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Patient experience, satisfaction, perception and expectation of osteopathic manipulative treatment: A systematic review

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ABSTRACT

Introduction: Patient experience, satisfaction, perception and expectation are some related measures valued by patient-centered health care. Patient experience (PE) usually refers to objective, observable events or facts; while patient satisfaction, perception and expectation (PS) are measures which focus on a patient's subjective evaluation of the health care process. These concepts have been studied in osteopathic manipulative treatment (OMT), a therapeutic intervention practiced by osteopathic practitioners in many countries and by some medical doctors in USA and Canada.

Objective: To systematically review and summarize the primary research literature pertaining to PE and PS of OMT.

Methods: A comprehensive literature search was performed on seven databases: Ovid MEDLINE, Embase, Cochrane Central, Cinahl, AMED, Osteopathic Research Web, and OSTMED.DR to identify primary research that surveyed the PE or PS of OMT. Findings from relevant studies were summarized.

Results: The literature search identified 322 references, of which 16 were included in this review, including 7 qualitative, 8 quantitative and 1 dual-method study. The quantitative studies with various research instruments reported on a number of PE & PS aspects, with data showing mostly positive responses from patients. The qualitative studies revealed patients' perception of OMT which may be summarized as being patient-centered, holistic, thorough, a treatment option that could be effective for certain conditions and one that offered good clinician-patient partnership but with possible adverse effects and futility.

Conclusion: The primary literature reported mainly positive PE and PS of OMT. OMT as a treatment was found to have many positive characteristics.

1. Introduction

1.1. Background

Patient experience, satisfaction, perception and expectation, together with similar terms such as patient appraisal, perspective and view, are all related concepts sometimes used interchangeably by different authors. In this paper, we used patient experience (PE) and patient satisfaction (PS) as two umbrella terms to represent all the related terminologies. We always referred to the original terminologies used by the authors when we quoted the individual studies directly. All these concepts refer to a heath care consumer's overall evaluation of the health care process, which can be independent of clinical outcome or economic efficacy [1]. They are the foci of the patient-centered care (PCC) philosophy, which emphasize the values, needs, and desires of patients in healthcare discussions and decisions, with prominence given to the prevention and management of chronic illness, which requires strong relationships between patients and their primary care providers [2–4]. In PCC, the patient is not seen as a passive recipient of care, but as an active partner of health care operations, one who is invited to ask questions, participate and adhere to self-care [5,6].

According to the Agency for Healthcare Research and Quality,

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'patient experience' (PE) is more about objective events or observable facts, whether something that should happen in a health care setting actually happened or how often it happened [7]. It is the sum of all health care events, the interactions and the cultures across the continuum of care [1,5,7,8]. Examples include getting high quality medical treatments, timely appointments, easy access to information, good communication with health care providers, good amenities and courtesy such as comfortable waiting lobbies, etc. [7,9].

Patient satisfaction (PS), on the other hand, is an umbrella term we used to represent another group of related concepts such as patient perception, expectation, perspective, appraisal or view, all of which refer to a patient's personal, subjective value judgement, wishes or feelings, whether a patient is content with the care received [7]. The concept has its roots in marketing, and is a measure of how healthcare services meet the expectations of the consumer [7,10] It has been proposed by some authors that PS has an effect on outcome, as satisfied patients are more likely to utilize health services, comply with medical treatment, and continue with the healthcare provider [11].

For example, PE may be about the amount of time an osteopathic clinician spends with the patient, while PS may focus on whether the patient is happy with the amount of time the clinician has spent with him or her. There have been research instruments developed for measurement of PE and PS, and many hospitals in the USA have appointed chief experience officers to ensure a positive PE and PS [12–14]. According to a 2017 survey conducted in 26 countries worldwide including USA, Canada and the UK, PE was considered the top priority of their respective organizations. This was agreed upon by 82% of 1644 health care administrators and clinicians representing 1360 health care institutions which included hospitals, clinics and long term care facilities [15].

Osteopathic manipulative treatment (OMT), also known as osteopathic manipulative therapy or osteopathic manipulation, is a set of over a hundred manual therapy techniques used in osteopathy or osteopathic medicine. OMT was developed after the ideology of osteopathy founded by American physician Andrew Taylor Still in the late 19th century United States [16,17]. Today, OMT as a therapeutic intervention is practiced by osteopathic practitioners or osteopaths in the UK, Germany, Australia, New Zealand, France, Canada, and many other countries around the world, as well as by some medical doctors (doctors of osteopathic medicine) mostly in USA and to a much lesser extent Canada [18–20]. In the past OMT has been criticized for not being evidence-based, but with the emergence of new clinical studies, there is now a certain level of evidence supporting its efficacy for specific conditions. A 2016 guideline published by the American Osteopathic Association summarized and presented evidence from various clinical studies to date that OMT can be effective in reducing pain and improving functional status of patients with lower back pain (LBP) including pregnant and postpartum women [21]. A 2017 systematic review by Lanaro et al. summarized results of 5 trials involving 1306 infants concluded that OMT reduced length of stay of pre-term infants [22]. There are also lower quality evidences of OMT for pelvic pain, migraine, or irritable bowel syndrome in which further study is warranted [23–25].

The osteopathic philosophy views patients holistically, sees interrelated unity in all systems of the body and tries to understand how lifestyle and environmental factors impact well-being [23]. It emphasizes a close relationship between clinicians and patients, as well as collaboration between the lay public and the health care providers [26]. A US-based study found that osteopathic physicians were more likely to discuss personal matters with patients than allopathic physicians, covering family, social activities and patient emotions [26]. On the other hand, there were European studies reporting difficulties experienced by osteopaths in assessing and managing psychosocial function of patients [27,28]. For the purpose of this systematic review, the concepts of PE and PS are discussed together in an intermingled manner, and we do not distinguish between OMT practiced by medical doctors in USA and those offered by osteopathic practitioners in other parts of the world.

1.2. Objective

The objective of this study is to systematically review and summarize primary research in the peer-reviewed literature pertaining to PE and PS of receiving OMT.

2. Methods

2.1. Systematic review

To our knowledge there is no systematic review covering this topic and no existing protocol registered with PROSPERO [29]. We performed a systematic review of the peer-reviewed literature following the PRISMA guideline and checklist where appropriate [30].

2.2. Search methods

A literature search was conducted on seven databases in March 2018 by two authors (ML, HL) after consulting librarians at a teaching hospital library in Toronto (see acknowledgement), with the aim of achieving a comprehensive coverage: Ovid MEDLINE (R) < 1946 to February Week 5 2018 >, Embase Classic & Embase < 1947–2018 Week 11 >, Cochrane Central Register of Controlled Trials < February 2018 >, CINAHL < March 12, 2018 >, AMED (Allied and Complimentary Medicine) < 1985 to March 2018 >, Osteopathic Research Web and OSTMED.DR. Both controlled vocabularies (e.g. MeSH, Emtree terms) and free text keywords were used in performing the searches where appropriate

Table 1
Search strategies for medline and embase.

