New Zealand Osteopaths’ Use of Patient-Reported Outcome Measures with Patients who have Chronic Low Back Pain: A Cross-sectional Survey

Evania Natalie-Anne Vallyon

Acknowledgements

This thesis is the product of many conversations and other peoples’ belief in me when I may have otherwise quit. My heartfelt thanks go to Saeideh Aminian for being the best ally and supervisor that a research student could hope for. Saeideh, it has been both a privilege and delight to work with you. I have so appreciated being able to trust in your kindness, diligence, and intellect. Thank you!

I would like to thank my partner, Lance Cablk, for trusting me to finish and for picking me up at various points in this research process. Lance, you have enriched my life alongside this thesis and this has helped me stick it out to the end. Thank you!

Many thanks to my mum, Catherine Vallyon, for her steadfast belief in me throughout this project. Mum, if anyone has instilled a growth mindset in me it is you! Also to my father, Philip Carter, for being a fine example of someone who is willing to fall in love with the process and persevere.

Thank you to Samantha Heath for offering feedback in the later stages of this research process. Sam, I have so appreciated your knack for being supportive while also extending my thinking. Your feedback has made me want to fall into conversation with you!

Sue Palfreyman, you witnessed first-hand some of the early challenges that I faced due to indecision and a lack of confidence. Your feedback has been instrumental to my progress at various points in this research process. Thank you!

For their help in the research process, I would also like to thank: Sylvia Hach, Arun Deo, Anna Whitehead, Nathalie Dussart, Hamish Syrett, Sam Mallinson, Osteopaths New Zealand, and the team at Osteopathy Research Connect – New Zealand. In particular, Dr Amie Steel, Dr Jon Adams, and Dr Wenbo Chang. Thank you also to Dr Norasieh Amin, Dipti Vora, and Adrian Jenkins for their help via Unitec’s library services.

For their personal support, I would also like to acknowledge Lolita and Ludwik Rynkowsky, Alex Raichev, Isaac Carter, and Amanda Cook. Thank you all for your encouragement at different points in this process!
Preface

Patient-Reported Outcome Measures (PROMs) are instruments that capture patients’ perspectives of their own health status without interpretation by anyone else \[1\]. As part of rising advocacy for their use in clinical practice, PROMs are said to be particularly promising for the management of long-term conditions like chronic low back pain (LBP). A proposed reason for this is that the feedback of individual PROMs data may enhance communication and empower patients for patient-centred care.

Although extensive research exists on healthcare practitioners’ use of PROMs in clinical practice, little is known about New Zealand osteopaths’ use of the measures either in general or for specific conditions such as chronic LBP. This thesis addresses this gap by describing New Zealand osteopaths’ use of PROMs with patients who have chronic LBP. In addition, by exploring potential barriers and facilitators to osteopaths’ use of PROMs, the thesis investigates factors that may influence future implementation. Its emphasis on perceived advantages also raises the need for an exploration of how and why osteopaths think that PROMs should be used in their management of chronic LBP.

This thesis is comprised of four sections. The first section, the literature review, serves to describe how and why PROMs may be used in clinical practice and by extension osteopathic practice. Consideration is given to the potential significance of PROMs for osteopaths’ work with patients who have chronic LBP. With this understanding of PROMs and their potential for osteopathic practice, the focus then shifts to describing manual therapists’ use of PROMs in clinical practice and for LBP. This behavioural focus sets scene for an elaboration of common barriers and facilitators to therapists’ use of the measures. Emphasis is once again placed on describing and exploring osteopaths’ use of PROMs within the constraints of the available literature.

Section two provides an overview of the methodological considerations that led to the design of this study. The section begins with a description of the theoretical approaches—the Capability Opportunity Motivation–Behaviour system and the Theoretical Domains Framework—that informed the study's investigation of barriers and facilitators. Both approaches are examined for their utility and issues of ‘mis-match’ are discussed. Following this, the section expands on why a cross-sectional survey-based design was identified as most appropriate for the aims of this study. Considerations regarding sampling, questionnaire creation, and modes of survey distribution are all discussed. The issue of declining response rates is also met with a review of mitigating strategies.
Section three presents the research in a manuscript format in accordance with the International Journal of Osteopathic Medicine’s ‘Author Information Pack’ (Appendix A). The manuscript consists of the abstract, introduction, methods, findings, and discussion. All appended resources are provided in a fourth section at the end of the thesis. These resources include but are not limited to the ethics approval letter, ‘Participant Information Sheet’, and survey questionnaire.
# Table of Contents

**Declaration**.................................................................................................................. ii

**Acknowledgements**...................................................................................................... iii

**Preface** ............................................................................................................................. iv

**List of Figures** ................................................................................................................ ix

**List of Tables** .................................................................................................................. ix

**Section One: Literature Review** .................................................................................. 1

Patient-Reported Outcome Measures in Clinical Practice................................................. 2
  Patient-Reported Outcomes and their Measures.............................................................. 2
  Patient-Reported Outcome Measures’ Applications in Clinical Practice.......................... 3
  Patient-Reported Outcome Measures’ Impact in Clinical Practice.................................. 5

Patient-Reported Outcome Measures in Osteopathic Practice.......................................... 7
  Osteopathy and Osteopathic Practice.............................................................................. 7
  Advocacy for Patient-Reported Outcome Measures in Osteopathic Practice............... 9
  Patient-Reported Outcome Measures’ Significance for Osteopathic Practice............... 11

Patient-Reported Outcome Measures for Chronic Low Back pain.................................... 15
  Definition of Chronic Low Back Pain............................................................................. 15
  Epidemiology of Chronic Low Back Pain ..................................................................... 15
    Prevalence of Chronic Pain and Chronic Low Back Pain.......................................... 15
    Burden of Chronic Pain and Low Back Pain.............................................................. 16
  Patient-Reported Outcome Measures in Practice Guidelines...................................... 18

Manual Therapists’ Use of Patient-Reported Outcome Measures.................................... 18
  Manual Therapy and its Professions.............................................................................. 18
  Physiotherapists’ and Chiropractors’ Use of Patient-Reported Outcome Measures........ 19
  Osteopaths’ Use of Patient-Reported Outcome Measures.......................................... 21
  Determinants to Using Patient-Reported Outcome Measures........................................ 21
    Capability.................................................................................................................. 22
    Opportunity............................................................................................................... 23
    Motivation................................................................................................................. 24

**Section Two: Methodology** .......................................................................................... 26

Theoretical Approach......................................................................................................... 27
  COM-B ......................................................................................................................... 27
  Theoretical Domains Framework ................................................................................. 28
  Purpose for Using the COM-B and Theoretical Domains Framework.......................... 29
Appendix A: International Journal of Osteopathic Medicine................................. 92
Appendix B: Survey Questionnaire................................................................. 110
Appendix C: Participant Information Sheet.................................................... 117
Appendix D: Participant Invitations ................................................................ 118
Appendix E: Ethics Approval Letter.................................................................. 120
Appendix F: ORC-NZ Sub-study EOI Application ............................................ 121
List of Figures

Figure 1. Frequency of PROMs' use with patients (n = 79) ........................................... 68
Figure 2. Frequency of specific PROMs' use with patients (n = 79) ................................... 69
Figure 3. Frequency of PROMs' applications with patients (n = 79) ................................... 70
Figure 4. Determinants to respondents' use of PROMs with patients (n = 58) ................. 73

List of Tables

Table 1. Characteristics of survey respondents (n = 79) .................................................. 67
Table 2. Determinants to respondents' use of PROMs with patients (n = 58) .................. 71
Table 3. Facilitators to respondents' use of PROMs with patients (n = 58) ..................... 72
Table 4. Benefits of using PROMs with patients (n = 40) ............................................... 74
Table 5. Barriers to using PROMs with patients (n = 47) ............................................... 76
Section One: Literature Review
Patient-Reported Outcome Measures in Clinical Practice

Patient-Reported Outcomes and their Measures

Patient-Reported Outcomes (PROs) and their measures have gained significant popularity among healthcare professionals in recent years, albeit with variation in how they are defined [2–4]. For the purposes of this review, we adopt the United States’ Food and Drug Administration’s [1] definition of PROs as “any report of the status of a patient’s health condition that comes directly from the patient without interpretation of the patient’s response by a clinician or anyone else” [p2]. This definition is selected as it emphasises the significance of patients’ perspectives on their own health and is commonly cited in the field [5–10]. Following this, we use the term Patient-Reported Outcome Measures (PROMs) to describe the instruments used to measure and operationalise PROs [11]. Although the measures are commonly referred to as ‘PROs’ in the United States [3], we prefer the United Kingdom’s variant of the term—‘PROMs’—as it helps to distinguish the measurement instruments from informal patient report [12]. There are indications that the term ‘PROMs’ is commonly used in New Zealand as well [13,14].

