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Osteopathic management of non-specific neck pain: Preliminary findings from a cross sectional study of Australian osteopaths

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ABSTRACT

Objective: Neck pain is a highly prevalent condition that leads to considerable pain and disability. There is an economic cost to neck pain at both a personal and broader health system level. Neck pain may be classified as 'non-specific' neck pain (NSNP) when there is an absence of identifiable underlying disease or abnormal anatomical structure. Osteopaths play a role in the management of NSNP, but it is unclear how osteopaths specifically manage this condition. This study explores what osteopaths do for patients with NSNP.

Methods: Cross sectional design. Via an online survey.

Results: All participants in this study reported applying soft tissue techniques, using exercise prescription, discussing physical activity levels, physical fitness, stress management, pain education and posture and ergonomics for patients with NSNP. Less than half of the osteopaths in this study reported using PROMs in clinical practice for the management of non-specific neck pain and only a small number completed continuing professional development (CPD) related to the clinical management of NSNP.

Conclusion: This study demonstrates Australian osteopaths use a range of manual therapy techniques and education strategies in clinical practice for the management of NSNP in line with clinical practice guidelines.

Implications for clinical practice:

- All osteopaths in this study reported applying soft tissue techniques, using exercise prescription, discussing physical activity levels, physical fitness, stress management, pain education and posture and ergonomics for patients with NSNP.
- Less than half of the osteopaths in this study reported using PROMs in clinical practice for the management of non-specific neck pain.
- Only a small number of Australian osteopaths completed continuing professional development (CPD) related to the clinical management of NSNP.

1. Clinical relevance

All osteopaths in this study reported applying soft tissue techniques, using exercise prescription, discussing physical activity levels, physical fitness, stress management, pain education and posture and ergonomics for patients with NSNP. Less than half of the osteopaths in this study reported using PROMs in clinical practice for the management of non-specific neck pain and only a small number completed continuing professional development (CPD) related to the clinical management of

NSNP.

2. Introduction

Neck pain is a highly prevalent condition that leads to considerable pain and disability. There is an economic cost to neck pain [1] at both a personal and broader health system level [2]. These costs are magnified when consideration is given to reduced productivity and occupation-related problems [3,4]. The prevalence of neck pain peaks in middle age, is higher in females and has a life-time incidence rate of

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Abbreviations

NSNP =	non-specific neck pain
MT =	manual therapy
PROM =	patient reported outcome measure
CPD =	continuing professional development
SMT =	spinal manipulative therapy
MET =	muscle energy technique
HVLA =	high velocity, low amplitude
BLT =	balanced ligamentous technique

12–70 % among the general population [4]. Neck pain is frequently associated with comorbidities including headache, back pain, arthralgia, and depression [4,5]. Individuals with neck pain often do not experience a complete resolution of symptoms, with 50–85 % reporting recurrence 1–5 years later [4,5]. Research into the burden of neck pain highlights decreased functional capacity, anxiety, worry and decreased quality of life [1].

Presentations may be classified as ‘nonspecific’ neck pain (NSNP) when there is an absence of identifiable underlying disease or abnormal anatomical structure [6]. A diagnosis of NSNP can be made on clinical grounds alone, provided there are no features suggestive of a more serious condition and/or a specific underlying disease causing the pain [7]. NSNP is related to limited cervical mobility, impaired function, myofascial pain syndromes, and stress at work [3,8,9]. NSNP is not just a clinical problem, it can develop into a complex disorder where physical, psychological, and social factors interact leading to maintained disability.

The most common treatments for neck pain include exercise therapy [10,11], stretching [12], and manual therapy [10,13–15]. Research suggests manual therapy may be effective for the management of NSNP, particularly for increasing range of motion and decreasing pain levels [16]. Spinal manipulative therapy (SMT) – typically joint mobilisation and massage - are manual therapy techniques [15] with moderate levels of evidence to support their effectiveness [17,18]. Reviews by Miller et al. [15] and Gross et al. [13] support the use of unimodal manual therapies in improving pain and function in the short and medium term, but highlight the absence of long-term data on multimodal techniques and the combined treatment effect of these techniques.

