



Original Article

Patient satisfaction and perception of treatment in a student-led osteopathy teaching clinic: Evaluating questionnaire dimensionality and internal structure, and outcomes



Brett Vaughan^{a,b,*}, Catherine Burns^a, Lauren Burridge^a, Jerome Wigger^a, Simon Blair^a, Jane Mulcahy^a

^a College of Health & Biomedicine, Victoria University, Melbourne, Australia

^b Institute of Sport, Exercise and Active Living, Victoria University, Melbourne, Australia

A B S T R A C T

Objective: The aim of the study was to evaluate patient satisfaction with, and perception of their, osteopathy treatment. A secondary aim was to evaluate the measurement properties of a short patient satisfaction questionnaire in an osteopathy patient population.

Design: Questionnaire study. Patients completed a brief demographic questionnaire, patient satisfaction questionnaire and perception of treatment questionnaire at the conclusion of their osteopathy consultation.

Setting: Osteopathy student-led teaching clinic (Melbourne, Australia).

Main outcome measures: Two questionnaires: 1) Short Assessment of Patient Satisfaction (SAPS); and, 2) the Patient Perception Measure – Osteopathy (PPM-O).

Results: Complete data were available for 68 patients. Mean age was 36 years and over half were female. Participants' median satisfaction with life (SWL) was 4 on a 0–5 scale. The SAPS did not satisfy the requirements of a Mokken scale nor was it unidimensional in this population. The reliability estimations for the PPM-O subscales were acceptable (> 0.80). Both age and SWL were positively correlated with effect of treatment as measured on the SAPS. Age, gender and previous osteopathy treatment did not relate to SAPS responses. The PPM-O Education and Effectiveness subscale was positively correlated with the SAPS items related to treatment effect, appointment duration and overall satisfaction with care.

Conclusions: Patients in the present study were largely satisfied with treatment and positive about their perception of the osteopathy treatment provided. Further testing of the SAPS to evaluate if it is suitable for use as a measure of satisfaction with osteopathy care or testing of an alternative measure is required.

1. Introduction

Patient satisfaction is a multi-faceted [1] and complex phenomenon that is not readily defined [2] but is considered to be a measure of both treatment outcome and provision of care [3]. Although not readily defined, authors have identified determinants of the patient experience that contribute to their satisfaction with care. Communication and interpersonal skills [1,2,4–8], practical skills of the clinician [4,5], individualised nature of the care provided [1,4,9,10], continuity of care [5,11] and the physical and organisational environment [4–6] have all been identified as determinants of patient satisfaction. Demographic variables may also be related to patient satisfaction however the only consistent finding is that older patients are generally more satisfied with their care [5,10,12]. The effect of gender on satisfaction is inconsistent [5,13], as are other variables such as education level, marital status, and religion [13]. Further, the patients' psychosocial situation

may also be a determinant, where those with mental health conditions and lower self-rated general health demonstrate lower satisfaction [3,5]. Batbaatar et al. [5] in their systematic review of the patient satisfaction literature suggest that “self-assessed health status was one of the strongest predictors of patient satisfaction” (p. 96). With respect to the presenting complaint, Hill and Kitchen [14] identified that patients with acute musculoskeletal complaints were more likely to be satisfied with their physical therapy care compared to those with chronic complaints. Patient satisfaction appears to be independent of the health practitioners' respective profession [3] however practitioners who are older and male appear to have higher satisfaction scores with both male and female patients [12].

The measurement of patient satisfaction may provide an opportunity to capture another element of treatment outcome. Patient satisfaction is directly associated with improved outcomes, adherence to management strategies [15] and maintenance of a therapeutic

* Corresponding author. Department of Medical Education, University of Melbourne, Level 7 North, Medical Building, Grattan Street, Parkville, Victoria, 3010, Australia.

E-mail address: brett.vaughan@unimelb.edu.au (B. Vaughan).