Database: Ovid MEDLINE(R) < 1946 to February Week 5 2018 > Search Strategy:
1 exp manipulation, osteopathic/(888)
2 exp osteopathic medicine/(2942)
3 exp manipulation, orthopedic/(3752)
4 (osteopathic adj2 (therap* or manipulat* or treatment or technique)).mp. (1153)
5 1 or 2 or (3 and 4) (3748)
6 exp patient satisfaction/(77598)
7 exp "patient acceptance of health care"/(130784)
8 exp patient compliance/(67145)
9 exp patient dropouts/(7555)
10 exp patient participation/(22073)
11 exp patient satisfaction/(77598)
12 exp treatment refusal/(11392)
13 ((patient* or family or spous* or caregiver*) adj2 (perspective or experience or compliance or comply or droupout or participat* or prefer* or satisf* or refus* or accept*)).mp. (267133)
14 or/6–13 (293492)
15 5 and 14 (64)
16 limit 15 to (english language and humans) (60)
Database: Embase Classic + Embase < 1947–2018 Week 11 > Search Strategy:
1 exp osteopathic manipulation/(130)
2 exp osteopathic medicine/(4428)
3 (osteopathic adj2 (therap* or manipulat* or treatment or technique)).mp. (1124)
4 1 or 2 or 3 (4979)
5 exp patient satisfaction/(116808)
6 exp patient attitude/(341554)
7 exp patient compliance/(136198)
8 exp patient dropout/(550)
9 exp patient participation/(23061)
10 exp treatment refusal/(16226)
11 ((patient* or family or spous* or caregiver*) adj2 (perspective or experience or compliance or comply or droupout or participat* or prefer* or satisf* or refus* or accept*)).mp. (409274)
12 or/5–11 (481680)
13 4 and 12 (157)
14 limit 13 to (human and english language) (140)

(Table 1). Resulting references were imported into EndNote X8 software for duplicates removal.

2.3. Inclusion and exclusion criteria

References were screened for suitability by two authors (ML, HL) independently during the first round of title and abstract screening, then again by two authors (ML, AW) independently during full text examination. Disagreements were discussed and resolved. All decisions were made according to the following inclusion criteria: 1. Peer-reviewed primary studies, 2. Focused on or at least had significant content dedicated to PE or PS of current or former patients who received OMT, 3. In English. References were excluded if they were: 1. Secondary studies, literature reviews, practice guidelines, editorials, expert commentaries, reports of patient education activities, unfinished studies, conference proceedings, 2. Focused on clinical outcome or economic evaluation.

2.4. Synthesis of results

Due to the heterogeneity of research design and research instruments used by the 9 studies with quantitative data, a meta-analysis to statistically combine all quantitative data was not feasible. We hence reported the findings narratively in the text and summarized the data in Table 2.

For qualitative studies, in order to provide a unified understanding of all themes and subthemes presented by the 8 studies, we categorized the findings summarized in Table 3 by performing a meta-synthesis using a thematic synthesis approach with the help of a text-tagging software QDA Miner Lite [31–33].

3. Results

3.1. Literature search & screening

The database search retrieved a total of 322 references (Table 1). After removal of 71 duplicates, the remaining 251 references were subjected to the first round of title and abstract screening, after which 184 were excluded. The full texts of 67 remaining references were examined in second round of screening with 51 references excluded for reasons in our exclusion criteria, including 2 studies which the authors did not clearly distinguish between OMT and other forms of manual therapies such as chiropractic and physiotherapy in their research [34,35]. A final 16 studies were included in our systematic review which included 8 studies with quantitative data only, 7 studies with qualitative data only, plus 1 study with both quantitative and qualitative data [36–51] (Fig. 1).

3.2. Quality assessment

The 16 studies included in the systematic review were assessed for quality with either the Center for Evidence-Based Management Checklist (for quantitative studies), or the Critical Appraisal Skills Programme Qualitative Checklist (for qualitative studies) [52,53]. The checklists are included in Appendices 1 and 2. The quality assessment was for reference purpose and we did not exclude any studies according to the results of the assessment.

3.2.1. Psychometric properties of quantitative research instruments

Among 9 quantitative studies, 5 used a research instrument which had been assessed for its psychometric properties. Judkins et al. (2017) used the Patient Perception Measure Osteopathy (PPM-O) developed by Mulcahy & Vaughan (2015), with proven construct validity and acceptable reliability estimations at > 0.80 on both sub-scales [36,54,55]. Mulcahy et al. (2014) used the Patient Perception Measure-Osteopathy in the Cranial Field (PPM-OCF) developed by themselves, with psychometric properties investigated previously by the authors with unpublished data. Internal consistency of the measure was said to be acceptable, but modification had been made for the larger scale study [37,56]. Licciardone et al. (2002) used a questionnaire adapted from the Form II of the Patient Satisfaction Questionnaire (PSQ) developed and validated by Ware et al., in 1983, but the adaptation itself had not been tested [41,57]. Another study by Licciardone et al. (2001) used a survey developed and validated by themselves in 1998 [42,58]. Pincus et al. (2000) adapted and used an assessed questionnaire by Linn et al. (1982) with acceptable validity and reliability [43,59,60].

Instruments used in 4 studies: Leach et al. (2013), Pomykala et al. (2008), Strutt et al. (2008) and Pringle et al. (1993) were developed by the authors and were not psychometrically assessed, though Leach et al. and Strutt et al. reported pilot-testing of the instruments before use [38–40,44].

3.4. Data extraction

Quantitative and qualitative data directly relating to PE or PS of OMT were summarized independently. Strutt et al. (2008) provided both quantitative and qualitative data, which were summarized separately [40]. Clinical outcomes, generic quality of life measures without pre- and post-treatment comparisons, and measures of non-OMT medical services provided by osteopathic physicians were all considered outside the scope of this systematic review and hence excluded.

3.5. Synthesis of quantitative studies

Sample sizes (n) of the 9 studies ranged from 42 to 1701. With the exception of the study by Pincus et al. which did not provide the information, response rates were between 15.2% and 82% [43]. Terminologies used to describe the main research question included PE, PS, patient perception and expectation.

Studies by Judkins et al. and Mulcahy et al. both reported that positive PE outweighed negative ones by a large margin [36,37]. Positive patient perceptions and emotions such as ‘relaxed’, ‘releasing’, ‘relieving’, and ‘unwinding’, were reported by more than half of patients, while negative perceptions and emotions such as ‘tingling’, ‘pain’, ‘pulsing’, and ‘emotional’, were reported by less than a quarter of participants [36,37]. Patients gave positive scores on domains of ‘education & effectiveness’ and ‘cognition & fatigue’ in the study by Judkins et al., and on domains of ‘therapeutic relationship’, ‘satisfaction with treatment’, ‘emotional and mood’ and ‘education and information’ by Mulcahy et al. [36,37]. In the study by Pomkala et al., patients perceived OMT as being able to reduce pain, reduce stress and anxiety, improve recovery and improve overall comfort [39]. OMT was perceived to be beneficial for mainly musculoskeletal disorders but less effective for disorders involving internal organs [42]. Majority of patient expectations such as involvement in decisions, self-management advice, healthcare providers demonstrating empathy, respect and listening, and being able to ask questions, etc., were met well or adequately [38]. The poorly or borderline met expectations included having the full attention of the clinicians during treatment (no other patients treated at same time), no discomfort after treatment, informed of complaints procedures, risks, communication with GP, etc. [38] One study found expectations of improvement after treatment were not fully met [44]. On PS, three studies found that most patients were satisfied with OMT [40,41,43]. Strutt el al found that an overwhelming majority of patients were satisfied with OMT and with the manner of treatment [40]. Study by Pincus et al. indicated that patients were more satisfied with OMT than regular medical treatment for low back pain [43]. The larger scale study (n = 459) by Licciardone et al. provided a detailed

Table 2
Characteristics and findings of quantitative studies.