After more than 30 years of development, standardised questionnaires continue to be the most long-standing and common form of PROMs available [2,3]. These questionnaires are commonly described as either generic or specific based on their constructs and target population. Whereas generic PROMs are typically posed as relevant to the general population [2,3,15,16], findings have shown that they do not always apply to the young and the very old [17]. Specific PROMs can nevertheless be differentiated by their narrower target population, which is specific to a condition or disease [2,3,15,16]. As for their constructs, generic PROMs often measure several constructs across different domains [2,3,17] while specific PROMs address only a few (e.g., the symptoms and functioning associated with a condition [16]). This distinction may not be consistent however as some generic measures are said to address one construct while other specific measures reportedly address more [15,17]. Today the most widely used PROMs include generic health-related quality of life measures; in particular, the EuroQoL EQ5D and the Short-Form SF-36 [2]. There are no ‘gold standard’ examples of specific PROMs however several are popular for use with chronic pain [18–21] and low back pain [22,23]. In keeping with their design, generic PROMs tend to be most suited for making comparisons between populations or conditions, while specific PROMs tend to be more responsive to longitudinal change over time [3,15,16].
Broadly speaking there appears to have been a shift in emphasis from making measures more specific to biomedical issues (e.g., conditions/diseases) to increasing their relevance to the patient as an individual [2]. Two types of PROMs—individualised PROMs and computer adaptive PROMs—serve these ends, albeit in rather different ways. Whereas individualised PROMs forego standardisation to enhance their sensitivity to the individual, computer adaptive PROMs retain standardisation in favour of increasing the precision of traditional standardised instruments [17]. Individualised PROMs rely on respondents to actively identify their values and needs, while computer adaptive PROMs rely on computer learning algorithms to iteratively select items based on patient’s previous responses [2]. Both types of measures have been said to have great potential for use in clinical practice [2]. The Measure Yourself Medical Outcomes Profile [24] and the Patient-Specific Functional Scale [25] are two common examples of individualised PROMs [2,3,26]; the latter of which has also been promoted to New Zealand osteopaths [27]. The Patient-Reported Outcomes Measurement Information System (PROMIS) [28] is a set of measures that can be used as computer adaptive PROMs.

Significant attention has been given to the development and testing of PROMs so there are now many measures available [3]. A leading database—the Patient-Reported Outcome and Quality of Life Instruments Database (PROQOLID)—accounts that it holds 2300 Clinical Outcome Assessments of which PROMs form a substantial part [2,29]. While databases such as PROQOLID help users find PROMs, the predominance of competing measures has foregrounded the need for quality appraisal in their selection. For this reason, standardised tools and methods have been developed to evaluate PROM’s psychometric properties (reliability, validity, responsiveness, etc) and their ease of use (administration burden) [2]. The ‘Evaluating the Measurement of Patient-Reported Outcomes’ (EMPRO) tool [30–33] and the ‘COnsensus-based Standards for the selection of health Measurement Instruments’ (COSMIN) checklist [34–36] are two prime examples.

**Patient-Reported Outcome Measures’ Applications in Clinical Practice**

As the sole ‘objective’ measure of patients’ subjective outcomes, PROMs are often said to complement traditional assessment procedures both within and outside of the clinical consultation. Established outcome measures like biomarkers, imaging, and physical examinations have long been recognised as poor correlates of patients’ subjective outcomes [7,9,15,37,38]. One of the first rationales for the inclusion of PROMs in clinical trials was that an intervention could appear biomedically successful while posing risks to a patient’s health-related quality of life (e.g., chemotherapy) [37,38]. Clinicians can also rely on the case history to assess subjective outcomes at an individual level, however the ‘objectivity’ of their assessment
is challenged by a range of biases [7,39,40]. Observer bias is of particular concern as it most affects observations that rely on subjective judgement (aka PROs) [41]. As a kind of detection bias, observer bias produces a “systematic difference between a true value and the value actually observed due to observer variation” [41,42]. Observers’ judgements of patients’ pain states have, for example, been found to vary by age, gender, ethnicity, presence of organic findings, litigation status, reported pain intensity and pain distress levels [43]. PROMs are said to mitigate observer bias and are thereby posed as complementary to the case history in the clinical consultation [7,39].

There are several applications for which PROMs can be used in clinical practice and these have been described in a variety of ways [2,11,44–46]. Greenhalgh et al. [3] recently provided one of the most extensive summaries of the intended purposes for PROMs at an individual level. Through reviewing clinical trials and advocacy papers, Greenhalgh et al. [3] identified that PROMs have been advocated for three purposes: 1) to improve the detection of patient problems by screening 2) to support clinical decision-making about treatment by monitoring, and 3) to empower patients to become more involved in their care through personalised care planning. The latter rationale may also extend to facilitating patients’ self-management of long-term conditions [3]. Although researchers have historically referred to the latter purpose as facilitating Patient-Centred Care [2,44–46], the concept is ‘fuzzy’ in its definition and so is less useful than the purpose described above [47,48]. Patient-Centred Care can instead be regarded as a philosophical driver for the increased advocacy for PROMs in clinical practice [9]. For understanding, each application and their proposed purpose(s) are expanded upon below.

Screening consists of a single PROM application with subsequent review by the healthcare practitioner [45,46]. As mentioned, its purpose is to identify issues (like depression) that may otherwise go undetected [11,45]. Advocacy for PROMs screening tends to assume that an issue is being underdiagnosed and therefore not managed appropriately. Several early clinical trials [49–52] evaluated the impact of screening on the basis that increased detection of an issue (like depression) may result in appropriate actions being taken with improved health outcomes thereafter [3].

Monitoring consists of several longitudinal PROM applications with subsequent review by the patient and/or healthcare practitioner over time [3,45,46]. It is envisaged that clinicians may use monitoring for two different purposes. In the first place, clinicians may monitor direct health outcomes to assess a patient’s overall progress relative to the expected progress. In the second, clinicians may assess indirect health outcomes to assess the impact of treatment or
management on a patient’s health-related quality of life. Reflection on these impacts has been proposed to lead to changes in management that may improve health outcomes overall [3].

Whereas clinicians are presented as the locus of change in screening and monitoring, the patient comes to the fore in PROM’s application for personalised-care planning and self-management. Towards these ends, PROMs have been envisaged to help patients share their perspectives on their condition in such a way as to inform goal setting and action planning. This personalised care planning has then been thought to support both clinician management and patient self-management. PROMs have also been said to support shared decision-making so that decisions reflect patients’ values and priorities. These processes rely on the availability of aggregate PROMs data so that patients may make ‘informed’ decisions [3,9,45]. Beyond personalised care planning for self-management, electronic PROMs (ePROMs) have also been developed for patients to self-monitor their long-term condition(s). Patients can use data from ePROMs to decide whether to continue managing their health independently or to reach out to health professionals for help with their care [3].

**Patient-Reported Outcome Measures’ Impact in Clinical Practice**

With PROMs being advanced as a ‘good idea’ for use in clinical practice, significant attention has been given to determining their impact on processes and outcomes of care [3,15,16]. At least 12 systematic reviews [5,8,53–62] have been published on this topic over the course of the past decade. Most of these have been traditional reviews of randomized controlled trials [5,8,53,55–62], however a qualitative review has characterised the impact of PROMs based on healthcare practitioners’ perspectives [54]. To date, the impact of PROMs has been examined across a variety of healthcare settings. Of the reviews listed above, most are specific to oncology [8,53,60,62] or primarily consisting of randomised trials from oncology as seen in a review on PROMs’ impact in palliative care [59]. Several reviews address PROM’s impact across clinical settings [5,54,55,61], albeit they include no primary studies from physiotherapy, chiropractic and osteopathic care. The remaining reviews attend to PROMs’ impact in the management of non-malignant pain [56] and mental healthcare [57,58].

Despite their prevalence, traditional reviews have struggled to quantify the impact of PROMs feedback due to the complexity of the PROMs intervention and subsequent heterogeneity between intervention studies. Whereas it is generally agreed that PROM interventions consist of patients completing one or more questionnaires with results then being reviewed by or ‘fed back’ to clinicians and/or patients, there is less agreement on the finer details of implementation [3,55,63]. To implement PROMs as an intervention, researchers must decide on
goals, identify patients and settings, select questionnaires, establish administrative and scoring procedures, report results, interpret scores, define protocols for addressing findings, and decide on indicators to assess their impact in clinical care. Each of these decisions offers opportunity for heterogeneity. To date, studies have varied in their administration, timing, and frequency of feedback. They have varied in who receives feedback and the nature of that feedback. They have also varied in their endpoints suggesting disagreement on what the interventions are supposed to achieve.