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relationship with a health professional [3] and with the shift in healthcare toward a patient-centred approach [9], it may be that patient satisfaction is a measure of this patient-centred care approach [1]. Previous studies have explored the patient experience of osteopathic healthcare in private practice in Australia [9] and the UK [16,17], and teaching clinics in the UK [2]. Several common themes have emerged in this research including the value of the therapeutic relationship and communication, holistic treatment and patient-centred management. These themes appear to be somewhat consistent with the wider patient satisfaction literature. Tied with these themes is the concept of the patient's perception of their treatment. Previous work in osteopathy has explored the patient's perception of their treatment, including sensations felt during or after treatment [18–20]. Perception also incorporates the quality of care, and the comparison between what the patient expected and what they experienced [21]. DiGiacinto et al. [19] suggested that low perception of care quality can significantly affect overall satisfaction with care however this has yet to be explored in osteopathy.

To date, no studies have investigated both patient satisfaction and perception of osteopathy in a student clinic in Australia. Victoria University (VU, Melbourne, Australia) operates a campus-based osteopathy clinic to provide pre-clinical students an opportunity to develop their skills and knowledge to manage patients in a clinical setting. In these clinics, students practise under the supervision of qualified practitioners for between 5 and 10 h per week for up to 34 weeks each year [22]. This setting is somewhat similar to student-led clinics in medicine and physiotherapy where high patient satisfaction has been reported, particularly the amount of time spent with a patient, and interpersonal aspects of care [23–26]. Further the presence of medical students does not appear to impact patient satisfaction [27–30]. The current study explored the relationship between satisfaction with osteopathic treatment and perception of osteopathic treatment in an Australian student-led osteopathy teaching clinic. Further aims were to explore a potential link between perception and satisfaction with treatment, and demographic data, and the measurement properties of the questionnaires used.

2. Methodology

2.1. Participants

Participants were recruited from the Victoria University (VU) Osteopathy Clinic (Melbourne, Australia). Each participant was required to have at least one osteopathic treatment from a senior osteopathy student and have sufficient English to complete the questionnaires. The study was approved by the Victoria University Human Research Ethics Committee. Potential participants who attended the clinic between March 2016 and August 2016, regardless of presenting complaint, or whether they were a new or return patient, were invited to complete the questionnaires at the conclusion of their treatment. The junior osteopathy students who were performing reception duties were asked to invite each patient to complete the questionnaire. Participants were encouraged to complete the questionnaire immediately after their treatment, however they did have the option of posting the completed questionnaires back to the researchers. Potential participants were only required to complete the questionnaires on one occasion post-osteopathic treatment.

2.2. Study design

Data were collected via a three-part document: part 1 was a brief demographic questionnaire including gender and age, previous attendance at the clinic, past osteopathic treatment and the reason for treatment. The participant self-reported their satisfaction with life [31] on a scale of 0–5; part 2 utilised the Short Assessment of Patient Satisfaction (SAPS) [32]; and part 3, the Patient Perception Measure –

Osteopathy (PPM-O) [18,33]. Both the SAPS and PPM-O questionnaires were rescored according to the authors' instructions prior to analysis.

The SAPS is a 7-item questionnaire developed by Hawthorne et al. [32] as a short measure of patient satisfaction. This questionnaire was chosen due to its reported measurement properties and its short administration time. The measure was developed based on commonly accepted domains of patient satisfaction and tested with patients experiencing incontinence. Data presented by Hawthorne [32] suggest the scale is unidimensional and has an acceptable internal structure (Cronbach's alpha (α) = 0.86). Items 2, 3, 5, 6 and 7 were amended to replace 'doctor/other health professional' with 'student osteopath'. The Patient Perception Measure – Osteopathy (PPM-O) was developed by Mulcahy and Vaughan [18] to evaluate a patient's perception of their osteopathy treatment. The PPM-O is a 13-item, two-subscale questionnaire. The subscales are Education & Effectiveness (9 items) and Cognition & Fatigue (6 items) with each subscale being demonstrated to be unidimensional using Rasch analysis. The questionnaire was administered once, following a consultation. An Information to Participants sheet was provided to each potential participant. Patients were asked to place completed questionnaires in a locked box in the clinic reception area. Only the lead researcher had access to the locked box.