In Australia, osteopaths are primary healthcare professionals who typically use a range of manual therapy techniques, education strategies and exercise prescription for patients with musculoskeletal conditions [19–21]. Osteopaths practice within a biopsychosocial model of patient care [22], with the aim to manage neuro-musculoskeletal pain conditions and optimise both function and health [23]. For the management of neck pain, osteopaths may use techniques such as spinal manipulation and muscle energy technique and various massage techniques [19–21]. Fleischmann et al. [23] examined the self-reported treatment approaches of 971 Australian osteopaths who reported treating neck pain and found osteopaths with less than 10 years of clinical practice experience typically utilise muscle energy technique, myofascial release, dry needling, exercise prescription and shockwave therapy Fleischmann, McLaughlin et al. [23]. Australian osteopaths reported frequently discussing occupational health and safety concerns with their patients as part of their management of neck pain. Osteopaths with more than 10 years clinical practice experience are more likely to use soft tissue techniques (ST), osteopathy in the cranial field (OCF) and ultrasound (US) for patients with neck pain [23]. This increased likelihood of using soft tissue techniques could be associated with research demonstrating its effectiveness for neck pain [13,15] and aligns with clinical practice guidelines.

The choice of management strategies used by osteopaths may be informed by various clinical reasoning approaches, such as

hypotheticodeductive reasoning, pattern recognition and narrative reasoning (collaborative dialogue between the patient and practitioner) [24]. Thomson et al. [24] describes clinical reasoning as a continuum with technical rationality (a practitioner-centred, biomedical approach) on one end, and professional artistry (a patient-centred, biopsychosocial approach) on the other [24]. What treatment and management strategies osteopaths use for NSNP remains largely underexplored.

The current study aimed to identify the manual therapy techniques and management strategies Australian osteopaths use for the management of NSNP as part of broader work exploring osteopathic clinical reasoning.

3. Methods

3.1. Study design

For the current study, NSNP was defined as pain in the anatomic region limited cranially by the superior nuchal line, caudally by the first thoracic vertebra, and laterally by the trapezius muscle close to where it attaches to the shoulder joint [7].

This study employed a cross-sectional design. An online (Qualtrics™), 32-item survey instrument was developed by the primary author (Appendix 1). The survey was divided into two domains: demographic characteristics and clinical management characteristics. Questions developed in the Demographic domain were informed by an Australian osteopathy workforce survey (Adams et al. [19] and questions developed in the clinical management domain were informed by Fleischmann, McLaughlin et al. [23]. Face validity was evaluated with a group of practicing osteopaths and student osteopaths. Based on feedback, the survey was modified to improve clarity, remove ambiguity, and improve the sequencing of questions.

The survey landing page included the operational definition of nonspecific neck pain as defined by Bogduk [7] and the timeframe for what needs to be considered acute pain and chronic pain [25]. Accordingly, up to three months’ duration was acute and three months or more was considered chronic pain.

3.2. Participants

Potential participants in the study were recruited through Osteopathy Australia, the professional association for osteopaths in Australia. Osteopathy Australia had ~2500 members at the time of survey distribution (2021). The recruitment invitation pack for the current study was distributed via electronic flyers and was signposted in the opening page of the online survey. Participants were directed to the survey website via a link embedded in the flyer advertisement. Two reminders were posted to Osteopathy Australia social media platforms following distribution of the initial invitation pack approximately one week and two weeks later. The survey was available to complete for a total of 5 weeks.

Participants were invited to complete the online questionnaire in their own time. As well as their clinical management of patients with NSNP, participants were asked to provide details about their own demographic and practice characteristics.

3.2.1. Demographic characteristics included

Age; gender; highest level of osteopathy professional qualification; completed professional development; and length of time (in years) working in private osteopathy practice.

3.2.2. Practice characteristics

Included average patient care hours and patient visits per week; average consultations per week for patients with non-specific neck pain; practice location; and health professionals working in the same practice location.

3.2.3. Clinical management characteristics

Sub-patient groups (e.g., elderly; child etc); frequency of treatment (for acute and chronic NSNP); osteopathic techniques and various management strategies used; regions of the body treated; use of patient reported outcome measures; and type and frequency of osteopathy techniques used for the management of NSNP.

3.3. Statistical methods

Data were exported from Qualtrics, collated, and cleaned using Microsoft Excel and imported into SPSS (version 27.0) for analysis. Frequency distributions and percentages were used to describe categorical or ordinal data. The available response categories ('often', 'sometimes', 'rarely' and 'never') were used to remain consistent with previous work completed by Adams et al. [19], were ordinal and were converted into numerically weighted scales as per previous studies of the Australian osteopathic profession [23,26,27].

The sample size required in this study was 340, based on 95 % CI and a margin of error of 5 %. This would provide confidence to generalise the results to the wider osteopathic profession in Australia. However, given the small sample size (n = 49) achieved in this study, demographic statistics are presented with basic inferential statistic (independent t-test) to explore trends.