Reference, Year, Country of Patients	Study Design, Research Instruments directly related to PE/PS of OMT	Purpose of study relevant to this systematic review	Population, Recruitment, Sample Size (n), Response Rate (%), Methodological Considerations	Control or Comparison to Non-OMT	Selected Findings relevant to PE and PS in OMT
Judkins et al. [36], 2017, New Zealand	Questionnaire/Survey. Patient Perception Measure-Osteopathy (PPM-O). A 13-item self-reported questionnaire with 5-point Likert scale used.	PE and perception of OMT	Patients of osteopath clinics in New Zealand, invited by osteopaths, n = 107, 46.52%, possible selection/voluntary response bias	None	Positive sensations/emotion reported by % of patients during or immediately after OMT: Relaxed (73.8%), Releasing (67.3%), Relieving (55.1%), Centered (51.4%), Softening (46.7%), Unwinding (45.8%), Lightness (45.8%), Warmth (38.3%), Balancing (34.6%), Happy (28%), Energetic (10.3%), Loose (9.3%). Negative sensations/emotion reported by % of patients during or immediately after OMT: Tingling (22.4%), Pain (17.8%), Pulsing (16.8%), Emotional (15%), Tight (8.4%), Uncomfortable (5.6%), Frustration (4.7%), Numb (3.7%), Sad (2.8%), Restless (1.9%), Embarrassment (0.9%), Anxious (0%) Education & effectiveness PPM-O subscale item total score: Mean 32.2 (out of 39, 39 being the best), median 32.5, range 23–39. Cognition & Fatigue PPM-O subscale total score: Mean 13.7 (out of 19, 19 being the best), median 13, range 2.8.
Mulcahy et al. [37] 2014 Australia & New Zealand	Questionnaire/Survey. Patient demographic survey with 22 item sensation list, Patient Perception Measure-Osteopathy in the Cranial Field (PPM-OCF) (33 item)	PE of OMT in the cranial field	Patients of osteopath clinics in Australia/New Zealand, invited by osteopaths, n = 42, 68.9%, possible selection/voluntary response bias	None	Positive sensations reported by % of patients during cranial field OMT: Relaxed (83.3%), Releasing (73.8%), Unwinding (57.1%), Warmth (45.2%), Softening (40.5%), Balancing (40.5%), Energetic (11.9%), Centered (11.9%), Happy (9.5%). Negative sensation reported by % of patients during cranial field OMT: Tingling (16.7%), Uncomfortable (4.8%), Sad (4.8%), Restless (4.8%), Emotional (4.8%), Anxious (4.8%) PPM-OCF Domain 1: Education and Information: mean score 21.00 (out of 25, 25 being the best), SD 3.39, median 21, range 12 PPM-OCF Domain 2: Satisfaction with Treatment: mean score 21.83 (out of 25), SD 2.32, medial 22, range 10 PPM-OCF Domain 3: Physical Perception of Treatment score 30.76 (out of 45), SD 3.64, median 31, range 16 PPM-OCF Domain 4: Therapeutic Relationship: mean score 9.10 (out of 10), SD 0.85, median 9, range 3 PPM-OCF Domain 5: Emotion and Mood: mean score 38.13 (out of 45), SD 3.34, median 38.5, range 14 PPM-OCF Domain 6: Cognitive Functioning: mean score 11.55 (out of 15), SD 1.83, median 12, range 7 Total PPM-OCF score 131.77 (out of 165), SD 11.27, median 130, range 56

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Table 2 (*continued*)

Reference, Year, Country of Patients	Study Design, Research Instruments directly related to PE/PS of OMT	Purpose of study relevant to this systematic review	Population, Recruitment, Sample Size (n), Response Rate (%), Methodological Considerations	Control or Comparison to Non-OMT	Selected Findings relevant to PE and PS in OMT
Leach et al. [38] 2013 UK	Questionnaire/Survey. Osteopathy-Your Views Questionnaire, 51 items.	Patient expectations of OMT and whether expectations were met	Patients of osteopath clinics throughout the UK, recruited by random sample (259) of osteopaths in UK, n = 1701, 15.2%, large scale national study with low response rate, possible selection/voluntary response bias	None	Expectations met well or adequately (15–100% patients said met): • Prevalent expectations (expectations of > 77.5% of patients): Evidence of qualifications, information on benefits, involvement in decisions, self-management advice, explanation of treatment and of cause of problem, comfortable waiting area, choice of appointment time and osteopath, value for money, case history taken, manual examination, empathy respect and listening, able to ask questions • Borderline expectations (72.5–77.5%): Clear diagnosis, privacy for undressing • Less prevalent expectations (< 72.5%): Gentle/vigorous treatment, symptoms improved, pain-free treatment Expectations borderline met (10–14.9% patients said met): • Prevalent expectations (> 77.5%): Prevention advice, other patients treated at same time, home exercises advice • Borderline expectations (72.5–77.5%): Discomfort after treatment, pre-visit information • Less prevalent expectations (< 72.5%): initial estimate of treatments required Expectations poorly met (< 10% patients said met): • Prevalent expectations (> 77.5%): Informed of complaints procedures; risks; confidentiality, communication with GP, disability access, referral on, asked about prior treatment effects, telephone advice • Less prevalent expectations (< 72.5%): Negotiate cost gown or towel provided, electrotherapy, gender of osteopath, able to have chaperone, consent form, worse after treatment, initial prognosis
Pomkala et al. [39] 2008 USA	Questionnaire/Survey. 10-Question Questionnaire, 10 point-scale.	Patient perception of OMT in hospitalized setting	Hospitalized patients in a hospital in USA within a one-year period referred and agreed to OMT were all asked to participate by osteopathic physicians, n = 160, 82%, possible selection/voluntary response bias	None	Perceived beneficial effects among patients (%): Decreased need for pain medications (43%), decreased pain (74%), improved overall comfort, easing recovery and reduced stress and anxiety (90%), improved recovery (94%), improved overall comfort (98%)
Strutt et al. [40] 2008 UK	Questionnaire/Survey. By mail, 6-Question Questionnaire which collects both quantitative & qualitative data	PS of OMT in an osteopathic training clinic (patient perception was investigated qualitatively instead)	Current or discharged patients of the training clinic of an osteopathic school in the UK within a 3-year period were contacted by mail, n = 181, 62%, possible selection/voluntary response bias	None except on one item 6% participants said prior treatment (non-OMT) not satisfactory	Quantitative data: From Question 3- Patient satisfaction (%): satisfied with treatment (> 90%), had reservation (7%), not satisfied (1%), did not give clear response (1%) From Question 5- Comfort with the manner of treatment: positive responses (89%), expression