Although it is challenging to draw conclusions, a prominent pattern across the literature suggests that PROMs feedback to healthcare practitioners and/or patients probably impacts processes more than outcomes of care. This pattern has been evidenced by several reviews including Gibbons et al.'s most recent and comprehensive Cochrane Review on the feedback of PROMs data to either healthcare practitioners and/or patients in clinical practice. Reporting on processes of care, Gibbons et al. found that feedback probably leads to a moderate increase in patient-physician communication, diagnoses, and notation, along with probable improvements in disease control. Reporting on health outcomes, they also identified that PROMs' feedback probably produces small improvements to quality of life yet probably does not improve general health perceptions, social functioning, and pain. They remained uncertain on the effects of PROMs' feedback on fatigue and physical or mental functioning and found no evidence of adverse effects. In keeping with the broader literature, the researchers' overall confidence in their findings was constrained by the low quality and number of studies related to each indicator particularly as related to outcomes other than quality of life. For this reason, the aforementioned pattern—that PROMs feedback probably impacts processes more than outcomes of care—could be liable to change with further high-quality research.

Researchers have posed different hypotheses for why PROMs’ feedback appears to impact processes more than outcomes of care. Most recently, Gibbons et al. attributed the pattern to a ‘cascade’ of declining effect sizes from processes to outcomes of care; with proximal changes affecting distal outcomes as primary and then secondary effects. According to their hypothesis, PROM feedback could be immediately linked to proximal changes in processes of care: improving diagnosis, treatment, quality of care and patients’ use of healthcare services. These proximal changes would then facilitate distal improvements in symptoms, functioning and quality of life. Greenhalgh et al. took this cascade a step further by arguing that a ‘blockage’ could also impede PROMs’ feedback from fully affecting secondary or distal outcomes. In their view, the finding that PROMs’ feedback increases communication but not subsequent actions (e.g., referrals) gives cause to investigate this ‘blockage’.
observations coupled with an appreciation of the implicit heterogeneity between PROMs’ applications have led to greater context-sensitivity in research supporting the implementation of PROMs. Researchers are increasingly investigating ‘how and in what circumstances PROMs work’ through novel methodologies like Realist Synthesis rather than simply whether and how much PROMs work [3,64–66].

Patient-Reported Outcome Measures in Osteopathic Practice

Osteopathy and Osteopathic Practice
As yet, no universal definition exists for the terms ‘osteopathy’ and ‘osteopathic medicine’ [67]. The Osteopathic International Alliance [68] accounts that osteopathy is defined by its philosophy and the practice of osteopathic manipulative therapy; however, this is contradicted by debates on the principles that synthesise osteopathic philosophy [69–73]. There are many ways to classify osteopaths’ position in these debates. Fryer [69] categorised three sets of beliefs as osteopathic principles 1) are of continued importance for contemporary osteopathic practice, 2) might be read alongside or replaced by modern conceptions of patient-centred care and the biopsychosocial model of health, and 3) are of no value for evidence-informed care. At the risk of polarising the debate, these stances can also be theorised on a spectrum between ‘traditional’ or ‘innovative’ based on the extent that they rely on historical conceptions of osteopathy [74]. Traditional attitudes are generally characterised by the belief that osteopathic principles are essential for osteopathic identity. In contrast, innovative attitudes are characterised by efforts to theorise osteopathy in accord with the biopsychosocial model and evidence-informed healthcare [69].

Given that there is no universal definition of osteopathy, national regulatory boards and professional associations define the term in various ways. In these definitions, it is possible to trace ‘traditional’ vs ‘innovative’ efforts to conceptualise osteopathy. The General Osteopathic Council [75], for instance, appears fairly traditional in defining osteopathy based on the osteopathic principles. In their words:

“Osteopathy is a system of diagnosis and treatment for a wide range of medical conditions. It works with the structure and function of the body and is based on the principle that the well-being of an individual depends on the skeleton, muscles, ligaments and connective tissues functioning smoothly together.” [75]
Contrastingly, the Osteopathic Council of New Zealand (OCNZ) makes no mention of osteopathic principles when defining osteopathic medicine. The council appears to avoid making a philosophical statement by basing the definition on osteopathic techniques and osteopaths’ role in the New Zealand healthcare system. In their words:

“Osteopaths use a variety of techniques to help correct abnormal physical conditions which include back and neck pain, headache, physical injuries to bones, joints and muscles and many other physical and functional disorders. A wide variety of treatment techniques are used, which could include manipulation and mobilisation to joints and soft tissues, muscle energy stretches and cranial-sacral therapy. The osteopath will use appropriate treatment after fully assessing the patient.”

Although this definition provides no information on the council’s philosophical stance, OCNZ acknowledges that osteopaths have “a particular interest in evidence-based diagnosis and treatment”. The council also advises that osteopaths “ensure patients receive holistic health and well-being advice and treatment”; however, without reference to what ‘holistic’ means. The council provides no indication about whether this holism relates to the biopsychosocial model.

A preliminary search indicates that professional associations define osteopathy in terms of the biopsychosocial model internationally. Professional associations in the United Kingdom and Australia, for example, describe that osteopaths take the time to understand patients as individuals. Osteopaths reportedly listen to a patient’s medical history and circumstances to form a comprehensive picture of their presentation, and this picture is at times associated with understanding the “root cause” of a patient’s pain. Through the biopsychosocial model, osteopaths are purported to treat the “whole” patient. They are said to do this by developing a “personalised plan” or “package of care” that is tailored to the patient’s needs. Notably, this emphasis is absent from the promotion of osteopaths’ practice in New Zealand. Osteopaths New Zealand describes that “osteopaths can identify important types of dysfunction in your body” without any mention of appraising patients as individuals. This definition tends towards a ‘traditional’ (or perhaps antiquated) conception of osteopathy and does not fulfil the purpose of promoting osteopathy to key stakeholders within contemporary healthcare. In failing to pay attention to the role of the patient, the definition falls short of aligning with concepts of patient-centred care.

Over the course of the last century, osteopathy has been professionalised in more than 50 countries around the world. Socio-political forces have led to two distinct professional
streams being developed [67,68]. In the United States, ‘osteopathic physicians’ practise medicine and are distinct from medical doctors only in their additional training in osteopathic philosophy and osteopathic manipulative therapy. In other countries such as Australia and New Zealand, ‘osteopaths’ practise as primary care practitioners within limited but broad scopes of practice. Unlike osteopathic physicians, osteopaths are not able to prescribe medicine and perform surgery [67,68]. Osteopaths’ role in the broader healthcare system continues to be contested with some sources relying on osteopaths’ history as complementary and alternative medicine providers [82] and other sources promoting osteopaths as allied primary care practitioners [76,78]. As with the definition of ‘osteopathy’, this dichotomy speaks to ongoing tensions in the development of the profession. Osteopaths are generally characterised as having a particular interest in the neuromuscular system, however some sources also include the visceral and ‘bio-energetic’ systems [82–84]. In New Zealand, osteopaths provide a range of primary healthcare services including screening, assessment, diagnosis, conservative treatment, health education, and communication with other healthcare professionals [76,81].

Advocacy for Patient-Reported Outcome Measures in Osteopathic Practice

To date, advocacy for osteopaths’ use of PROMs appears to have been led by three of four key academics. Australian academics, Michael Fleischmann and Brett Vaughan, co-authored commentaries [7,85,86] that advocate for 1) osteopaths’ collection and wide-scale use of both aggregate and individual PROMs data, 2) osteopaths’ education on how to interpret the clinical significance of PROMs data, and 3) osteopaths’ adoption of PROMs when designing and writing a case report. Both authors praised the value of individual PROM data for screening and managing low back pain (LBP) [87]. Several years ago, Vaughan and DiVenuto [23] spearheaded an early commentary that advocated for the use of PROMs as outcome questionnaires. Alongside this contribution, Carol Fawkes has led the exploration and development of a nationwide system to collect routine PROMs data from osteopathic patients in the United Kingdom [88–91]. Given that her work has aimed to collect aggregate PROMs data for the purposes of performance measurement and benchmarking, it is not immediately relevant to our focus on the utility of individual PROM data in osteopathic practice. In the following section, relevant articles are reviewed for an understanding of how and why individual PROM data has been said to be useful in osteopathic practice.