For summary reporting purposes, the combined percentage of responses in the 'sometimes' and 'often', and 'never' and 'rarely' were combined into one category respectively to present an easily understood percentage of use. Open-ended responses in the 'Other' category were tallied by grouping similar answers, for example, if a participant wrote 'myo' and another wrote 'myotherapist', this was considered to be two responses as myotherapist. Redundant or inappropriate responses were excluded. For example, if a participant inputted gibberish, it was deemed nonsensical.

Descriptive statistics were generated for each variable on the questionnaire. Inferential statistics were used to explore associations between the outcome variable and dichotomised variables to identify potential trends. The effect of gender on age; years in clinical practice; patient care visits per week; average hours per week and amount of patient care visits per patient diagnosed with NSNP, were analysed using independent samples t-test (p < 0.05) with 95 % confidence intervals and effect sizes calculated where relevant (Cohen's d). Reported Years in Practice was dichotomised, with those with 10 or less years of clinical practice experience placed into group 1 and participants with 11 or more years in clinical practice placed into group 2 [23]. The effect of the number of years in practice, the number of patient care visits per week, average hours per week and amount of patient care visits per patient diagnosed with NSNP, were analysed using an independent samples t-test with 95 % confidence intervals and effect sizes calculated where relevant (Cohen's d).

4. Results

4.1. Demographic characteristics of Australian osteopaths who reported treating non-specific neck pain

Table 1 (below) shows forty-nine (N = 49) osteopaths (29 females; 20 males) from the approximately 2500 invited participated in the survey, with the majority (69 %) of osteopaths reporting their main practice location as Victoria and four (8 %) osteopaths reporting their main practice location as New South Wales and Queensland, respectively. Thirty-seven (76 %) osteopaths reported their main practice location being in an urban setting, 10 (20 %) osteopaths reported working in a rural setting and two (4 %) respondents reported working in a remote setting. The average age of the respondents was 37 years, and the average clinical experience of these osteopaths was ~10 years. The number of average patient care hours per week was ~26 h per week, with ~33 patient consults per week.

Table 1
Demographic characteristics of Australian osteopaths who treat non-specific neck pain (NSNP).

Variable	Frequency (Missing)	Mean (SD)	Percentage (%)
N = 49			
Age	49 (0)	37.04 (8.07)	
Gender*	49 (0)		
Male	20		40
Female	29		60
Years as a Registered Osteopath*	49 (0)	10.1 (6.44)	
N = 49			
Age:			
Gender*:	49 (0)		
Male	20		40
Female:	29		60
	49 (0)	10.1 (6.44)	
Osteopaths with 0–10 years of clinical practice:	30		
Osteopaths with >11 years of clinical practice:	19		
Average Patient Care Hours Per Week*:	49 (0)	25.17 (9.85)	
Average Patient Consultations Per Week*:	48 (1)	33.13 (16.36)	
Highest Level of Osteopathic Qualification:	49 (0)		
Bachelor (or Double Bachelor) Degree	11		22
Master's Degree	35		72
Other	3		6
Main Practice Location:	49 (0)		
VIC	35		69
NSW	4		8
QLD	4		8
WA	3		6
TAS	2		4
SA,	1		2
Other	0		0
Professional Roles Outside of Clinic:	49 (0)		
Vocational/higher education teaching	11		22
Clinical Supervision	8		16
Research	7		14
Volunteer Work	8		16
Private Practice	49		96
Professional Organisation Activities	8		16
Completed Continuing Professional Development for NSNP	49 (0)		
Yes	9		18
No	40		82
Work with other healthcare provider at main practice location	49 (0)		
Yes	39		74
No	10		26
Frequency managing patients with nonspecific neck pain	48 (1)		
Never	0		0
Rarely	0		0
Sometimes	8		16
Often	40		82
Frequency managing patients with acute non-specific neck pain	48 (1)		
Never	0		0
Rarely	1		2
Sometimes	21		44
Often	26		54

(continued on next page)

Table 1 (continued)

Variable	Frequency (Missing)	Mean (SD)	Percentage (%)
Frequency managing patients with chronic non-specific neck pain	46 (3)		
Never	0		0
Rarely	2		4
Sometimes	14		29
Often	30		62

*Not statistically significant: independent t-test >0.05.

The majority of osteopaths (N = 35; 71 %) reported having a Master’s level qualification in osteopathy, whilst 11 (23 %) respondents reported having completed a Bachelor level osteopathic qualification, and three (6 %) respondents reported completing ‘other’ qualifications. Forty-nine respondents reported working in private practice, whilst 11 (22 %) respondents reported having a professional teaching role other than clinical supervision, whilst eight (16 %) respondents reported working in each of: clinical supervision; volunteer work and in professional organisation activities (e.g., professional osteopathic boards, committee), and seven (14 %) respondents reported working in research.