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Table 2 (*continued*)

Reference, Year, Country of Patients	Study Design, Research Instruments directly related to PE/PS of OMT	Purpose of study relevant to this systematic review	Population, Recruitment, Sample Size (n), Response Rate (%), Methodological Considerations	Control or Comparison to Non-OMT	Selected Findings relevant to PE and PS in OMT
					of appreciation of service (38%), suggestions for change (18%) From transcripts of free text responses to Questions 2, 3 and 4: not fully satisfied (12%)
Licciardone et al. [41] 2002 USA	Questionnaire/Survey. 45-item Survey adapted from the Patient Satisfaction Questionnaire (PSQ) [61], 31 PS items, 5-point Likert scale used.	PS of OMT	Established patients at an ambulatory clinic for manipulative medicine in USA, who had visited at least twice, invited by clinical personnel, n = 459, 60.4%, possible voluntary response bias	None	Five point Likert-scale (Strong agree 1.0, agree 0.5, neither agree or disagree 0.0, disagree −0.5, strongly disagree −1.0) Responses to Positive Statements (abbreviated statements listed below) – Mean (SD): ● Convenient location 0.61(0.42), promptly seen 0.57(0.43), treatment even with no money with patient 0.30(0.46), insurance should cover more expenses −0.09(0.57), my doctor at this clinic treat all my family when they need OMT 0.20(0.47), doctors careful to check everything 0.50(0.42), doctors consider all aspects of my life 0.55(0.40), doctors talk to me about body's ability to heal itself 0.47(0.45), doctors ask me about diet -0.01(0.50), clinic has everything to provide comprehensive OMT 0.57(0.39), doctors treat me with respect 0.82(0.25), doctors do not recommend surgery unless no other way 0.46(0.42), doctors do their best keep me from worrying 0.56(0.36), staff professional on telephone 0.70(0.38), I am satisfied with the care 0.75(0.31), would recommend to friends and family 0.79(0.28) Responses to Negative Statements (abbreviated statements listed below) – Mean (SD): ● Parking not convenient 0.46(0.57), long wait for appointment 0.23(0.63), fee too high 0.14(0.50), family member needing OMT go to different clinics 0.24(0.43), hardly ever see the same doctor 0.63(0.47), doctors have not advised about ways to avoid illness or injury 0.42(0.53), medical problems in the past ignored 0.53(0.44), doctors do not encourage me to participate in my care 0.71(0.37), doctors taken risks in my treatment 0.58(0.43), doctors do not explain my medical problems 0.60(0.42), I do not feel a close relationship with doctors 0.52(0.45), sometimes doctors make me feel foolish 0.68(0.38), charge me for unnecessary expenses 0.48(0.43), things about the care I received could be better 0.29(0.50)
Licciardone et al. [42] 2001 USA	Questionnaire/Survey, Telephone survey. 139-item OSTEOSURV-I, 5-point Likert scale used.	Patient perception of OMT	Random sample of all adult residents of USA, overall n = 1168, 36% but not everyone responded to all questions, possible voluntary response bias	None except 2 items which asked whether healthcare provided by DOs is similar to that provided by MDs or DCs, question not specific to OMT	Perception of OMT (n = , % agreed): OMT is beneficial for musculoskeletal disorders (n = 480, 75.2%, $P < .001$) OMT is beneficial for disorder involving internal organs such as the lungs and stomach (n = 451, 41.0%, $P = .02$) Cost of OMT should be covered by health insurance (n = 432, 84.0%, $P < .001$)

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Table 2 (*continued*)

Reference, Year, Country of Patients	Study Design, Research Instruments directly related to PE/PS of OMT	Purpose of study relevant to this systematic review	Population, Recruitment, Sample Size (n), Response Rate (%), Methodological Considerations	Control or Comparison to Non-OMT	Selected Findings relevant to PE and PS in OMT
Pincus et al. [43] 2000 UK	Questionnaire/Survey. A questionnaire with 7-point scale filled during interview	PS of OMT for low back pain	Patients receiving care for low back pain from either Osteopaths or GPs in the same clinic in the UK, selected by clinicians, n = 60, response rate unclear. Possible selection bias as most patients were selected by osteopaths	Yes compare OMT to GP care for Lower Back Pain.	Osteopath vs GP service mean satisfaction scores for management of low back pain (7-point scale: 1-extremely dissatisfied; 7-extremely satisfied)**: Competence: Osteopath mean = 6.68, median = 7, range 4–7; GP mean = 6.00, median = 7, range 1–7. Quality of Care: Osteopath mean = 6.63, median = 7, range 5–7; GP mean = 6.2, median = 7, range 1–7. Efficacy: Osteopath mean = 5.25, median = 6, range 2–7; GP mean = 5.13, median = 6, range 1–7 Percentage of patients preference Osteopath vs GP for low back pain (prefer Osteopathy/prefer GP/No preference)*: Competence (38.33%/8.33%/53.33%) $P < .001$ Quality of care (33.33%/8.33%/58.33%) $P < .004$ Efficacy (35.29%/15.68%/49.01%) $P < .078$
Pringle et al. [44] 1993 UK	Questionnaire/Survey. Pre- and post-treatment	Patient expectation	Patients at five clinics in the UK were asked to participate, n = 367 completed post-treatment questionnaire, 73.4%. Possible voluntary response bias	None	Patient expectation (0 = 100%, 9 = no improvement) How much improvement expected (before treatment)? (1.49) How much improvement achieved (perception after treatment)? (2.35)

SD – Standard deviation *numbers calculated by authors of this systematic review using data from study.

Table 3
Characteristics and findings of qualitative studies.