Fleischmann and Vaughan [7] recently wrote an aspirational article titled ‘The challenges and opportunities of using patient-reported outcome measures (PROMs) in clinical practice’. Although the authors claim to target their article at ‘clinical practice’, it is apparent that they
attempt a broad appraisal of PROMs’ diverse functions at different levels of healthcare decision making. Fleischmann and Vaughan [7] do not just focus on the use of individual PROM profiles in clinical practice. Rather they include uses for aggregate PROMs data alongside individual PROM data without making a clear distinction between them. Other reviews [3,15,26,92] have explicitly distinguished between the purposes for using aggregate PROMs data versus individual PROM data. A key reason for this is that “the feedback and public reporting of aggregate PROMs data to stimulate [quality improvement] efforts by providers [is] based on a different set of programme theories from the feedback of individual PROM data in the care of individual patients” [3][p.6]. In other words, the rationales for using aggregate versus individual PROMs data are irreducible as they are not the same.

On re-reading Fleischmann and Vaughan’s [7] article, efforts were made to identify how and why they recommend that individual PROM data be used in osteopathic practice. Generally, PROMs were said to be valuable for monitoring patient outcomes and facilitating communication to further patient-centred care. The benefits of monitoring were rarely mentioned; however, the researchers acknowledged that PROMs could make “a verifiable case for the effectiveness of a treatment” (p.57) and also could be useful for practice improvement. The researchers may have inferred further benefit when they acknowledged that PROMs could be useful for facilitating patients’ and clinicians’ behaviour change. They also appeared to infer the benefit of monitoring when recommending PROMs for the development of case studies (a topic on which they published another article) [86]. Beyond monitoring, Fleischmann and Vaughan [7] also identified several ways in which PROMs could facilitate communication. The researchers recognised that PROMs could be used to aid multidisciplinary team discussions. Although they noted that PROMs data could inform patient choice and shared decision-making, it is unclear whether this relies on the use of individual or aggregate data. Prior reading has indicated that aggregate PROMs data can indicate the relative success of a treatment and thereby be used to inform shared decision-making [9].

Across the literature, monitoring appears to be among the most discussed applications for PROMs in osteopathic practice [7,23,85]. As mentioned, monitoring was a key focus in Fleischmann and Vaughan’s [7] discussion on the opportunities of using PROMs in clinical practice. Monitoring also featured as the primary focus of Vaughan and DiVenuto’s [23] early article on ‘outcomes questionnaires’ in osteopathic practice. Approximately two decades ago, these authors argued that PROMs provide important information regarding patients’ function. These authors were reasoning that third-party payers encouraged the monitoring of patient function over time, and further that PROMs could evidence effectiveness at an individual level. Although the researchers indicated that PROMs could also be useful in the design of
appropriate management plans, they did not expand upon this application. Generally, it is unclear why monitoring has received most attention in the osteopathic literature. Given that PROMs’ advocacy has been driven by the same group of researchers, it is plausible that the emphasis reflects their idiosyncratic beliefs. After all, Fleischman and Fryer [93] recently claimed monitoring as PROMs’ primary function for osteopathic practice without explaining why this is so.

Given the limitations and narrow scope of advocacy thus far, there is a need for the further theorisation of how, why and in what circumstances individual PROMs data might be used in osteopathic practice [7]. The following section ‘sets the scene’ for this work by exploring some of the problems in osteopathy that PROMs might help to address. Comprehensive theorisation of PROMs’ applications in osteopathic practice exceeds the scope of this review.

**Patient-Reported Outcome Measures’ Significance for Osteopathic Practice**

In their recent commentary, Thomson and MacMillan [94] presented a comprehensive example of an innovative attitude towards osteopathy. These researchers appraised “the foundational assumptions, practices and claimed distinctiveness upon which osteopathy was built and continues to be structured” (n.p.) with a view to progress the profession. The researchers conceived five areas as highly problematic. Three of these five areas—osteopathy’s inherent biomedicalism, monointerventionism, and default practitioner-centredness—provide context for thinking about the potential significance of PROMs for osteopathic practice. Each of these areas is described below with a view to consider PROMs’ significance, both in general and with patients who have chronic low back pain (LBP).

According to Thomson and Macmillan [94], osteopathy’s historical identification with anatomical and physiological knowledge demonstrates a commitment to biomedicalism. Osteopathy historically envisaged bodies to be like machines that break down and need the repair of an expert ‘human engineer’ (aka an osteopath) [94]. In doing so, it conceptualised the body as “unlived, objective, [and] estranged from the patient or person.” (n.p.) Thomson and MacMillan [94] provided some evidence to suggest that biomedicalism continues to be prevalent in osteopathy (n.p.) [95–97], and identified no evidence that osteopaths’ regard for the biopsychosocial model [97,98] has translated into practice. This is problematic insofar as ‘non-specific’ musculoskeletal pain conditions are influenced by psychological, social, and other contextual factors [97]. It is also problematic for individuals with LBP who are greatly affected by their own and society’s perceptions and reactions to their pain [99]. Inappropriate responses (e.g., biomedical practice) are known to result in a heavy reliance on healthcare along with an
unnecessary avoidance of physical activity, social activity, and work [99]. In other words, the disability-burden of LBP is known to be partially iatrogenic for this reason [100].

In addition to critiquing biomedicalism, Thomson and MacMillan [94] argue that osteopathy’s historical preoccupation with palpation and manual therapy is problematic in the context of contemporary healthcare. In their view, identification with ‘hands-on care’ (aka monointerventionism) fails to represent osteopathy as the complex healthcare intervention that it is or could be. It also fails to recognise that osteopaths have scope to provide a range of other interventions including the development of a therapeutic alliance, patient education, movement or exercise, and the promotion of self-management. In the context of patient assessment, exclusive reliance on ‘hands-on care’ also fails to inform practitioners of the patient’s individuality and the complex biopsychosocial factors contributing to their presentation; thereby limiting practitioners to biomedical care. Thomson and Macmillan [94] reference surveys from the United Kingdom [95], Australia [101], and Belgium [102] to claim that manual therapy continues to characterise osteopathy internationally. Another survey [81] illustrates that manual therapy also features prominently among New Zealand osteopaths. Some (albeit not all) of these surveys [81,101,102] indicate that the predominance of manual therapy in osteopathy may be at the expense of other therapeutic approaches like psychologically informed pain management [103].

Person-centred care has been considered an important and occasionally also a defining feature of osteopathic practice [104–106]. In positioning osteopathy practitioners as ‘knowing’ and ‘doing’ things to a patient, it has been argued that they more frequently deliver practitioner-centred rather than person-centred care [94]. Thomson and MacMillan [94] problematise this view with Thomson’s [107] previous qualitative findings that some osteopathic practitioners adopt a practitioner-centred approach to care. Although these deliberations appear tentative, Thomson & MacMillan [94] make a persuasive case that the profession needs to pay increased attention to shared decision-making. By their explanation, shared decision-making involves a “positional shift” (n.p.) where the clinician emphasises the patient as an active partner in their own health. Shared decision-making requires patients to share their knowledge, experiences, and values so that decisions can be negotiated and agreed upon. Thomson and MacMillan [94] establish that this patient-centred approach is important because clinical outcomes may be influenced by the nature of therapeutic relationships [108,109]. They further identify shared decision-making as a requirement among osteopathic regulators internationally [110,111] and in New Zealand [112].
Although PROMs are not a ‘magic pill’ for biomedicalism, monointerventionism, and practitioner-centred care, PROMs are tools that may have potential to help address these problems. Previous theories suggest that PROMs may be used to improve the detection of patient problems, to support clinical decision-making about treatment, and to empower patients to become more involved in their care [3]. These theories inform speculation about how PROMs might be used to address the above problems.

In a recent systematic review of barriers to using a biopsychosocial approach to osteopathic practice, Sampath [97] identified that osteopaths may not use objective tools (aka PROMs) to assess psychosocial symptoms. Apparently, some practitioners were not aware of such tools while other practitioners simply chose not to use them. Where Sampath [97] claimed that “This led osteopaths to either ‘avoid or underdiagnose’ the contribution that psychosocial factors may have in their patient’s symptoms” (p704), it appears that PROMs may be essential. This echoes prior theories that the use of PROMs is essential for identifying issues like depression that may otherwise go undetected [11,45]. A host of PROMs are available for assessing psychosocial factors associated with pain and chronic pain [10,113]. In the osteopathic context, screening tools have most often been promoted for the identification of psychosocial factors that predict a poor prognosis (aka ‘yellow flags’) [114]. However, other tools are available to measure outcomes associated with pain beliefs and coping [113]. Given that it is unclear what psychosocial outcomes should be assessed by osteopaths, there is cause for reflection on osteopaths’ scope of practice and professional role. This reflection could be engaged alongside a review of the contemporary frameworks [115–117] that Thomson and MacMillan [94] recommended for addressing biomedical practice.