2.3. Statistical analysis

Data were entered into SPSS version 22 (IBM Corp, USA). The SAPS and PPM-O scored as per the respective authors' instructions. A total for each of the two PPM-O subscales was also calculated. Descriptive statistics were generated for each of the SAPS, PPM-O items and PPM-O subscale scores in addition to the demographic data. Nonparametric statistics were used as the questionnaire data were both ordinal and categorical. Mann-Whitney and Kruskal-Wallis tests were used to explore the differences for gender, previous treatment and previous attendance at the VU Osteopathy Clinic. Spearman's *rho* (ρ) was used to evaluate the relationship between the SAPS items, PPM-O subscale scores, age and satisfaction with life (SWL). *Rho* (ρ) was interpreted as per Hopkins [34]: 0.0–0.1 (trivial); 0.1–0.3 (small); 0.3–0.5 (moderate); 0.5–0.7 (large); 0.7–0.9 (very large); 0.9–1 (almost perfect).

Data were exported to R for the calculation of the reliability estimations (internal consistency) and Mokken scale analysis (MSA) of the SAPS using the *mokken* [35] package. Mokken scale analysis [36] is a non-parametric item response theory (IRT) that places less strict assumptions on the fit of the data to the model when compared to parametric IRT approaches [37–39]. MSA can be used to evaluate dichotomous and polytomous data [37] and is used to evaluate the dimensionality and internal structure of a questionnaire (structural validity). Mokken scaling is based on three assumptions: 1) unidimensionality (measuring one underlying construct); 2) monotonicity (the chance of selecting the correct response or a higher response should be reflected by the level of the underlying construct); and, 3) local independence (the response to an item should be independent of the response to all other items) [39]. A fourth assumption is included for ordinal data - non-intersecting item characteristic curves [39]. Meeting these four assumptions provides evidence that the total score for the questionnaire can represent the construct being measured.

The MSA of the SAPS was undertaken using the steps described by Stochl et al. [39] and Van Der Ark [35] and are outlined here. Initially the automated item search function (*aisp*) is used to identify potential Mokken scales [40]. The SAPS items were analysed using an initial cut off of 0.3 and then reanalysed using increasing cutoffs in 0.05 steps until each Mokken scale could not be logically explained [40]. Using each scale identified as described, scalability coefficients and the standard error [41] were generated for the scale as a whole (H), the individual items (H_i), and each pair of items (H_{ij}). A scale is said to be 'weak' if H is less than 0.3, 'moderate' if H is between 0.4 and 0.5, and 'strong' if H is greater than 0.5. Items are thought to be suitable for inclusion in a Mokken scale if they demonstrate a H_i value greater than

0.3, and the *Hij* value is greater than 0. Local dependence identifies if the response to one item is systematically associated with a response to another item. If local independence is identified item the item with the lower *Hi* value is removed and the data reanalysed. The monotonicity assumption was analysed using a graphical and numerical. Completed scales were then analysed with Mokken's *rho* as one of the reliability estimations - values over 0.7 are acceptable [42].

McDonald's omega [43–45] and Cronbach's alpha were calculated as the reliability estimations (internal consistency) [46]. Authors have suggested that Cronbach's alpha may not be appropriate for use as a reliability estimation given data often do not meet the tau-equivalency assumption for the calculation of this statistic [43,47]. McDonald's omega has been suggested as a more appropriate estimation [47] and produces two statistics – omega total and omega hierarchical. Omega total is interpreted in the same way as Cronbach's alpha, and omega hierarchical values greater than 0.50 support the calculation of a total score for a scale [48]. Both reliability estimations were calculated using the *psych* package [49] in R. McDonald's omega and Cronbach's alpha were calculated for the SAPS and two PPM-O subscales respectively.

3. Results

Four thousand and four hundred patient visits occurred at the VU Osteopathy Clinic during the data collection period with 105 questionnaires being distributed (2.3%). Seventy-nine (*n* = 79) questionnaires were returned with complete data available for 68 patients representing a 1.5% response rate. Demographic data for these patients is presented in Table 1 and Fig. 1 respectively. Descriptive statistics for the SAPS and PPM-O are presented in Table 2.