Almost three quarters (N = 39; 74 %) of respondents reported working with other healthcare providers in their main practice location. The most common healthcare professionals being co-located with the osteopaths were massage therapist (n = 24; 49 %) and 11 (22 %) reported working in the same location as an exercise physiologist; No respondents reported working with an occupational therapist or specialist medical practitioner.

When exploring if trends exist between the effect of gender on age and years in clinical practice and; patient care visits per week; average hours per week and amount of patient care visits per patient diagnosed with NSNP, these were found to be not statistically significant (P > 0.05).

Less than half of the osteopaths (n = 23, 43 %) who completed the survey reported they receive referrals or send referrals to a general practitioner for patients with NSNP. In contrast, only three (7 %) respondents reported receiving or sending patients with NSNP to a dietician or nutritionist as part of their multidisciplinary care, and 2 (5 %) respondents reported an acupuncturist were part of their referral network for patients with NSNP.

Table 1 (below) shows nearly all (N = 48; 98 %) respondents reported treating acute and chronic non-specific neck pain (NSNP), with

more visits reported per patient with chronic NSNP (mean = 11.6; SD = 7.6).

4.2. Patient demographics as reported by osteopaths who treat nonspecific neck pain

Fig. 1 below demonstrates most respondents (N = 37; 84 %) reported treating patients with NSNP aged between 18 and 65 years, and 38 (87 %) respondents reported treating patients with NSNP older than 65 years old. Thirty-four (77 %) respondents reported treating patients aged under 18 years of age with NSNP, and 21 (48 %) respondents reported treating patients with NSNP on a less frequent basis (i.e., ‘never’ or ‘rarely’). Fig. 1 also shows thirty-seven (84 %) respondents reported treating patients with NSNP with English as a second language. No respondents reported treating patients of other genders or from patients who report ‘they prefer to not say’.

Fig. 2 demonstrates forty-two (96 %) respondents reported patients were most frequently private paying patients. For patients who were not private paying patients, the most common compensable scheme in Australia was Chronic Disease Management plans (N = 38; 88 %) which are issued by general practitioners. These plans include a comprehensive care plan that is subsidised by Medicare and lists the patient’s health problems and goals, information about other healthcare professionals the patient is seeing, medication history including use/dosage, and information about community services the patient may use and/or need...

Most respondents (N = 42; 93 %) reported their patients have a comorbidity ‘sometimes’ or ‘often’ compared to two respondents who reported patients with non-specific neck pain ‘rarely’ have a comorbidity (see Supplementary File 1).

4.3. Clinical management approaches used by osteopaths for NSNP

Fig. 3 below demonstrates most respondents reported using exercise prescription (N = 42; 98 %), and soft tissue techniques (N = 41; 95 %) ‘sometimes’ or ‘often’ for patients with non-specific neck pain (NSNP) and almost three quarters of respondents (N = 33) reported using high velocity, low amplitude technique (HVLA) ‘sometimes’ or ‘often’ for patients NSNP. Seven (16 %) respondents reported using visceral techniques and biodynamic techniques in their clinical management for patients with NSNP. Autonomic balancing techniques and osteopathy in the cranial field were the two least frequently used techniques, with twelve (28 %) respondents reporting using autonomic balancing techniques, and 14 (33 %) respondents reported using osteopathy in the

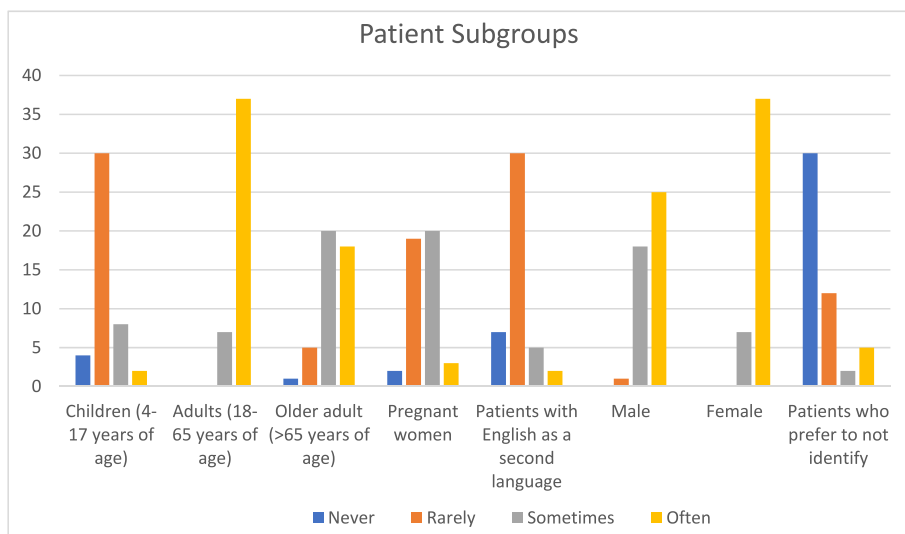


Fig. 1. Patient demographics (subgroups): age group, gender, pregnant women, and English as a second language (ESL).