While the biomedical paradigm centres on medicalisation and cure, current calls for action on LBP emphasise the importance of living well with the condition [100,118]. Positive health—as “the ability to adapt and self-manage in the face of social, physical, and emotional challenges” [100] (p2384)—is being advocated as ‘best practice’ for addressing the disability burden of LBP. Here it is possible that PROMs may support these ends as they have been envisaged to empower patients to become more involved in their care [3]. Electronic PROMs (ePROMs) may be particularly helpful for supporting patients’ self-monitoring of their condition [3]. Further investigation is needed to explore the nature and appropriateness of these interventions for patients who have chronic LBP.

Where Thomson and MacMillan [94] advocate for the intentional and “judicious use of ‘hands-on’, ‘hands-off’ or ‘hands-less’ interventions”[93] to address monointerventionism, PROMs may be of use. PROMs may be conceived as part of any of these interventions, however have
scope to support greater patient autonomy and decreased reliance on manual therapy [3]. In critiquing monointerventionism, Thomson and Macmillan [94] also suggest that osteopaths may place excessive reliance on their palpatory skills to understand patient’s subjective outcomes. This possibility is problematic because physical examinations are poor correlates of patients’ subjective outcomes [7,9,15,37,38]. PROMs are useful in this context because they provide accurate means of assessing patients’ subjective outcomes [7,39]. Where musculoskeletal pain conditions are more strongly associated with subjective outcomes [119,120] than structural imaging findings [121,122] and specific spinal postures [123], PROMs may therefore be of use.

At first glance, PROMs appear to be an obvious choice when looking to support a more person- or patient-centred way with patients. As mentioned, PROMs’ rise in popularity can be largely attributed to policy efforts towards Patient-Centred Care [9]. PROMs have also been said to support efforts towards shared-decision making, and there is increased advocacy for osteopaths to use PROMs towards these ends [7]. Closer evaluation, however, reveals that PROMs do not in and of themselves improve communication. Rather “clinicians use of PROMs [has been found to be] shaped by their relationships with patients and their professional roles and boundaries” [64] (p.1). With this in mind, the utility of PROMs may be reviewed within the broader project of moving towards a more person-centred way of being with patients. Thomson and Macmillan [94] recommend various strategies towards these ends.

With a preliminary understanding of PROMs and their potential in-hand, the remainder of this review shifts focus to describe osteopaths’ and other (so-called) manual therapists’ use of individual PROMs data in their clinical practice. On first proposing this study, it was anticipated that this could be explored within osteopaths’ assessment and management of patients with chronic LBP. This was for several reasons. As above, the use of individual PROMs data has potential to benefit osteopaths’ management of chronic LBP. In addition, osteopaths may play a key role in managing the burden of chronic LBP. Overmedicalisation has led to recommendations for LBP to be managed in primary care [124]. As there is a shortage of pain care specialists in New Zealand [125], primary care providers may play a key role in managing the national burden of chronic pain and chronic LBP. Incidentally, chronic LBP may also be a common long-term condition that osteopaths themselves face [126,127]. The following section sets the scene for this investigation by describing the problem of chronic LBP in general terms. It also determines how PROMs are presented in current guidelines for chronic pain and LBP.
Patient-Reported Outcome Measures for Chronic Low Back Pain

Definition of Chronic Low Back Pain

Chronic Low Back Pain (LBP) is pain in the low back area that persists or recurs for longer than three months, with or without sciatica[128,129]. As a composite term, chronic LBP is comprised of definitions for pain, chronic pain, and LBP. ‘Pain’ refers to “an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage”[130], and ‘chronic pain’ is simply that which persists or recurs for longer than three months[131,132]. The term ‘low back pain’ serves to localise this pain to the low back area between the inferior costal margins and horizontal gluteal folds[129,133]. It also references a close association with sciatic pain, which is namely radicular pain that passes down the course of sciatic nerve[133]. It is worth noting that chronic pain has been commonly conceived as pain that persists beyond the normal time-period for tissue healing[134,135], yet the temporal definition selected includes chronic pain conditions that involve sustained tissue injury and inflammation over time (e.g., osteoarthritis, spondylosis, and autoimmune conditions)[131,132]. Secondly, for understanding, chronic pain is commonly contrasted with acute pain[136]. While chronic pain may be conceived as a complication and/or progression of acute pain, it is important to note that the distinction is purely temporal and is therefore not necessarily reflective of physiological factors underlying and maintaining the pain[136].

Epidemiology of Chronic Low Back Pain

Prevalence of Chronic Pain and Chronic Low Back Pain

To date, population estimates for the international prevalence of chronic pain have varied widely within and between countries[135,137]. Within the United Kingdom estimates have ranged between 13%-51% of the general population[135,138,139]. Within the United States estimates have ranged between 11%-40% of the general population[137,140]. Decidedly more adults have been said to experience chronic pain in low- to middle-income countries than developing countries; with approximately one in three adults (33% prevalence) in low- to middle-income countries and approximately one in five adults (18% pooled prevalence) in developing countries reported to experience chronic pain[141,142]. Broadly speaking, the wide-ranging nature of these estimates may be partly attributed to inconsistencies in researchers’ methods of estimation and definition(s) of chronic pain, in addition to differences in time, place, and population[135].
New Zealand’s best evidence on the national prevalence of chronic pain currently comes from the New Zealand Health Survey [143], which is a continuous survey of the general population. The most recent report of findings accounts that approximately one in five New Zealanders (19.7%) experienced chronic pain in 2020/2021 [144]. This marks a slight increase from the one in six people who reported having chronic pain six years earlier [145]. Both sets of findings may be underestimates as they rely on a definition of chronic pain where pain must last for more than six months [146] which is 50% longer than the International Association for the Study of Pain’s current definition [131,132]. It has also been suggested that respondents under-report common conditions (e.g., migraine) on account of not understanding that they are in fact chronic pain [147]. The number of New Zealanders with chronic pain is expected to continue increasing as the population ages over time [148]. Although findings may be compared with international estimates—for example, New Zealand may have fewer cases of chronic pain than the United Kingdom [135,138] and the United States [137,140]—it is difficult to draw conclusions due to the inconsistencies previously identified.

Presently it is unclear what the global and national prevalence is for chronic LBP, however there is some suggestion that the lower back may be a relatively common site for chronic pain. Reporting on the prevalence of chronic pain in different countries, Jackson et al. [59] identified 33% chronic pain in the general adult population, of which 18% experienced chronic LBP. Although this seems insignificant, only migraine (39%) and musculoskeletal pain (26%) were of greater proportion. Findings from the 2010 New Zealand Chronic Pain Survey [147] indicated that chronic pain was typically experienced in more than one site, with the most common site being the lower back (59%) (59). Depending on the aetiology and number/distribution of pain sites, this implies that a common presentation may have either been chronic widespread pain or some form of chronic LBP with multisite pain [132,149,150]. Findings most likely represented people who sought help for their pain as the survey was distributed to healthcare providers with the request that patients respond if they had chronic pain [147,148].

**Burden of Chronic Pain and Low Back Pain**

Although the global burden of pain has been posed as inordinately large [137], research has yet to provide a clear picture of the global burden of chronic pain. A word search for ‘chronic pain’ in publications from the Global Burden of Disease (GBD) study—the most comprehensive global epidemiological study to date—indicates that there has been no direct report on the global burden of chronic pain [151–154]. This could be because it is only now with the implementation of the International Classification of Disease-11 that chronic pain is being recognised as a disease [132,155]. Despite this apparent omission, researchers have claimed that the GBD study highlights a large burden of chronic pain [135,156,157]. Most notably, Rice et
al. have argued that findings from a GBD 2013 analysis present chronic pain as the most important health challenge world-wide. Chronic pain was by their interpretation the leading cause for Years Lived with Disability (YLD) in 2013. Chronic LBP was in their view the single greatest cause for YLDs. YLD is a statistic that measures health loss due to years spent in less than full health. The concept is important as it represents the impact that a condition has on both individuals and their support networks including families, communities, and health/social services.

Currently few estimates are available for New Zealand’s burden of chronic pain. Best estimates suggest that chronic pain is of a similar size to the national burden of anxiety and depressive disorders, which is about 5% of the total annual health burden. Based on this, it was estimated that chronic pain accounted for over 54,000 Disability-Adjusted Life Years (DALYs) in 2016. DALYs are a statistic that represents the total health loss caused by a disease. A single DALY represents the loss of one year of full health and the total DALYs for a disease or health condition “are the sum of the years of life lost due to premature mortality (YLLs) and the years lived with disability (YLDs) due to prevalent cases of the disease or health condition in a population”. Most of chronic pain’s DALYs are due to high disability rather than premature mortality. This is supported by both global statistics and a strong association between the prevalence of chronic pain and disability. Chronic pain was estimated to cost New Zealand between $13 to $14.9 billion in 2016 (more than diabetes and dementia, respectively). Without any changes to management, these costs are predicted to rise to an exorbitant $21.2 to $24.3 billion by 2048.