Reliability estimations and Mokken coefficients

Reliability estimations for the SAPS were at an acceptable level for McDonald's omega total (0.71) but below an acceptable level for Cronbach's alpha (0.58), McDonald's omega hierarchal (0.27) and Mokken's *rho* (0.31). For the PPM-O Education and Effectiveness subscale, McDonald's omega total (0.88), McDonald's omega hierarchal (0.60) and Cronbach's alpha (0.82) were all acceptable. The PPM-O Cognition and Emotion subscale estimations were also acceptable, with McDonald's omega total (0.87), McDonald's omega hierarchal (0.77) and Cronbach's alpha (0.81). Mokken item coefficients for the SAPS are presented in Table 3. The Loevinger coefficient (*H*) was 0.11 in the current study compared to 0.55 in the Hawthorne et al. [32] study. *H* values between 0.3 and 0.4 suggest the items form a 'weak' scale, 0.4–0.5 suggest a 'medium' strength scale and greater than 0.5 are considered 'strong' [39].

Demographics, SAPS and the Patient Perception Measure – osteopathy

As the SAPS was not unidimensional in the current patient cohort, analysis of the relationship between the individual SAPS items and

Table 1
Demographic profile of osteopathy patients completing the study.

Demographic	
Age (mean ± SD)	36 years (± 15.6 years)
Gender	
Male	33 (41.8%)
Female	46 (58.2%)
Have you previously attended the VU Osteopathy Clinic?	
Yes	52 (65.8%)
No	27 (34.2%)
Have you previously had osteopathic treatment?	
Yes	61 (77.2%)
No	18 (22.8%)
Satisfaction with life (median & range)	4 (range 1–5)

demographics was undertaken. Small to moderate correlations were observed for age and SAPS item 1 ($\rho = 0.24$), and SAPS item 5 ($\rho = -0.27$), with a moderate positive correlation observed between SWL and SAPS item 1 ($\rho = 0.31$). Small correlations were observed for duration of osteopathic treatment and SAPS item 3 ($\rho = -0.28$), SAPS item 5 ($\rho = -0.25$) and SAPS item 7 ($\rho = 0.28$). All other correlations were $\rho \leq 0.20$. There were no significant differences observed in SAPS item scores for gender ($p > 0.05$), previous treatment at the VU Osteopathy Clinic ($p > 0.05$), or having previously had osteopathic treatment ($p > 0.05$).

Trivial correlations were observed for the PPM-O subscales and age ($\rho < 0.1$), SWL ($\rho < 0.1$), and duration of receiving osteopathic treatment ($\rho < 0.1$). There were no significant differences for gender ($p > 0.05$), previous treatment at the VU Osteopathy Clinic ($p > 0.05$), having previously had osteopathic treatment ($p > 0.05$), or the region of the presenting complaint ($p > 0.05$).

Relationship between the SAPS and Patient Perception Measure – osteopathy

The associations between the individual SAPS items and PPM-O subscales are presented in Table 4.

4. Discussion

This study aimed to explore the relationship between satisfaction with osteopathic treatment and patient perception of osteopathic treatment in an Australian student-led osteopathy clinic. Two questionnaires were used to explore this relationship. This study has highlighted several areas where osteopathy students may need to change their care strategies and approaches to improve patient satisfaction. The demographic data suggest that the patient profile in the present study is consistent with Australian private osteopathic practices. Data from studies in 2009 and 2013 [50,51] found that a typical Australian osteopathy patient is female (62.5% and 55.6% respectively) and aged 30–39 (23.25% and 44.4% respectively). This is consistent with the current study's profile with regard to gender (58.2% female) and age (mean 36, SD 15.6 years). The most common regions of treatment in this study were cervical spine, lumbar spine and knee. This is similar to recent data suggesting Australian osteopaths mostly manage cervical spine, lumbar spine, pelvis and lower limb complaints [51].

