbeing Index, Qual. Life Res. 25 (10) (2016) 2565–2569, https://doi.org/10.1007/s11136-016-1302-x.

[35] P. Orrock, Profile of members of the Australian Osteopathic Association: Part 2 - The patients, Int. J. Osteopath. Med. 12 (4) (2009) 128–139, https://doi.org/10.1016/j.ijosm.2009.06.001.

[36] P.J. Orrock, The patient experience of osteopathic healthcare, Man. Ther. 22 (2016) 131–137, https://doi.org/10.1016/j.math.2015.11.003.
[37] A. Plunkett, C. Fawkes, D. Carnes, Osteopathic practice in the United Kingdom: a retrospective analysis of practice data, PLoS ONE 17 (7) (2022) e0270806, https://doi.org/10.1371/journal.pone.0270806.
[38] A. Salazar, M. Dueñas, J.A. Mico, B. Ojeda, L. Agüera-Ortiz, J.A. Cervilla, I. Failde, Undiagnosed mood disorders and sleep disturbances in primary care patients with chronic musculoskeletal pain, Pain. Med. 14 (9) (2013) 1416–1425, https://doi.org/10.1111/pme.12165.
[39] K.K. Sampath, B. Darlow, S. Tumilty, W. Shillito, M. Hanses, H. Devan, O. P. Thomson, Barriers and facilitators experienced by osteopaths in implementing a biopsychosocial (BPS) framework of care when managing people with musculoskeletal pain – a mixed methods systematic review, BMC Health Serv. Res. 21 (1) (2021) 695, https://doi.org/10.1186/s12913-021-06720-w.
[40] M. Santos, F.L. Gabani, S.M. de Andrade, B. Bizzozero-Peroni, V. Martínez-Vizcaíno, A.D. González, A.E. Mesas, The bidirectional association between chronic musculoskeletal pain and sleep-related problems: a systematic review and meta-analysis, Rheumatology 62 (9) (2023) 2951–2962, https://doi.org/10.1093/rheumatology/kead190.
[41] M. Siahpush, M. Spittal, G.K. Singh, Happiness and life satisfaction prospectively predict self-rated health, physical health, and the presence of limiting, long-term health conditions, Am. J. Health Promot. 23 (1) (2008) 18–26, https://doi.org/10.4278/ajhp.061023137.
[42] A. Steel, H. Foley, K. Graham, J. Harnett, J. Adams, Patient experiences of information-sharing and patient-centred care across the broad landscape of primary care practice and provision: a nationally representative survey of Australian adults, BMC Prim. Care 25 (1) (2024) 151, https://doi.org/10.1186/s12875-024-02359-8.
[43] A. Steel, B. Vaughan, P. Orrock, W. Peng, M. Fleischmann, S. Grace, R.M. Engel, D. Sibbritt, J. Adams, Prevalence and profile of Australian osteopaths treating older people, Complement. Ther. Med. 43 (2019) 125–130, https://doi.org/10.1016/j.ctim.2019.01.013.
[44] A.L. Stewart, R.D. Hays, J.E. Ware Jr., The MOS short-form general health survey: reliability and validity in a patient population, Med. Care 26 (7) (1988). ⟨https://journals.lww.com/lww-medicalcare/fulltext/1988/07000/the_mos_short_form_general_health_survey_.7.aspx⟩.
[45] F.T. Talty, M.E. Roberts, C. Dang, D.J. Clewley, M.E. Horn, Using a behavioral model to identify factors associated with choice of provider for neck and low back pain: a systematic review, Musculoskelet. Sci. Pract. 49 (2020) 102223, https://doi.org/10.1016/j.msksp.2020.102223.
[46] O.P. Thomson, N.J. Petty, A.P. Moore, Reconsidering the patient-centeredness of osteopathy, Int. J. Osteopath. Med. 16 (1) (2013) 25–32, https://doi.org/10.1016/j.ijosm.2012.03.001.
[47] J. Toloui-Wallace, R. Forbes, O. Thomson, N. Costa, Fluid Boundaries: Ethnographic observations of co-located physiotherapists, chiropractors, and osteopaths. [Pre-print], Res. Sq. (2023). ⟨https://www.researchsquare.com/article/rs-3638113/v1⟩.
[48] J. Toloui-Wallace, R. Forbes, O.P. Thomson, J. Setchell, When worlds collide: experiences of physiotherapists, chiropractors, and osteopaths working together, Musculoskelet. Sci. Pract. 60 (2022) 102564, https://doi.org/10.1016/j.msksp.2022.102564.
[49] B. Vaughan, K. Fitzgerald, M. Fleischmann, J. Mulcahy, Determinants of health, health behaviours and demographic profile of patients attending an Australian university student-led osteopathy clinic, Chiropr. Man. Ther. 28 (1) (2020) 2, https://doi.org/10.1186/s12998-019-0292-5.
[50] B. Vaughan, J. Mulcahy, T. Allen, E. Coupe, D. Gobbo, L. Nasser, K. Pain, K. Fitzgerald, Life satisfaction and musculoskeletal complaints in a population seeking osteopathy care: consecutive sample of 611 patients, Chiropr. Man. Ther. 28 (1) (2020) 14, https://doi.org/10.1186/s12998-020-00303-y.
[51] B. Vaughan, J. Mulcahy, K. Fitzgeral, Health literacy screening of patients attending a student-led osteopathy clinic: a pilot investigation, Complement. Ther. Clin. Pract. 24 (2016) 41–44, https://doi.org/10.1016/j.ctcp.2016.05.004.
[52] C.C.L. Xue, A.L. Zhang, V. Lin, R. Myers, B. Polus, D.F. Story, Acupuncture, chiropractic and osteopathy use in Australia: a national population survey, BMC Public Health 8 (1) (2008) 105, https://doi.org/10.1186/1471-2458-8-105.
[53] Yatani, K. (2016). Mann-Whitney's U test. Retrieved January 9, 2016, from ⟨http://yatani.jp/teaching/doku.php?id=hcistats:mannwhitney⟩.