Reference, year, country of patients	Study design	Purpose of study	Population, recruitment, sample size (n), response rate (%), methodological considerations	Control or Comparison to Non-OMT	Thematic analysis of PE or PS of OMT	
					Main themes	Sub-themes
Pollard-Smith et al. [45], 2017, UK	Semi-structured interviews, face-to-face, thematic analysis	PE of OMT among ballet dancers	Patients (ballet dancers) from a professional ballet company were e-mailed and purposefully sampled to represent a wide range of ages and dance experience, face-to-face interviews, n = 8, response rate unknown, possible selection/voluntary response bias	None except that one item asked how participant compare OMT with other treatment.	Effective treatment (if osteopaths understand dancing and dancers)	• Some therapists (osteopaths & non-osteopaths) unaware of physical demands of dancers • Some therapists (osteopaths & non-osteopaths) may lack empathy towards dancers about what the latter want to achieve • Treatment is more effective when the therapists understand dancing and stress experienced by bodies of dancers
					Returning autonomy	• OMT considered the whole body, not just area of injury, with potential to reveal an underlying cause of injury • OMT helped regain dance related posture • OMT was patient-centered, beneficial to long term functioning of the body • Enable patients a return to autonomy, able to self-manage • Some osteopaths were ex-dancers which helped
Orrock [46], 2016, Australia	Semi-structured interviews, via telephone, descriptive phenomenology	PE of OMT	Chronic low back pain patients of 5 osteopathic clinics which involved 9 osteopaths, the patients who were without pathological diagnosis, who had responded to initial survey were invited to participate in interviews, n = 11, response rate unclear, convenience sample, possible selection/voluntary response bias	None except that most respondents reported they used OMT after already consulted physiotherapists and/or chiropractors.	Patient decision making	• Trusting word of mouth referral • choosing after tried all else • alternative to chiropractic • GP referrals driven by patient choice
					Patient shared experiences of the osteopathic encounter	• Holistic • making musculoskeletal connections with presenting complaint • comprehensive assessment and review at each session • searching for a cause • consistently applied manual and adjunctive therapies •education about the condition and lifestyle advice for self-management
					Tailored patient-centered care	• Encounter is tailored to patient • individualised plan is matched to patient • goals of plan are patient centered • helps body to help itself •plan is a negotiated partnership •co-management
					Therapeutic relationship in healthcare	• Personal story is valued • extensive communication • encounter described as trusting, caring, gentle and instilling hope • supportive ongoing relationship if required
Consedine et al. [47], 2016, Australia	Semi-structured interviews, face-to-face, hermeneutic (interpretive) phenomenology	PE of OMT touch	Patients of 3 osteopaths, purposive sample recruited by osteopaths according to criteria, n = 5, 83.33%[a], possible selection/voluntary response bias	None	The Process – a physical interaction	• Engagement – let the session begin • Dialogue – knowing hands converse with an expressive body • Support – just holding
					Professionalism – the practitioner's responsibility	• Care – an empathic quality • Trust – a prerequisite for physical contact • Boundaries – a professional relationship
					Reassurance – a therapeutic necessity	• Knowledge – with seeing fingers • Competence – a knowing touch • Confidence – very reassuring

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Table 3 (*continued*)

Reference, year, country of patients	Study design	Purpose of study	Population, recruitment, sample size (n), response rate (%), methodological considerations	Control or Comparison to Non-OMT	Thematic analysis of PE or PS of OMT	
					Main themes	Sub-themes
Cross et al. [48], 2015, UK	Focus groups and individual telephone interviews, thematic analysis	PE of OMT	Patients at private osteopathic clinics, or clinics at public osteopathic educational institutions, purposively recruited by clinicians, n = 34 (focus groups n = 25, telephone interviews n = 9), response rate unclear, only include self-paying patients, possible selection/voluntary response bias	None except respondent's comments that OMT practitioners may provide an explanation to the cause of symptom while other providers may have failed to do so.	(OMT practitioner as) Individual agency	• Take control (stop patient from worrying) • Need to know (explain the cause of symptom) • Financial sacrifice (patient paid to see osteopath)
					Professional expertise	• Specialist knowledge and skills • Open-minded approach (will refer to other professionals if OMT cannot help) • Clear boundaries
					Customer experience	• Building rapport (feeling of being heard) • Healing environment (environment feels more 'holistic' than 'clinical') • Accessibility (available when required) • Value for money
					Therapeutic process	• Nature of intervention (surprise and uncertain about OMT) • Diagnosis (expected a diagnosis) • Impact on symptoms (pain relief) • Session duration (long enough to explain everything) • Ongoing maintenance/continuity of care • Degree of active involvement (listening, shared decision making, communication of diagnosis)
					Interpersonal relationship	• Seeking validation (to be believed and taken seriously) • Trusting relationship (faith in osteopaths' expertise) • Sense of connection (door remain open for continuity of care)
Bradbury et al. [49], 2013, UK**	Inductive qualitative interviews/thematic analysis, face-to-face or telephone interviews	Patient appraisal of public and private OMT	Patients who see osteopaths for LBP in private or public practices (or both), purposive recruitment through adverts or clinics to cover different socio-demographic backgrounds, n = 35 (face-to-face n = 28, telephone n = 7), unclear response rate, possible selection/voluntary bias	None except respondent's comment about shorter waits for OMT when compare with physiotherapy	Choice and control	• Shorter waits for OMT, long waits for physiotherapy • Patients involved in deciding how much treatment and when to end • Patients involved in referral to other services
					Vulnerability	• Fear of financial vulnerability when treatment is not really needed • Fear of spinal manipulations could cause damage • Female patients felt uncomfortable receiving treatment wearing only underwear
					Trust	• Patients appraised trust by perceptions of the practitioner • Patients appraised trust by perceptions of being cared for as an individual, which require tailored treatment • Patients appraised trust when they felt listened to and understood. Osteopaths did this well in both private and public clinics.
Rajendran et al. [50], 2012, UK**	Focus groups, interpretive approach, framework approach, thematic analysis	Patient perceptions of post-treatment experience, including adverse effect	1st Focus Group: volunteer patients and students of an Osteopathic Educational Institution who had received OMT, 2nd Focus Group: volunteer adult patients at the same OEI's clinic, n = 19, unclear response rate, possible selection/voluntary bias	None	Perception of adverse effect/quality of care was affected by:	
					Patient-practitioner encounter	• Communication • Information/advice (sufficient or not) • Trust/relationship • Practitioner competence • Dissatisfaction/inappropriate care (if happens)
					Environment	• Service provision – clinic administration (provides) support (takes) complaints • Teaching clinic (for) continuity of care • Service provision –facility/physical surroundings

(*continued on next page*)

Table 3 (*continued*)