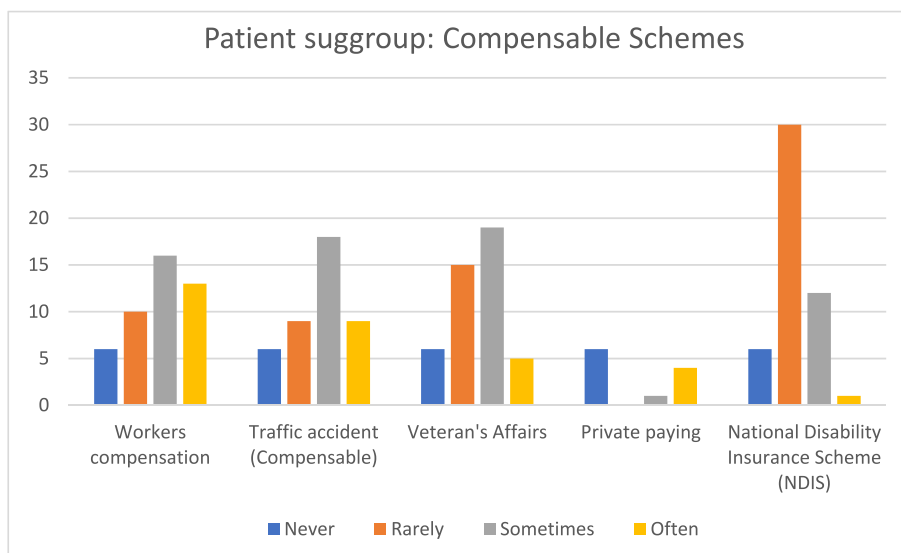


Fig. 2. Patient demographics: Compensable schemes.

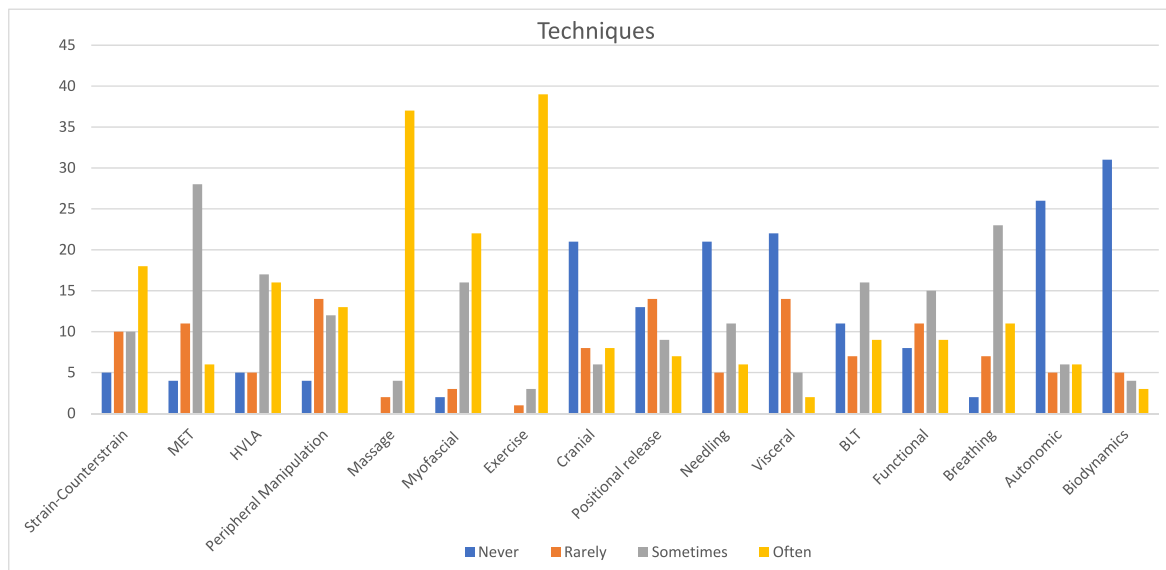


Fig. 3. Frequency of techniques used by osteopaths who treat patients with non-specific neck pain (NSNP). ^ MET = muscle energy technique; HVLA = high velocity, low amplitude; BLT = balanced ligamentous technique.

cranial field for patients with NSNP.