4.1. Patient satisfaction with osteopathy care

A significant difference between reliability data for the SAPS in the present study compared to the original study [32] was identified. Although the SAPS measure was developed to be a general measure of patient satisfaction in health care, the study was validated with a medical population experiencing incontinence rather than an osteopathy patient population [32]. The poor reliability estimations and Mokken scaling may indicate the SAPS measure may not be a valid tool to evaluate patient satisfaction for all health care modalities, including manual therapy. The difference between the current study and that by Hawthorne [32] could be related to the differences in populations studied (e.g. complaint, age), the intervention provided (manual therapy versus incontinence advice and support), and potentially the smaller sample size (68 (current study) versus 178) leading to less stable Mokken scaling estimates. This questionnaire will require further testing with larger patient cohorts if it is to be implemented in the student-led osteopathy clinic environment.

Given the limited support for the internal structure, dimensionality and reliability of the SAPS with patients receiving osteopathy care, the demographic variables were evaluated using each individual SAPS item. Gender, previous treatment at VU Osteopathy Clinic and previous osteopathic treatment had no influence on any of the SAPS items. However, there was a moderate positive relationship found between SWL and satisfaction with treatment (SAPS item 1, $\rho = 0.31$). Lower

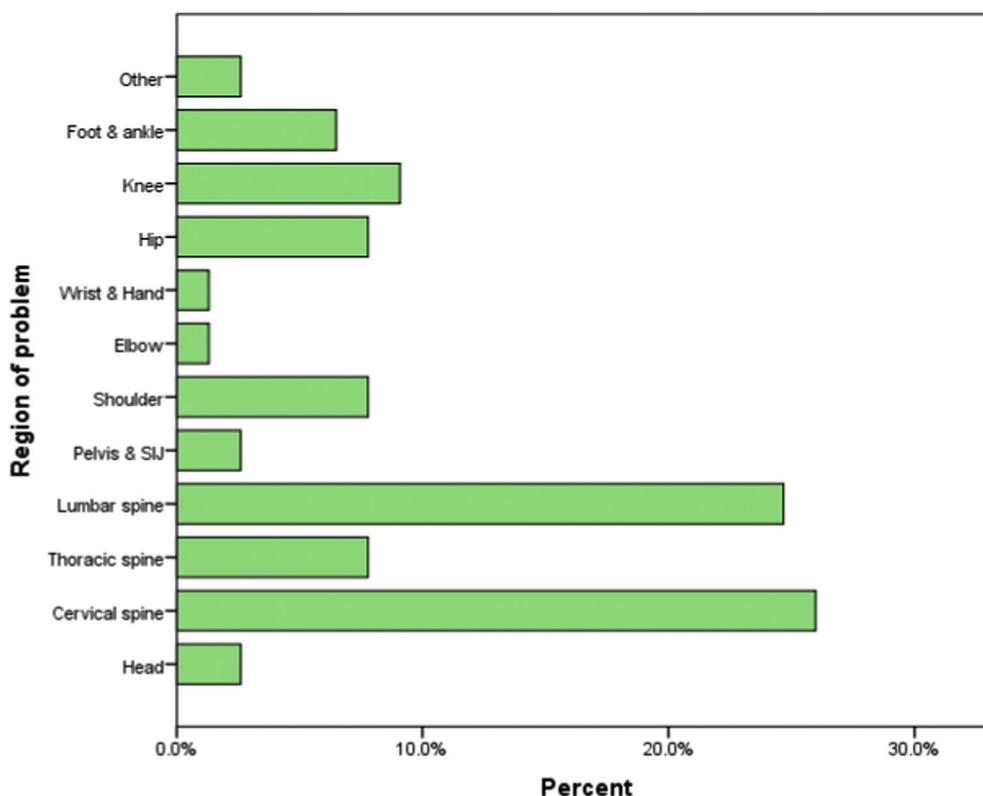


Fig. 1. Region of presenting complaint for patients completing the study.

SWL has been linked with depression (or the risk of developing depression) [52,53], and the presence of depression has been associated with lower patient satisfaction [3,5]. Therefore, measuring SWL may provide an indication as to whether the patient is more or less likely to be satisfied with the effect of their osteopathy treatment.