Reference, year, country of patients	Study design	Purpose of study	Population, recruitment, sample size (n), response rate (%), methodological considerations	Control or Comparison to Non-OMT	Thematic analysis of PE or PS of OMT	
					Main themes	Sub-themes
					Treatment after-effects	• Personal responsibility/beliefs/behaviours (in interpretations of any adverse effect) • Loss of function/daily living tasks • Coping/tolerance • Lack of adverse effects (some patients think no pain is an indication of sub-optimal treatment) • Lack of response to treatment • Reversion/worsening • Pain
					Expectations of the osteopathic encounter	• (based on) Personal past experience of OMT (experienced patients did not see normal after effects as adverse effects) • Expected outcome of condition • Expectation of treatment-symptom relief/adverse events • Narrative of others • Knowledge and beliefs • Loyalty/expectation of results (do not want to blame osteopaths) • Hypothetical situations regarded as adverse
Strutt et al. [40], 2008 UK	Unstructured questionnaire/ survey by mail, inviting free text responses, interpretive phenomenology	Patient perception and satisfaction with treatment in a UK OMT training clinic	Current or discharged patients of the training clinic of an Osteopathic Educational Institution in the UK within a 3-year period were contacted by mail, n = 181, 62%, possible voluntary response bias	None except respondents comments "a dislike of taking tablets prescribed by the doctor", "had previously tried acupuncture and physiotherapy and these had not helped.	Factors that prompted positive patient perception and satisfaction of OMT:	
					Underlying personal values	• Beliefs • Social triggers (recommendation by other patients, curiosity, etc) • Empowerment (self-help suggested by osteopaths) • Being in control of care • Clarity of process (treatment plan, continuity of care)
					Hope (positive outcome gives hope)	• Symptom relief • Transformation-changes in health • Allaying fears, reassurance • Regaining control of life
					Communication	• First contact • Language appropriate (to patient's level of knowledge) • Effective communication (help patient understand the problem)
					Respect	• Consideration (listening, give enough time, caring)
					Trust	• Thoroughness (care and dedication) • Professionalism (knowledge and expertise) • Effectiveness (evidence of improvement
					(Common themes of patients who gave negative comments)	• Confusion • Lack of clarity (different diagnoses/treatment from different students or tutors) • No one could get to the root of the problem • Poor continuity of care • Failure of the booking system/loss to follow up
Westmoreland et al. [51], 2012, UK	Semi-structured interviews preceded by short questionnaires, thematic analysis	Patients' views of OMT for spinal pain in contrast with usual GP care	Patients registered at an osteopathic clinic and those who participated in a clinical trial [64] comparing OMT and usual GP care for spinal pain, purposive sampling to ensure a good range of demographics, n = 20 (n = 8 trial participants, n = 12 other patients), 44%, possible selection/voluntary response bias.	Compare GP medical care for spinal pain	Strength and limitation of GP care	• Restricted consultation time • Only provides painkillers and muscle relaxants • Not providing a cure • GP dismissive, patients felt disheartened and considered themselves a burden
					Advantages and disadvantages of GPs as complementary therapists	• Continuity of care if GP provide complementary therapy (such as OMT) • GP might lack expertise

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Table 3 (*continued*)

Reference, year, country of patients	Study design	Purpose of study	Population, recruitment, sample size (n), response rate (%), methodological considerations	Control or Comparison to Non-OMT	Thematic analysis of PE or PS of OMT	
					Main themes	Sub-themes
					Previous experience of osteopathy	• Most patients had positive previous experience with OMT
					Strengths and limitations of osteopathy	• Expected uncertainty, keeping open mind, expecting painful symptoms to be eased rather than providing a cure • Some considered adverse effect possible • Most patients thought OMT not useful for skin problem, may or may not be useful for asthma, bowel problem, but would benefit headache, migraine, back and neck pain • Like OMT does not rely on drugs
					Osteopathy has psychological as well as physical effects	• OMT has intense physical sensation that could be painful • physical benefits: pain relief, feeling better looser, relief of tension, increase mobility • Adverse psychological effects: surprising, unexpected, initially frightening and embarrassing • Psychological benefits: reassurance and improved understanding • Longer consultations allowed more time for explanation • Thorough physical examination developed good rapport
					Similarities and differences (OMT) with other physical therapies	• physiotherapy: use of heat therapy, machines, teaching of exercise techniques to patients rather than spinal manipulation, lack diagnosis, ineffective treatment, long wait lists • OMT consultations longer than chiropractic ones
					Osteopathy should be provided by the NHS in primary	• General agreement that OMT should be covered by NHS • Majority of participants would rather OMT be offered in primary care setting: more convenient, less intimidating, shorter referral time

[a] Number calculated by authors of this systematic review using data provided in study; ** study investigated OMT and other forms of manual therapies in the same study, only findings clearly on OMT were summarized here; ( ) within brackets are interpretations taken from the same study.

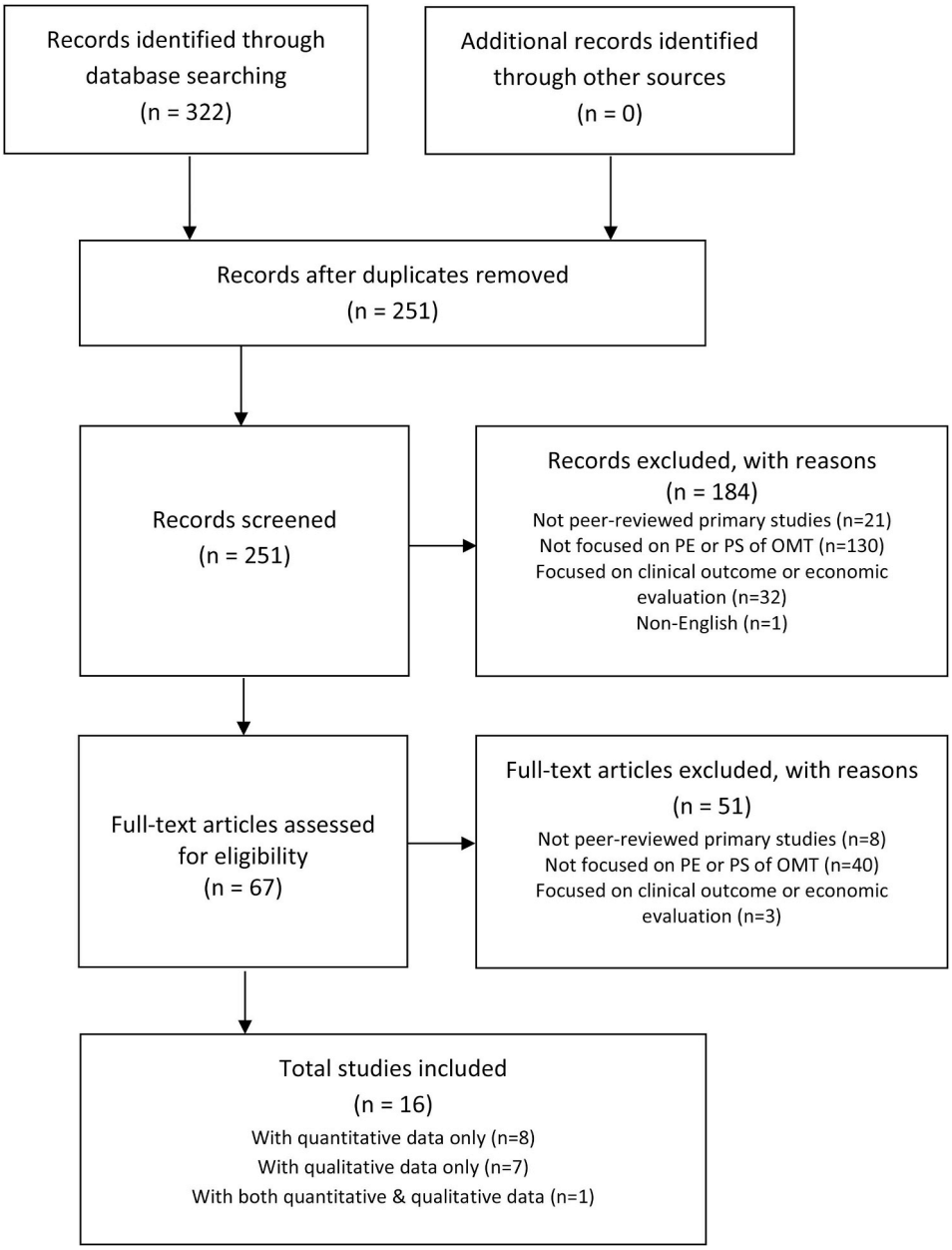

Fig. 1. PRISMA research process flow diagram.

breakdown of what patients were satisfied or dissatisfied with [41] (see Table 2). While most patients were satisfied with OMT and that they would recommend the service to friends and family, surprisingly at this clinic many patients felt doctors did not encourage them to participate in their care, or that they were hardly seen by the same doctor [41].