Although Rice et al. pronounce chronic LBP as a leading cause of disability worldwide, GBD collaborators typically present LBP as a leading cause of disability instead. LBP has most recently been identified among the top ten causes for global health loss (or DALYs) among 10-74-year-olds. In New Zealand, LBP has been reported as the most common cause for health loss among people aged 15-64 years, second for those aged 65-74 years and sixth for those aged 75 and older. Finally, the burden of LBP has been said to be growing and is predicted to rise. Between 1990-2015, the global burden of LBP grew by 54%, culminating in a final year with approximately 60.1 million YLDs. New Zealand’s burden grew in a similar manner with a 50.3% rise in DALYs between 1990-2017. Both increases have been attributed to population growth and aging, rather than a relative increase of LBP in a stable population over time. Although this means that the burden of LBP is neither growing nor improving relative to the New Zealand population, it does imply increasing costs overall. It also raises the possibility of a growing burden of chronic LBP as its prevalence tends to rise with age.
Patient-Reported Outcome Measures in Practice Guidelines

Given the lack of definitive evidence for PROMs’ impact in clinical practice, it is unsurprising that clinical practice guidelines do not currently recommend for or against the use of PROMs for chronic pain \[164,165\]. Some guidelines do recommend the use of prognostic screening tools (e.g., the Keele STarT Back Screening Tool) for patients with new episodes of acute LBP; the purpose being to identify those at risk of chronic pain and disability \[114,166–169\]. Guidelines do not advocate the use of these tools for patients who already have chronic LBP, and this may be because there is insufficient evidence to recommend its use as a prognostic indicator for future pain \[170\]. A single set of guidelines recommends the use of PROMs to monitor LBP. The Royal Dutch Society of Physical Therapy \[112\] recommends that physiotherapists and manual therapists incorporate the Numerical Rating Scale, the Patient-Specific Complaints instrument, and the Quebec Back Pain Disability Scale into their history taking to monitor the burden of non-specific LBP. Administration is recommended at both the beginning and end of a period of treatment for the comparison of findings. Administration of the Numeric Rating Scale and Patient-Specific Complaints instrument is recommended over the course of treatment as well \[171\].

Manual Therapists’ Use of Patient-Reported Outcome Measures

PROMs’ implementation is said to be underdeveloped across healthcare, particularly at the level of individual clinical decision-making \[2\]. Efforts are consequently being made to describe healthcare practitioners’ use of PROMs along with potential barriers and facilitators to implementation \[54,172,173\]. Research investigating manual therapists’ use of PROMs has only emerged in the last 10 years, with most of it being published in the last five years \[93,127,174–181\]. Research prior to these dates appears to have focussed on manual therapists’ use of standardised outcome measures rather than PROMs as such \[40,182–184\]. By definition, these standardised outcome measures include generic and specific PROMs. They do not include the newer developments of individualised and computer adaptive PROMs.

Manual Therapy and its Professions

Manual therapy has been similarly defined by the American Physical Therapy Association \[185,186\] and the International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT) \[187\]. According to these organisations, manual therapy involves a set of techniques using “skilled hand movements”. These techniques aim “to improve tissue extensibility, increase range of motion, induce relaxation, mobilize or manipulate soft tissue and joints, modulate pain, and reduce soft tissue swelling, inflammation, or restriction” \[185–187\].
Reportedly, the IFOMPT further requires that these techniques are performed by appropriate healthcare professionals for them to constitute manual therapy.

Beyond professional scopes of practice, there appear to be no strict rules on what professions can or cannot practise manual therapy. For this reason, it is important to qualify why research on ‘manual therapy professions’ so often focusses on physiotherapy, chiropractic, and osteopathy. Generally these three professions have been said to have more similarities than differences. All three professions have a strong historical association with ‘hands-on’ techniques; albeit debates are ongoing regarding each profession’s and, in particular, physiotherapy’s current level of identification with them. All three professions consult with individuals who have similar musculoskeletal complaints. Finally, all three professions may be regarded as allied to medicine, although chiropractic and osteopathy also have an ongoing tendency to be conceived as complementary healthcare. It is partly for this reason that physiotherapists work in public as well as private healthcare settings, while chiropractic and osteopathy work primarily in private healthcare.

Physiotherapists’ and Chiropractors’ Use of Patient-Reported Outcome Measures
The literature on physiotherapists’ and chiropractors’ use of PROMs has had a variety of foci to date. Some studies have taken a general approach to describe their use of PROMs in clinical practice, and others have focussed on describing their use for LBP. This may be because physiotherapists and chiropractors commonly consult for LBP (alongside neck pain). Only one study was identified on physiotherapists use of PROMs for chronic pain and chronic LBP. This study focussed on the correspondence between patient goals and PROMs in a single cohort, so cannot inform this discussion on the general extent that practitioners use PROMs for LBP.

Internationally, a great number of physiotherapists and chiropractors appear to use at least one PROM for LBP. In the Netherlands, 72.5% of all physiotherapists were observed using PROMs for non-specific LBP. In Australia, 72% of a non-representative sample of chiropractors reported that they use PROMs for LBP. Representatives from 17 of 19 chiropractic institutions (94.4%) in the United States also declared that they routinely use PROMs for LBP. This was said to mirror trends in the literature indicating an increasing use of PROMs by the chiropractic profession overall. Of the studies on practitioners’ use of PROMs for LBP, only one identified a relatively low extent of use among physiotherapists in New Zealand. This study cannot represent current practice as it was published before changes were made to the Accident Compensation Corporation’s third-party
payer regulations [208–210]. New Zealand physiotherapists can now be expected to have a greater overall extent of use due to their routine adoption of the Patient Specific Functional Scale and Numerical Pain Rating Scale for third-party payers [200].

Although physiotherapists and chiropractors probably use at least one PROM for LBP, they tend not to use more than a few measures. Osthols et al. [177] made this explicit when they observed that more than 85% of a representative sample of Swedish physiotherapists ‘never/seldom’ used most PROMs for patients with LBP. In other words, less than 15% of Swedish physiotherapists reported that they used most PROMs for LBP [177]. Some studies have estimated the average number of PROMs that practitioners use for patients with LBP by asking respondents directly. For example, Dutch physiotherapists reported that they use on average three measures for acute LBP [178]. Similarly, Saudi-Arabian physiotherapists reported that they often use 1-2 PROMs for LBP [175]. Other studies have indirectly indicated that approximately 2-3 PROMs tend to be used by describing those that are common among practitioners and institutions consulting for LBP [127,179].

Generally research suggests that physiotherapists and chiropractors use PROMs to assess the pain and disability (aka the burden) associated with LBP. Unidimensional pain scales—in particular, Numerical Pain Rating Scales [211–213] and Visual Analogue Scales [212]—have been identified as the most used PROMs for patients with LBP. Seven of eight studies quantifying use reported that pain scales were either the first or second most common PROMs among manual therapists or institutions consulting for LBP [127,175,177,179,202,203,214]. Disability-related PROMs have been found to be common among some manual therapists consulting for LBP, albeit to a lesser degree than pain scales. In the United States, the Oswestry Disability Index was reported as the most used PROM at Chiropractic Institutions [201]. The Oswestry Disability Index was also identified as among the most used disability-related PROM for other manual therapy populations [175,202,203]. Although Dutch physiotherapists have been found to use the Quebec Back Pain Disability Scale and the Patient Specific Complaints instrument in accordance with their national guidelines for non-specific LBP [127,171,178,214], manual therapists in other countries have made low use of these measures [175,202,203]. However, the Patient Specific Complaints instruments is similar to the Patient Specific Functional Scale, which has been shown to be more prevalent in other countries [175,177,215].

While physiotherapists and chiropractors may commonly use PROMs to assess the burden of LBP, several studies have indicated that they are rarely used to assess psychosocial factors [175–177,179]. More than 90% of Swedish physiotherapists reported that they “never/seldom” used PROMs to assess for fear avoidance, self-efficacy, depression, and anxiety [177]. Few Saudi-
Arabian physiotherapists reported that they used PROMs to assess psychosocial factors associated with LBP [175]. Only 5 of 18 American Chiropractic Institutions were identified using PROMs to assess psychosocial factors [179]. Although it is possible that practitioners still used multidimensional PROMs that included questions concerning psychosocial factors [179], full appraisal requires an investigation of each PROM that practitioners used and extends beyond the scope of this project.