With respect to non-manual therapy approaches, all respondents (N = 43) reported discussing physical activity levels, physical fitness, stress management, pain education and posture and ergonomics for patients with NSNP (see Supplementary file 1). More than half (N = 22; 51 %) of the respondents reporting discussing diet/nutrition and smoking/drugs with patients with NSNP (see Supplementary file 1).

Regarding the regions reported by respondents when treating patients with NSNP, Fig. 4 (above) shows 43 respondents reported treating the shoulder and the thoracic spine/ribs; 40 respondents reported treating the temporomandibular joint; and 38 (88 %) reported treating the head for patients with NSNP. Compared to 24 (55 %) respondents reporting treating the elbow; 17 (40 %) pelvis/sacroiliac joint; 16 (37 %) for the wrist and abdomen and 9 (21 %) for the viscera for patients with non-specific neck pain.

Most respondents reported (N = 40; 91 %) performing orthopaedic tests for patients with NSNP including Spurling's (N = 26; 59 %), followed by 39 (89 %) respondents reporting they perform a neurological

exam for a patient with NSNP (See supplementary file 1). Thirty (69 %) respondents reported performing a balance or coordination exam and 27 (61 %) respondents reported performing a cranial nerve exam less frequently for patients with NSNP.

Fig. 5 above demonstrates less than half (N = 21; 43 %) of respondents reported using patient reported outcome measures (PROMs) for patients with non-specific neck pain. Of the 21 respondents, 17 (81 %) reported using the Neck Disability Index and 15 (71 %) reported using the Patient Specific Functional Scale (N = 15). Two osteopaths reported using visual analogue scale and Whiplash Disorder questionnaire after selecting 'other'.

5. Discussion

Most osteopaths in the current study (98 %) reported treating neck pain 'sometimes' or 'often' in their clinical practice and use a range of manual therapy techniques and education strategies for the management of NSNP. Australian osteopaths in the current work reported using

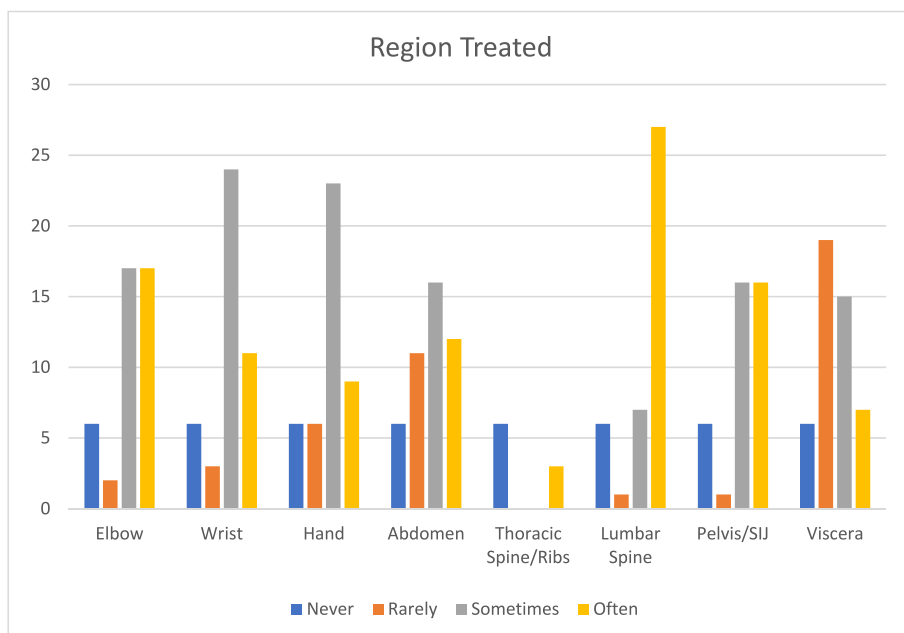


Fig. 4. Frequency of region treated by osteopaths who treat non-specific neck pain.

^ SIJ = sacroiliac joint.