3.5.1. Comparison or control

Among the 8 studies, only the survey by Pincus et al. had a comparison built into the research design [43]. The study indicated that patients were more satisfied with OMT than medical treatment by GPs for lower back pain, in all three categories of 'competence', 'quality of care' and 'efficacy' [43]. While most respondents showed no particular preference, among those who showed a preference, more preferred OMT than medical treatment by GPs for lower back pain [43].

3.6. Synthesis of qualitative studies

The 8 qualitative studies included in this systematic review used terminologies such as PE, PS, patient perception, appraisal, view and expectation in regards to OMT. The research methods utilized included semi-structured, unstructured or open-ended questionnaires/surveys administered by mail, face-to-face or telephone interviews, and focus groups [40,45–51]. All studies used some form of thematic analysis approach (including descriptive phenomenology and interpretive phenomenology) to summarize the findings, to capture and formulate the essential structure and meanings of subjective lived experience [62,63]. We extracted the main themes and subthemes established by the 8 studies in Table 3. Due to the plurality of some studies we extracted only findings directly related to PE and PS of OMT and omitted others.

Sample sizes of the 8 qualitative studies ranged from 5 to 181. Four studies did not clearly indicate response rate, the other 4 reported a range from 6.83% to 83.33% [40,45–51]. Three studies were on OMT in general, one was on OMT experience of professional ballet dancers, one was specifically on OMT 'touch', one compared public and private OMT to public and private physiotherapy, one focused solely on adverse effects, and one compared OMT to GP service for spinal pain [40,45–51].

With the exception of the study by Strutt et al. [40], most participating patients from these 8 qualitative studies expressed more positive than negative experiences and satisfaction with OMT. With our thematic synthesis, we identified 5 overall themes that described the PE and PS across all 8 studies: patient-centered & holistic, thorough, a treatment option that can be effective in spinal pain, clinician-patient partnership, and possible adverse effects and futility.

3.6.1. Comparison or control

Among the 9 qualitative studies, only Westmoreland et al. implemented a more significant comparison [51]. It compared the PS of OMT to that of GP medical care for treatment of spinal pain, while also investigated the similarities and differences between OMT versus physical therapy and chiropractic. The results indicated that patients were less satisfied with GP medical care for treatment of spinal pain when compared with OMT. GP care were thought to be more restricted with consultation time, only provides painkillers and muscle relaxants, not being able to provide a cure, and GP practitioners were thought to be dismissive leading to patients feeling disheartened [51]. Patients also felt physiotherapy used heat therapy, machines and teaching of exercise techniques to patients rather than spinal manipulation, lack diagnosis, were ineffective and had longer wait list when compared with OMT [51]. Patients indicated OMT practitioners offered longer consultation time than chiropractic clinicians [51].

3.6.2. Patient-centered & holistic

OMT is perceived or experienced as being *patient-centered:* it is said to be 'tailored to patient', 'trusting, caring, gentle and instilling hope', offered 'individualised plan' and with 'extensive/effective communication' [45–47,49]. Clinicians were said to have an 'open-minded approach' (will refer to other professional if OMT does not work), are 'empathic', 'reassuring', 'accessible', provided 'validation' to patient stories (believe patients), encouraged 'active involvement' of patients in their own care, and enable patients' 'return to autonomy' [45,48]. Patients enjoyed 'shorter waits', felt 'longer consultations allowed more time for explanation', were invited to be 'involved in deciding how much treatment', and are spoken to with 'language appropriate' (to patients' level of knowledge) [49,51]. OMT was also experienced as being *holistic* [45,46]. 'Personal story is valued' and clinicians 'considered the whole body' and promoted the idea of 'help the body help itself' [45,46]. Patients felt listened to and understood, as well as being cared for as an individual [40,45,49].

3.6.3. Thorough

OMT was perceived or experienced as being thorough by participants of many studies [40,45,46,48,49,51]. Appointments tend to last longer, which allowed enough time to develop 'good rapport' and provide 'explanation' [48,51]. Some patients found OMT consultations longer than chiropractic ones and with practitioners more willing to offer manipulation and diagnosis [51]. 'Comprehensive assessment and review' was performed at each session, treat 'not just area of injury', and with 'potential to reveal an underlying cause of injury' [45,46,48,49,51].

3.6.4. A treatment option that can be effective in spinal pain

Many patients sought OMT after they 'tried all else' [46]. They felt OMT was an alternative to chiropractic care, physiotherapy as well as general medical care provided by GPs, the latter in which, in their opinion, relied too much on medications and could be ineffective in treating spinal pain [51]. Patients experienced and expected symptom relief from OMT of spinal pain [40,48,50,51]. Some thought OMT may also be beneficial for headache, migraine, and back and neck pain [51].

3.6.5. Patient-clinician partnership

Patients described their experience or perception as a 'negotiated partnership', a 'supportive ongoing relationship' or 'trusting relationship' with the OMT clinicians, in which a 'sense of connection' was valued and 'dialogue' was encouraged [46–50]. Patients felt they were in a 'co-management' of their own conditions, where they felt they were 'listened to and understood' [46,49].

3.6.6. Possible adverse effects & futility

Apart from all the positives reported, some patients expected or experienced uncertainty and the possible adverse effects, both during or after OMT which included 'initially frightening' manipulations, 'intense physical sensations', 'pain', 'worsening' of symptoms, and that treatment could be ineffective or even lead to 'damage' or 'loss of function' [49–51]. Some experienced dissatisfaction with their own 'financial vulnerability' (paying for unnecessary treatment), receiving different diagnoses and treatment from different clinicians, or felt embarrassed by 'receiving treatment wearing only underwear' [40,49,50].

4. Discussion

As the human lifespan continues to increase, the number of people living with chronic conditions and resulting disabilities is also on the rise, affecting both elderly and working-age populations [65–68]. While medical and surgical treatments can be effective in many diseases, there are certain chronic conditions such as non-specific low back pain and neck pain among others which may not always react well to or be suitable for medical or surgical interventions [69].

In the literature, reports on PS and PE of medical and surgical treatment for LBP had varied results. A study by Toye and Barker in the UK indicated that LBP had a strong psychosocial component, and that study participants were very dissatisfied with LBP care provided by their GPs [70]. Another study by Deyo and Diehl reported that majority of participants in the US were satisfied with medical care for LBP, but 24.5% felt they did not get an adequate explanation of their condition from their GPs, as a result 22.3% felt they did not understand what was wrong [71]. Sanders et al. and Ohnmeiss et al. reported a satisfaction rate of 84.27% and 69%, respectively, of spinal cord stimulation via implants for treatment of LBP in the US [72,73]. 82% of patients were satisfied with decompression surgery for lumbar spinal stenosis as reported by Paulsen et al. [74]. Shaw et al. found perceptions of communication skills of GPs had a bigger effect on PS than clinical outcome in treatment of LBP [75].