A positive correlation was observed between age and satisfaction with the effect of treatment (SAPS item 1, $\rho = 0.24$). This association has been described with respect to medical care [5,54] but infrequently documented in manual therapy literature with outcomes reported as

either a positive correlation [3] or no association [55]. Despite an increase in treatment satisfaction associated with advancing age, there was a small to moderate correlation between increasing age and a decreased sense of respect (SAPS item 5, $\rho = -0.27$). Developing a patient-practitioner relationship may be negatively impacted by the age difference between the predominately younger student practitioner population and an older patient, as occurred in the present study, however this is purely speculative. It may also be that as the study was undertaken in a teaching clinic environment, the treating students may

Table 2

Item descriptive statistics for the Short Assessment of Patient Satisfaction (SAPS) and the Patient Perception Measure – Osteopathy (PPM-O).

SAPS Items	Mean	St Dev	Median	Range
SAPS 1. How satisfied are you with the effect of your treatment?	3.56	0.55	4	2–4
SAPS 2. How satisfied are you with the explanations the student osteopath has given you about the results of your treatment?	2.57	1.68	3	0–4
SAPS 3. The student osteopath was very careful to check everything when examining you.	3.84	0.37	4	3–4
SAPS 4. How satisfied were you with the choices you had in decisions affecting your health care?	2.78	1.50	3	0–4
SAPS 5. How much of the time did you feel respected by the student osteopath?	3.97	0.17	4	3–4
SAPS 6. The time you had with the student osteopath was too short.	2.87	0.87	3	1–4
SAPS 7. Are you satisfied with the care you received in the clinic?	3.74	0.47	4	2–4
PPM-O Items				
PPM-O 1. The way my osteopath answers all of my questions is	3.55	0.56		2–4
PPM-O 2. The instructions my osteopath gives me regarding my home exercise program are	3.37	0.77		1–4
PPM-O 3. Osteopathic treatment has helped my condition	3.28	0.64		2–4
PPM-O 4. As a result of my osteopathic treatment, my general health is	3.66	0.75		2–5
PPM-O 5. During my treatment, the questions my osteopath asked were	3.39	0.60		2–4
PPM-O 6. After my osteopathic treatment I felt like my whole body was treated rather than just one area	4.12	0.83		2–5
PPM-O 7. Osteopaths at this clinic talk to me about the body's ability to heal itself	2.74	0.99		1–4
PPM-O 8. Osteopathic treatment makes me feel vague	4.22	0.84		2–5
PPM-O 9. I cannot focus on tasks after osteopathic treatment	3.31	0.90		1–4
PPM-O 10. I feel calmer after my osteopathic treatment	3.19	0.70		2–4
PPM-O 11. How helpful is osteopathic treatment in managing your condition?	4.15	0.83		1–5
PPM-O 12. I feel tired after osteopathic treatment	3.64	0.97		2–5
PPM-O 13. I find it hard to concentrate after my osteopathic treatment	4.18	0.80		2–5
Total PPM-O Subscale Score – Education & Effectiveness	27.73	3.48		21–34
Total PPM-O Subscale Score – Cognition & Emotion	15.38	2.79		9–19

Table 3
Mokken item (Hi) coefficients for the Short Assessment of Patient Satisfaction (SAPS).

SAPS Item	Hi (Hawthorne et al.)	Hi (current)
1. How satisfied are you with the effect of your treatment?	0.52	0.02
2. How satisfied are you with the explanations the student osteopath has given you about the results of your treatment?	0.55	0.14
3. The student osteopath was very careful to check everything when examining you.	0.56	0.05
4. How satisfied were you with the choices you had in decisions affecting your health care?	0.55	0.26
5. How much of the time did you feel respected by the student osteopath?	0.58	−0.05
6. The time you had with the student osteopath was too short.	0.51	−0.006
7. Are you satisfied with the care you received in the clinic?	0.56	0.01

Table 4
Associations between individual Short Assessment of Patient Satisfaction (SAPS) items and the Patient Perception Measure – Osteopathy (PPM-O) subscales.