Osteopaths’ Use of Patient-Reported Outcome Measures

As it stands, very little is known about osteopaths’ use of PROMs either in clinical practice or for LBP. One survey-based study was recently conducted on Australian osteopaths’ use of PROMs in clinical practice [93]. As part of this, the researchers asked about the extent of use for different regional conditions and found that 29% of respondents ‘always/frequently’ used PROMs for LBP. More respondents used PROMs for LBP and neck pain than for other conditions [93]. The focus was on regional conditions so no reference was made to chronic pain [93]. A greater number of osteopaths used PROMs for third-party payers (58%) than for private paying patients (11%), illustrating that extrinsic motivators were probably influential.

Australian osteopaths probably use PROMs to assess pain and disability more than psychosocial factors. According to the recent survey, nearly half of the respondents reported that they ‘frequently’ or ‘always’ used pain scales in clinical practice [93]; indicating that the measures may be common irrespective of whether the problem is LBP. The Oswestry Low Back Pain Disability Index was used by 48% of respondents as the most used PROM after pain scales [93]. The Patient-Specific Functional Scale was also used by 21% of respondents [93]. Australian osteopaths seem to make low use of PROMs to assess psychosocial factors as 14% of respondents used the Fear Avoidance Questionnaire, 12% used the Depression Anxiety Scale, and only 4% used the Hospital Anxiety and Depression Scale. These were the most used PROMs for psychosocial factors [93].

Determinants to Using Patient-Reported Outcome Measures

A significant body of work exists on barriers and facilitators to healthcare practitioners’ use of PROMs in clinical practice [54,173,184], and a growing portion of this is specific to physiotherapists [127,175,177,203,216,217], chiropractors [180,181], and osteopaths [93]. Barriers and facilitators can be thought of as potential determinants within the process of coming to use PROMs. Although the identification of barriers and facilitators does not necessarily ensure the successful implementation of a behaviour (e.g., PROMs’ use), findings can be used to inform the design of implementation strategies [173].
The Capabilities Opportunity Motivation – Behaviour (COM-B) system provides a means to synthesise findings on barriers and facilitators. According to this system, sufficient capability, opportunity, and motivation must be in place for any behaviour to occur. A preliminary distinction can be made between whether practitioners can or cannot use PROMs and whether they will or will not use PROMs. The former relates to the conditions of having sufficient capability and opportunity. The latter relies on having sufficient motivation. The COM-B system can be coupled with the Theoretical Domains Framework (TDF) for a more targeted analysis and synthesis of findings. The TDF categorises factors (independent variables) that may influence a targeted behaviour (dependent variable), with a particular focus on clinicians’ role in behaviour change. Both the COM-B and TDF have been described in detail in the ‘Methodology’ section of this thesis under ‘Theoretical Approach’.

**Capability**

Poor ‘knowledge’ has been identified as both a common and significant barrier to manual therapists’ use of PROMs internationally. Many respondents from non-representative samples of Australian osteopaths, Australian chiropractors, Swedish physiotherapists, Saudi-Arabian physiotherapists, and New Zealand physiotherapists have reported poor knowledge of PROMs. In contrast, 44% of Australian osteopaths claimed to have sufficient knowledge and confidence to use PROMs in clinical practice. A minority of Swedish physiotherapists also claimed that their knowledge was ‘good enough’.

Across the reviewed studies, respondents differed in their knowledge of the features and processes of using PROMs. Many Australian chiropractors reported that they lacked a preliminary understanding of PROMs and their applications. Many Australian osteopaths were also unfamiliar with the range of available PROMs. Some Swedish physiotherapists felt that they lacked the competency necessary to use PROMs. These physiotherapists lacked information and felt uncertain about sourcing information on how to select PROMs. For the Saudi-Arabian physiotherapists who felt comfortable selecting PROMs, it was still unclear how to identify the smallest amount of meaningful change for a patient (this is called the ‘minimum clinically important difference’). Most Australian osteopaths and some Swedish physiotherapists did not understand how to interpret this change in PROMs scores either.

The evidence is not definitive; however manual therapists’ knowledge of PROMs may be associated with specialisation (or a lack thereof). To date, PROMs use has been reported as strongly associated with both Master’s degree qualification and specialisation. Jette
et al. [223], for example, found that specialists were twice as likely to use outcome questionnaires (aka PROMs) than those who were not specialised. Although Brinkman et al. [127] found no significant difference in PROMs use between specialised and non-specialised therapists in the Netherlands, they suggested that this could be due to an overrepresentation of specialised therapists in their study population.

According to the COM-B and TDF, manual therapists’ capability to use PROMs relies on domains beyond conceptual knowledge. These may include ‘cognitive and interpersonal skills’, ‘physical skills’, ‘memory, attention, and decision processes’, and ‘behavioural regulation’ [224]. Given that few studies mentioned these other domains, it raises the question of whether the studies’ questionnaires and/or methods were sensitive to them.

**Opportunity**

Repeatedly, ‘time’ has been identified as both a prime resource and barrier to manual therapists’ use of PROMs in clinical practice [93,175–177,180,203]. In a survey of Australian osteopaths, over two-thirds (71%) of respondents agreed that PROMs were a burden on consultation time [93]. Almost two-thirds (60%) of Australian chiropractic respondents reported that PROMs were not used due to a lack of time [202]. Half (50%) of a sample of Saudi-Arabian physiotherapists agreed that their administration of PROMs was limited by time [175]. Across studies, manual therapists have found different aspects of PROMs’ administration to be time costly. Whereas Australian osteopaths and chiropractors had an issue with the time it took to apply and review PROMs [93,202], Swedish physiotherapists had an issue with the time it took to score PROMs and enter findings into clinical record systems online [176]. Additionally, a few Swedish physiotherapists claimed that patients did not wish to complete PROMs when they felt pressed for time, with the consequence being that they did not use them [176].

Practitioners seem to have made little mention of the physical and social factors affecting their opportunity to use PROMs. Some Australian osteopaths and Saudi-Arabian physiotherapists have problematised low organisational and peer support for limiting their use of the measures [93,175]. Low organisational support has been associated with poor administrative systems and the excessive time cost of using PROMs [173]. While digitisation has been recommended for the efficient use of PROMs [2,176,177,202], such initiatives have not been apparent in manual therapy contexts [177]. Taking a more social perspective, Swedish physiotherapists observed that language and cultural barriers limited their use of PROMs with some patients [177]. Saudi-Arabian physiotherapists also identified a lack of Arabic PROMs as a barrier [175].
**Motivation**

According to the COM-B system, motivation can be ‘reflective’ (e.g., self-aware planning and evaluations) or ‘automatic’ (e.g., impulses and reflex responses) \[218,219\]. Researchers have used a variety of terms to investigate physiotherapists’, chiropractors’, and osteopaths’ reflective motivation. They have investigated practitioners’ ‘attitudes’ and ‘beliefs’ regarding PROMs’ role in their clinical practice \[93,175\]. They have described the perceived ‘purpose(s)’ \[180\], ‘importance’ \[93\], ‘value’ \[178,225\], and ‘benefits’ \[93\] of PROMs, along with the perceived ‘advantages and disadvantages’ \[177\] of using PROMs in clinical practice. Many of these terms appear to relate to what other researchers have referred to as ‘practitioner theories’ of how PROMs work, whether they work, and what they achieve in clinical practice \[3\], making for a comprehensive discussion of practitioner knowledge and reflective motivation that exceeds the scope of this review.

Saudi-Arabian physiotherapists were said to have a positive attitude towards the use of PROMs for LBP \[175\]. A recent survey demonstrated that most physiotherapy respondents thought that PROMs should be used as primary outcome measures for patients with LBP \[175\]. Respondents indicated that this was the case for various domains including pain intensity, functional disability, psychosocial outcomes, and quality of life \[175\]. Compared with the findings for acute LBP, significantly more respondents (35.1% more) either agreed or strongly agreed that PROMs were important for the psychosocial assessment of chronic LBP. Marginally more respondents (16.2% more) also agreed or strongly agreed that PROMs were important for assessing the quality of life of patients with chronic LBP. Beyond these observations on domains, respondents also expanded upon their beliefs about pain assessment. Over three-quarters of the respondents maintained that pain assessment should be multidimensional rather than unidimensional; implying that assessment should extend beyond pain intensity to include pain quality and pain affect \[21\].