Literature is also available on the PS and PE of chiropractic care and physiotherapy for LBP. A UCLA study led by R.P. Hertzman-Miller, MD, found that chiropractic care had a higher mean satisfaction score than medical care for LBP [76]. Leininger et al. reported that spinal manipulation together with home exercise and advice offered a higher PS than general medical care and home exercise and advice [77]. LBP patients in Switzerland whose initial consultations were with chiropractic practitioners instead of medical doctors also reported higher PS [78]. High levels of PS for chiropractic care were reported in 4 other US studies which used various survey instruments [79–82]. Another study by Curtis et al. discovered that PS improved if GPs were trained in manual therapy techniques for LBP [83]. For physiotherapy, Lau et al. found that early physiotherapy intervention for acute LBP in emergency department improved PS, and Elustondo et al. reported 72% of participants were very satisfied or totally satisfied with physical therapy for neck pain [84,85].

While mainstream medical and surgical care provides irreplaceable and invaluable first line treatment to patients suffering from various conditions, many patients with certain conditions such as non-specific spinal pain remain dissatisfied. Some of them turned to complementary manual therapies such as OMT, chiropractic or physiotherapy and were satisfied. With many positive PE and PS attributes reported in the literature as summarized by our systematic review, we think OMT can provide a treatment option to this patient population, which effectiveness can be tested in more, larger scale clinical studies [23,86].

A study by Reader et al. found that communication and staff-patient

relationship are some of the top three complaints by patients in the health care system [87]. While some OMT practitioners adopted a more practitioner-led approach with less patient involvement, many others took on a communicator's role and practice with a more thorough, holistic and patient-centered approach that fosters good clinician-patient partnerships, as shown in PE and PS uncovered by many studies included in this systematic review [88]. We think the culture and the literature stemmed from the latter group may be of reference value to primary care practitioners or medical educators looking to improve PE and PS.

A limitation of this systematic review stemmed from the limitations of the included studies, such as possible selection or voluntary response bias, which are common among voluntary surveys or interviews. Some studies had small sample sizes, some chose a convenience or purposive sample without providing details. Some had very low or unreported response rates (e.g. Leach et al. at 15.2%), and some interviewed only self-paying patients [38,43,45,46,48–50]. It is possible that satisfied patients may be more eager to volunteer their opinions, and clinicians may tend to recruit patients who are more likely to give positive comments. Due to these limitations of the studies included, readers should interpret the results of our systematic review as suggestive rather than conclusive. Another limitation is that we used a thematic syntheses approach when summarizing the 8 qualitative studies, and as with any qualitative research methodology, this involves a certain level of subjective judgement of the reviewers [31,33]. A third limitation is that we limited to English materials published in peer-reviewed journals only. It is possible that we have missed some eligible grey literature, or non-English studies due to the language restriction.

Despite the limitations, we have added to the literature a summary of PE and PS of OMT as a human experience, the latter of which does not always require large scale studies to be meaningful [89,90]. With this study, we know among OMT patients who are willing to volunteer their opinions what they were satisfied or dissatisfied about OMT. As PE and PS have become a measure of health care quality and has been linked to positive outcome, the results of this systematic review is of reference value to clinicians, educators, students and researchers of OMT [43].

5. Conclusion

We have documented, both narratively and in tables, primary studies available in the literature on PE and PS of OMT. Sixteen studies presented both quantitative and qualitative data representing PE and PS of OMT as experienced by participating patients. Quantitative studies indicated more participants reported satisfaction with OMT than not, while qualitative studies reported characteristics of OMT which may be summarized by 5 main themes: patient-centered & holistic, thorough, a treatment option that can be effective in spinal pain, clinician-patient partnership, and possible adverse effects and futility.

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Appendix 1. Quality Assessment of Quantitative Studies*

Appraisal Questions	Ref. #				Y = yes	N = no	C = cannot tell		
	Judkins [36]	Mulcahy [37]	Leach [38]	Pomykala [39]	Strutt [40]	Licciardone [41]	Licciardone [42]	Pincus [43]	Pringle [44]
Did the study address a clearly focused question/issue?	Y	Y	Y	Y	Y	Y	Y	Y	Y
Is the research method (study design) appropriate for answering the research question?	Y	Y	Y	Y	Y	Y	Y	Y	Y
Is the method of selection of the subjects clearly described?	Y	Y	Y	Y	Y	Y	Y	Y	Y
Could the way the sample was obtained introduce (selection) bias?	Y	N	N	N	N	N	N	Y	N
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was the sample size based on pre-study considerations of statistical power?	C	C	C	Y	C	Y	Y	C	Y
Was a satisfactory response rate achieved (60% ≥)? (response rate)	N (46.52%)	Y (68.9%)	N (15.2%)	Y (82%)	Y (62%)	Y (60.4%)	N (36%)	C (unclear)	Y (73.4%)
Are the measurements (questionnaires) likely to be valid and reliable?	Y	Y	Y	C	Y	Y	Y	Y	C
Was the statistical significance assessed?	Y	Y	N	Y	N	Y	Y	Y	Y
Are confidence intervals given for the main results?	Y	Y	N	Y	N	Y	Y	Y	Y
Could there be confounding factors that haven't been accounted for?	C	C	C	C	C	C	C	C	C

* Center for Evidence-Based Management. Critical Appraisal of a Survey; 2014. https://www.cebma.org. Accessed Nov 15, 2017.

Appendix 2. Quality Assessment of Qualitative Studies*

Screening Questions	Ref. #			Y = yes	N = no	C = cannot tell		
	Pollard-Smith [45]	Orrock [46]	Consedine [47]	Cross [48]	Bradbury [49]	Rajendran [50]	Strutt [40]	Westmoreland [51]
Was there a clear statement of the aims of the research?	Y	Y	Y	Y	Y	Y	Y	Y
Is a qualitative methodology appropriate?	Y	Y	Y	Y	Y	Y	Y	Y
Was the research design appropriate to address the aims of the research?	Y	Y	Y	Y	Y	Y	Y	Y
	Y	Y	Y	Y	Y	Y	Y	Y

Was the recruitment strategy appropriate to the aims of the research?								
Was the data collected in a way that addressed the research issue?	Y	Y	Y	Y	Y	Y	Y	Y
Has the relationship between researcher and participants been adequately considered?	Y	C	C	C	C	C	C	C
Have ethical issues been taken into consideration?	C	C	C	C	C	C	C	C
Was the data analysis sufficiently rigorous	Y	Y	Y	Y	Y	Y	Y	Y
Is there a clear statement of findings?	Y	Y	Y	Y	Y	Y	Y	Y
Could the way the sample was obtained introduce (selection) bias?**	Y	Y	Y	Y	Y	Y	Y	Y

*Critical Appraisal Skills Programme. CASP Qualitative Research Checklist; 2017. http://www.casp-uk.net/casp-tools-checklists. Accessed Nov 3, 2017.
**Question added by us.

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