SAPS Item	PPM-O – Education & Effectiveness	PPM-O – Cognition & Emotion
1. How satisfied are you with the effect of your treatment?	0.54	0.06
2. How satisfied are you with the explanations the student osteopath has given you about the results of your treatment?	−0.15	0.04
3. The student osteopath was very careful to check everything when examining you.	0.28	0.03
4. How satisfied were you with the choices you had in decisions affecting your health care?	−0.01	−0.09
5. How much of the time did you feel respected by the student osteopath?	0.18	−0.26
6. The time you had with the student osteopath was too short.	0.57	0.40
7. Are you satisfied with the care you received in the clinic?	0.48	0.17

have been more focused on the ‘technical’ aspects of the care and not those interpersonal aspects that may lead to the patient feeling respected. An increased feeling of respect has been associated with positive practitioner communication behaviours [56] and subsequently better quality of care [57]. A patient who feels respected will often be engaged in the treatment process and feel comfortable to share information with their practitioner [56]. Conversely, research has suggested that a lack of respect displayed by a practitioner was considered by osteopathy patients to be an ‘adverse’ effect [58]. Other factors that influence respect for older patients include culture, previous relationships with older people, and an inadequate level of knowledge and experience with older patients [59]. However, in the current study it is not possible to ascertain if any of these factors influenced the patient's response to this SAPS item. As older patients increasingly seek osteopathy care [50], showing respect for elderly patients will be an important area for students to develop knowledge and skills prior to graduation.

Patients in the present study appeared to be indifferent to the practitioner explanation of the treatment they received (SAPS item 2, mean 2.6 ± 1.7). Although this item was negatively phrased in the SAPS questionnaire, the score did not change significantly when the data were recoded. This communication aspect is an important area to address in the osteopathy program, as effective communication is paramount to the patient-practitioner relationship and overall satisfaction with care [3,4,8,9,26]. Communication also has important implications for obtaining valid consent for manual therapy treatment. Shared decision-making and patient preferences for treatment is an important component of the informed consent process [60] which thereby empowering the patient and improving treatment compliance [57]. Taking account of patient preferences for their care may not be a prevalent feature of practice in the osteopathy student-led clinic (SAPS item 4, mean 2.8 ± 1.5). Particularly for less experienced clinicians, patient preference is infrequently taken into account when making clinical decisions [61]. As highlighted previously, it may be the student is focused on the technical aspects of care failing to elicit patient management preferences, or only doing so in a limited way. Although shared decision-making may develop with increasing clinical knowledge and experience, it should still be encouraged in the student-led osteopathy clinic.

4.2. Patient perception of osteopathy treatment

The present study found that the patients' perception of their osteopathy treatment, as measured by the PPM-O, was not influenced by age, SWL, previous osteopathic treatment, previous osteopathic treatment at VU Osteopathy Clinic or region of the presenting complaint. The limited influence of demographic data on the PPM-O measure builds on previous research [18] demonstrating no differential item functioning for these demographics and the PPM-O items. Patients in the present study were likely to agree that osteopathy care was effective for the management of their condition (PPM-O item 11, mean 4.15 ± 0.83) and that the student practitioners treated the whole body (PPM-O item 6, mean 4.12 ± 0.83). However, there may have been limited explicit discussion about the osteopathic principles with patients, as evidenced by PPM-O item 7 (mean 2.74 ± 0.99). As the osteopathic principles are thought to distinguish osteopathy from other manual therapy modalities [62,63] educating patients about how the principles have informed the management of their complaint it could be argued that this is potentially a missed opportunity for the promotion of osteopathy.

As the length of time that a patient had been receiving osteopathic treatment increased, patients reported a less thorough examination ($\rho = -0.28$). It is possible that at the initial consultation the practitioner performs a general screen of the body, formulates a provisional diagnosis and treatment plan to be executed in subsequent consultations [64], reducing the perceived extent of examination in return appointments. Conducting a thorough examination has been shown to be associated with satisfaction with care in physiotherapy student-led clinics [26]. In addition, patients reported a decreased feeling of respect with having received osteopathic treatment over a longer period of time ($\rho = -0.25$). This may be linked with the reduction of physical examination time where the patient may feel the practitioner is not providing the best possible care. It is also possible that the student practitioners may appear to be more complacent with an individual patients' care over time. Also, a patient may have a limited opportunity to develop a longitudinal relationship with a student practitioner due to changes in timetabling and availability for example. That said, patients are more likely to be satisfied with care when they have been receiving osteopathy care for a longer period of time ($\rho = 0.28$).