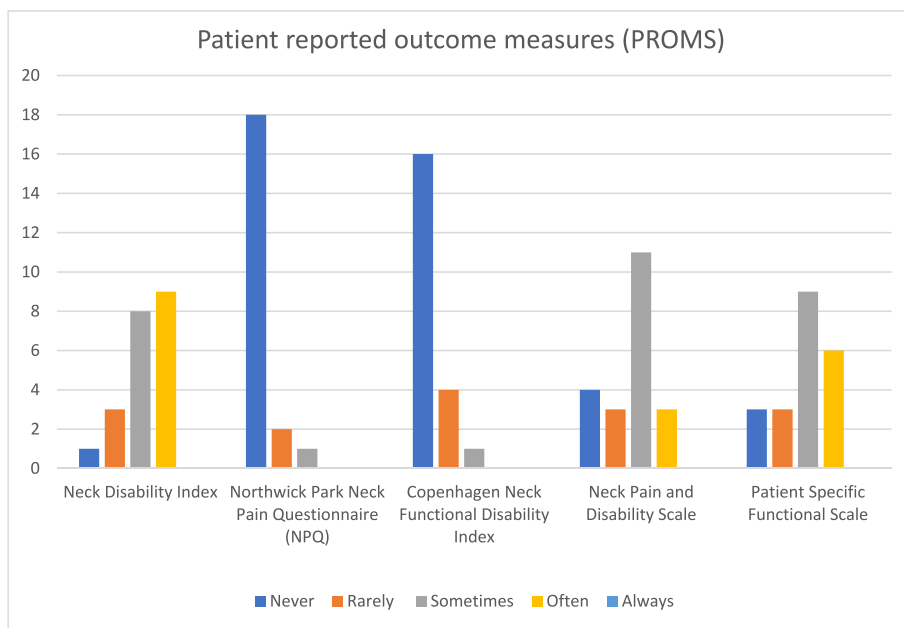


Fig. 5. Frequency of use of patient reported outcome measures by osteopaths who treat nonspecific neck pain.

multiple manual therapy (MT) techniques and other management strategies for the management of NSNP, consistent with previous research exploring characteristics of Australian osteopathic practice [19–21]. Specifically, all osteopaths in the current study reported applying soft tissue techniques and using exercise prescription in the management of NSNP patients, both of which have been shown to provide moderate effectiveness for patient outcomes [13,15,17,28].

The frequency of manual therapy techniques used for patients with NSNP by respondents reported in this study is in line with clinical practice guidelines [15,17]. These guidelines suggest the use of exercise prescription, massage therapy and spinal manipulation for acute neck pain as being moderately effective. It would be of interest to explore how these osteopaths use these techniques, and explore their clinical decision

making for patients with NSNP when considering technique type and application. Further, it would be valuable to explore if technique type varies dependent on chronicity of the patient’s NSNP and years in clinical practice. Work by Fleischmann, McLaughlin et al. [23] identified that manual therapy technique choice differs between those with less than 10 years of clinical practice experience compared to osteopaths with 10 or more years of clinical practice experience.

All respondent osteopaths reported discussing physical activity levels, physical fitness, stress management, pain education, and posture and ergonomics for patients with NSNP. These management approaches are also consistent with clinical practice guidelines for care of neck pain [29].

Osteopaths in the current work reported applying manual therapy

techniques to the head, temporomandibular joints, thoracic spine/ribs, and shoulder girdle when treating patients with NSNP. This finding is consistent with other research showing osteopaths target multiple tissues [8] because of the nonspecific nature of the condition [7] and clinical decision-making in osteopathy occurs with varying levels of patient involvement and is related to practitioners' therapeutic approach [24]. More research needs to be conducted exploring why osteopaths choose to treat certain tissues over others and what factors guide their clinical reasoning to determine the most effective osteopathic management for NSNP. Further, it would be valuable to ask osteopaths to report on their management of patients with NSNP when considering patients with either acute or chronic NSNP. Specifically, exploring whether osteopaths apply different examination procedures, treatment techniques and other management approaches.

Of the 27 (55 %) respondents who reported working within a multidisciplinary clinic, 23 (85 %) osteopaths reported working with a general practitioner (GP). Research highlights patients with NSNP have the most success when co-managed by multiple health professionals including GPs and those who perform manual therapy [30]. It would be valuable to further explore how these osteopaths utilise a general practitioner (GP) to assist with the management of patients with NSNP within a multidisciplinary approach. Researchers have explored the perceptions of osteopathy and referral patterns among health professionals previously. Cohen et al. [31] reported that general practitioners (GPs) did not consider the education of complementary therapy practitioners, including osteopaths, to be sufficient for the level of health care they offered. However, work by Wardle et al. [32] reported that GPs in rural Australia appear to have different attitudes towards complementary therapy practitioners than their colleagues in urban regions, with osteopaths in rural areas reportedly receiving a high rate of referral from GPs [32]. In these works Wardle et al. [32] argue this is because GPs have limited referral options in rural areas and need to use resources that are accessible.

Further research could explore the relationship between the GP and osteopath for the management of patients with NSNP to better understand the referral relationship and explore if it is in fact unilateral care or true co-management.