Patients who demonstrated higher scores on the PPM-O Education & Effectiveness subscale reported higher satisfaction with the effect of their treatment, the adequacy of the duration of the consultation, and

the appropriateness of the care they received. Previous research has established associations between patient perceived efficacy of care and all components of patient satisfaction [65]. However, efficacy of treatment is not always correlated with satisfaction with treatment [66], but has been shown to be associated with patient expectations of care [2,58,67]. Considering effectiveness of treatment cannot be guaranteed, by ensuring the patient feels satisfied with the care received and the time spent with the practitioner, patients are likely to perceive the treatment as effective. Previous studies indicate that positive treatment outcomes are associated with perceived effectiveness of care, and the information and education provided by practitioners [26,55,58,68]. Practitioners in the student-led osteopathy clinic should aim to develop skills in patient education, including clear guidelines for take-home management strategies and being thorough in questioning and treatment.

Patient's in the present study reported higher levels of cognitive and emotional affects if they felt the treatment time was too short (SAPS item 7, $\rho = 0.40$). The negative cognitive and emotional effects of manual therapy treatment such as feeling vague or tired, and having poor concentration are perceived as adverse effects [58] or potentially unfavourable outcomes of treatment [69]. Rajendran, Bright [58] also suggest that not being made aware of the possibility of experiencing these treatment outcomes can negatively influence the patients' thoughts on the effect of the treatment. It may be that communication of these effects is neglected when the time spent with a practitioner is less than expected by the patient. A practitioner may need to alter their communication strategies to ensure that potential effects of treatment are discussed, particularly for those patients who have had little experience with manual therapy and do not know what to expect from treatment [58].

4.3. Limitations

A significant limitation for this study was a low response rate (1.5%). However, this may not reflect the true response rate as patients who returned to the clinic more than once during the data collection period could not fill out more than one questionnaire. As the analysis was conducted on a small sample, these results may not be applicable to a wider osteopathy patient population. To improve the response rate, future studies could employ strategies such as: placing questionnaires in the treatment room as a visual reminder for the practitioner to administer them; administering the questionnaire in an electronic format; shortening the questionnaire; and/or, having a full time receptionist to take responsibility for recruiting participants. Further research with a larger sample size, and potentially using other measures of patient satisfaction, will deepen the understanding of patient satisfaction in osteopathy.

As the data was collected immediately following treatment, it was not possible to utilise mail out surveys or to give the questionnaire to the patient in the waiting room prior to consultation. For a higher response rate, a future study may consider changing the design to allow retrospective analysis of a historical consultation. Another limitation of this study may be patient hesitance to give feedback in case their practitioner reads their responses. As the questionnaire was handed to the patient in the clinic, patients may have avoided giving their practitioner negative feedback. As discussed, the SAPS measure was designed for and validated with a medical population [32] and it has demonstrated limited validity in a population seeking osteopathy treatment. Some items on this survey may need to be altered for improved specificity with osteopathy treatment. Further research will need to be conducted to determine the validity of the SAPS and other patient satisfaction measures with a population seeking osteopathy care. This research would be helpful in determining what expectations patients have of treatment and how care can be improved.

5. Conclusion

Satisfaction with treatment and care can influence a patient's compliance and participation with management. The results of the present study suggest that patients were satisfied with the effect of their treatment and satisfied with the care they received. Patient satisfaction was positively correlated with the Education & Effectiveness subscale on the PPM-O, providing evidence to support the content validity of this subscale. The results associated with the PPM-O are consistent with previous research, providing additional evidence for the internal consistency and structural validity of this measure. The results of the present study suggest that SWL may be associated with the effect of treatment, and this link provides an interesting avenue for further research in osteopathy, and manual therapy more broadly. Further research using other measures of patient satisfaction, in conjunction with the SAPS, may be required to evaluate its structural validity and internal consistency in a population seeking osteopathy care. Recognition of factors influencing patient satisfaction can facilitate improved patient care, efficacy of treatment, and inform the curriculum in osteopathy, and manual therapy, teaching programs.

Conflicts of interest

The authors report no conflict of interest in relation to this study.

Statement of competing interests

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Appendix A. Supplementary data

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