Nine (18 %) osteopaths reported completing continuing professional development (CPD) in the clinical management of nonspecific neck pain over the previous 12 months. Given research has shown neck pain is a frequent patient presentation to osteopaths [19,20,33] qualitative research should be conducted to identify what barriers and enablers exist for osteopaths to complete CPD in this area, including an exploration of osteopaths' decision making when choosing which CPD to complete. A needs-based analysis could be completed to determine if osteopaths need CPD in the management of neck pain. This would be of use in determining whether there was a difference between what the profession was undertaking for CPD, and those CPD activities which are more closely aligned to improved practice and patient outcomes. Exploring opportunities for CPD which focusses on literature/clinical decision making for patients with acute versus chronic pain would also be of benefit to decrease the possibility of pain developing into persistent or chronic pain.

The low number of osteopaths who reported completing CPD in this study may be because individual attitudes amongst healthcare professionals towards CPD can be affected by several factors including lack of available time, lack of motivation and occupational fatigue [34]. Given the small number, and the established benefits of completing professional development for allied health professionals [35], professional associations should strive to encourage engagement, while recognising the different drivers within different types of employment and at different career points of osteopaths.

In the current study, less than half (21; 43 %) of the osteopaths reported using PROMs for patients with NSNP, with the Neck Disability Index being the most frequently used tool. The use of PROMs in clinical practice is important to measure change in the patients' presentation

over time [36] with respect to activities of daily living, functional capacity and pain [37–40]. Research studies using qualitative designs could explore the barriers and facilitators to the use of PROMs in osteopathic clinical practice (not just for NSNP) to increase their utilisation given research highlights the benefit of using PROMs in patient care [41, 42]. Continuing professional development (CPD) emphasising the importance of PROMs could target training osteopaths to use them regularly to track patient progress on health status, quality of life, disability and function.

Previous work by Fleischmann et al. highlighted technique choice for patients with neck pain may change commensurate with years in practice, with those in practice more than 10 years choosing to use less exercise prescription and more 'hands on manual' therapy [23]. In the current work, years in clinical practice was not associated with the volume of patient consults per week and the number of consults provided for acute and chronic NSNP. However, the small sample size and the cross-sectional and self-report nature of the design of the survey is a limitation when interpreting the results of the study.

5.1. Limitations

Cross-sectional self-report designs are potentially susceptible to social desirability bias [43] and recall bias [44]. Further work needs to establish whether there are clinically relevant differences of technique choice for those with more than 10 years of clinical practice versus those with 10 years or less, and what reasoning factors may be associated with these technique and management strategies.

Another limitation of this study is the timing of the data collection and the change in the number of osteopaths who now are part of the profession. Data collection took place in mid-late 2020 and it is possible the practice profile and characteristics have since changed due to the increase in the number of registered osteopaths, including the implementation of telehealth for healthcare professionals because of the COVID-19 pandemic [45].

Research needs to explore what techniques are applied to each region as part of osteopathic clinical decision-making and how these influence patient outcomes. Specifically, asking osteopaths why they choose certain techniques and strategies when managing patients with non-specific neck pain is of clinical significance. Whether osteopaths choose certain techniques and management strategies based on examination findings from orthopaedic tests and hypothetical deductive reasoning or from pattern recognition from diagnostic palpation, motion testing and case history is of interest as this may provide some insight into the clinical decision-making process of osteopaths and its similarities.

6. Conclusion

This study provides an insight into practitioner demographics and the clinical characteristics of Australian osteopaths who reported treating non-specific neck pain (NSNP). Australian osteopaths use a range of manual therapy techniques and education strategies in clinical practice for the management of NSNP in line with clinical practice guidelines. All osteopaths in this study reported applying soft tissue techniques, using exercise prescription, discussing physical activity levels, physical fitness, stress management, pain education and posture and ergonomics for patients with NSNP. Less than half of the osteopaths in this study reported using PROMs in clinical practice for the management of non-specific neck pain and only a small number completed continuing professional development (CPD) related to the clinical management of NSNP. Why osteopaths choose certain techniques and management strategies as well as why osteopaths choose to not use PROMs for the management of NSNP, needs further exploration. Mixed methods research - using a range of study designs to ensure a deep exploration of clinical decision-making processes and clinical reasoning strategies - is strongly recommended.

Ethical approval

Ethics approval was granted by Victoria University (HRE20-112).

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Author contribution statement

MF conceived the idea for the study and confirmed the most appropriate design for the study. MF, BV, AH and PM designed the survey instrument. MF led the distribution of the survey instrument and performed data analysis. All authors contributed to the interpretation of the data once data collection was completed. All authors contributed to the development of the manuscript and approved the final version.

Declaration of competing interest

All authors declare there are no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijosm.2023.100706>.

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