Although Swedish physiotherapists have described several advantages to using PROMs, it is unclear how many practitioners consider them valuable \[176,177\]. By association, it is unclear how many Swedish physiotherapists have a positive attitude towards PROMs. According to a recent survey, approximately 20% of physiotherapy respondents perceived that no benefit was gained from using PROMs for patients with LBP \[177\]. Although 100% respondents commented on their perceived barriers to using PROMs for LBP, only 64.2% described the advantages of using PROMs \[177\]. Another survey of Swedish physiotherapists demonstrated that most respondents had a positive attitude towards PROMs and were convinced of their advantages \[176\].
Evidence suggests that Australian chiropractors may hold PROMs in higher regard than Australian osteopaths. In a survey of Australian chiropractors, 87.2% of respondents considered PROMs either ‘very important’ or ‘somewhat important’ for practitioners at their clinic, and 76.6% of respondents felt PROMs were ‘important’ for the patient. Another study supported these findings by indicating that most Australian chiropractors thought PROMs were ‘somewhat important’ or ‘very important’ for practitioners, patients, and when planning treatment. In contrast with these findings, only 48% of osteopathic respondents agreed that PROMs were important for osteopathic practice. Although 61% of respondents agreed that PROMs were important for tracking clinical improvement, just over half of respondents (55%) reported that they would like to use PROMs more frequently.

Findings on Australian osteopaths can be clustered in such a way that they become easier to interpret and understand. As mentioned, Australian osteopaths were shown to primarily use PROMs for third-party payers (58%) and were most motivated by the requirements of third-party insurance schemes (82%). Osteopaths’ agreement (60%) that PROMs were important for tracking clinical improvement could relate to this, along with the widely held belief (59%) that PROMs provided objective indication of patient improvement. As the researchers themselves suggested, practitioners probably used PROMs to demonstrate effectiveness to third-party payers and therefore were most familiar with PROMs’ facility as monitoring tools. Contrasting these findings, osteopaths’ minimal use of PROMs for private patients (10%) could relate to their general low regard for PROMs’ value in their practice. This was evidenced by the low number of respondents who implemented PROMs as a useful adjunct to their osteopathic examination (35%), as a means to integrate care with other healthcare professionals (38%), and for perceived benefits in their management of patients (42%).

To conclude, a growing body of work exists on manual therapists’ and other healthcare practitioners’ use of PROMs in clinical practice. Despite this, little is known about New Zealand osteopaths’ use of the measures both in general and for specific conditions. PROMs’ purported benefits for the management of long-term conditions justifies an investigation of use with patients who have chronic LBP. The lack of understanding of osteopaths’ capability, opportunity, and motivation to use PROMs further justifies an exploration of use from the practitioner perspective.
Section Two: Methodology
Theoretical Approach

Although this study is not itself geared towards implementation, a theory and theory-based framework have been borrowed from implementation science to investigate barriers and facilitators to using PROMs in osteopathic care. Firstly, the Capability Opportunity Motivation - Behaviour (COM-B) system\(^{141,142}\) has informed the literature review and may further inform the analysis of findings regarding barriers and facilitators. Secondly, the Theoretical Domains Framework (TDF)\(^{143,144}\) has been incorporated into the design of the survey questionnaire. Both the COM-B and TDF are described with regard to their utility in the context of implementation science. Following this, the implications of borrowing from implementation science are discussed below.

COM-B

The COM-B system is both a model of behaviour and a starting point for the design of behaviour change interventions using the Behaviour Change Wheel \(^{218,219}\). The COM-B model outlines that three conditions need to be in place for any behaviour to occur: capability, opportunity, and motivation (Figure 1) \(^{218,219}\). Each of these conditions can be divided in two. Capability can be either ‘physical’ (e.g., skills, strength, stamina) or ‘psychological’ (e.g., knowledge, psychological skills, stamina). Opportunity can be ‘physical’ (e.g., time, triggers, resources) or ‘social’ (e.g., interpersonal influences, social cues, cultural norms). Motivation can be ‘reflective’ (e.g., self-aware planning and evaluations) or ‘automatic’ (e.g., impulses and reflect responses) \(^{218,219}\). These final reflective and automatic elements also map onto another theory called the PRIME Theory of Motivation: Plans, Responses, Impulses, Motives, and Evaluations \(^{219,226–228}\).

![Figure 1. The COM-B system: a framework for understanding behaviour](image)

---

\(^{141,142}\) Capability Opportunity Motivation - Behaviour (COM-B) system. \(^{143,144}\) Theoretical Domains Framework (TDF).
In addition to identifying the necessary conditions for a behaviour to occur, the COM-B system also presents interactions between these conditions and the behaviour (Figure 1). At the fore, the COM-B presents a bi-directional relationship between the conditions of behaviour and behaviour itself, implying that they are both under the influence of each other \[219,221,227\]. Whereas the COM-B introduces motivation as a key process for energising and directing a behaviour, motivation is also influenced by opportunity and capability \[221,227\]. It has been proposed that motivation may compel people to do things that increase their capability and opportunity to engage in a behaviour \[219\]. The present study construes these interactions at the level of the individual. It may be noted however that the COM-B can also be used to conceptualise behaviour at group, sub-population, and population levels \[219\]. In addition, in implementation research, the COM-B is often paired with a complimentary framework of theoretical domains called the Theoretical Domains Framework (TDF) (Figure 2) \[229–231\]. This pairing allows for more granular analyses of behaviour than the COM-B alone \[218,232\].

Figure 2: The COM-B and TDF as part of the Behaviour Change Wheel \[218\]

Theoretical Domains Framework
The TDF was initially developed to help researchers choose between myriad theories of behaviour change when designing behaviour change interventions \[221\]. Prior to its
development, researchers had recognised that the implementation of evidence-based practice depended upon behaviour change and that relevant theory could be useful in the design of interventions [219]. Despite this recognition, the large number of overlapping theories and lack of relevant methods produced challenges for their selection and use. The TDF was subsequently developed by a panel of psychologists and implementation scientists who synthesised constructs from psychological and organisational theories to facilitate theory selection [222]. As a ‘determinate framework’, the TDF describes factors (independent variables) that may influence a target behaviour (dependent variable) [221]. It is particular in its focus on the clinicians’ role in behaviour change [220–222]. Two versions of the TDF are currently available [222,224]. The most recent version categorises determinants into 14 different domains: social influences; environmental context and resources; emotion; reinforcement; goals; intentions; beliefs about consequences; optimism; beliefs about capabilities; social/professional role and identity; behavioural regulation; attention and decision processes; memory; skills; and knowledge [219,224].

**Purpose for Using the COM-B and Theoretical Domains Framework**

The COM-B and TDF were initially designed to support systematic analyses of ‘what needs to change’ when designing behaviour change interventions [219]. They are now advocated for use on the basis that researchers may otherwise make wrong assumptions about what needs to change [219,221]. Many examples exist of the TDF and/or COM-B being used for these purposes [229–231,233]. Most topically, Eilayyan et al. [131] used the TDF to design an intervention aimed at increasing primary care practitioners’ use of PROMs for chronic LBP. In contrast with these examples, this study has adopted the TDF and COM-B to investigate potential determinants to a behaviour prior to even considering behaviour change.

A key difference between this exploratory study and a well-designed implementation study is its approach to the behaviour of interest. In implementation science, guidelines unanimously recommend that researchers define a desired ‘target behaviour’ before looking to identify barriers and facilitators to behaviour change [219,234,235]. This study has focussed on a ‘problem behaviour’ rather than a target behaviour and has not yet aimed for behaviour change [235]. Whereas a target behaviour is specific in its elaboration of who does what differently, when, where, how and with whom, a problem behaviour is general through its association with a problem – in this case, chronic LBP [235]. Identification of a problem helps clinical diagnostics, but it does not reduce the heterogeneity of the PROM intervention and specify what osteopaths ‘should’ be doing when managing patients with chronic LBP. Identification of a
problem allows for investigation of the various ways that clinicians may be using PROMs for chronic LBP – hence, the descriptive and exploratory nature of this study.

Together, the TDF and COM-B provide coverage of factors that may affect clinicians’ behaviour. The TDF, in particular, provides comprehensive coverage of individual psychological and organisational factors influencing behaviour and behaviour change. Whereas a comprehensive approach is appropriate when coupled with a specific intervention and context for a focused effort at behaviour change, it appears less intuitive when combined with a heterogenous intervention that is cast across many different work settings as is currently the case. Acknowledging this, it was envisaged that the TDF could help yield an understanding of the relative importance of various domains (or determinants) as they pertain to osteopaths’ use of PROMs for chronic LBP. Rather than offer specific insights on factors that need to be changed within a specific context, the present study uses the TDF to identify factors that commonly affect the professions’ use of PROMs for chronic LBP. The TDF’s and COM-B’s capacity to limit the reinvention of existing concepts was thought useful for screening purposes. Their clarity and organisation were also thought useful for classifying responses to open-ended questions on the advantages/disadvantages of PROMs for chronic LBP.

Survey Research

The term ‘survey’ is commonly conceived as a method for collecting data. However, for methodological purposes, the term may be more comprehensively described as a research process geared towards the empirical and scientific investigation of people and social phenomena. As a process, a survey consists of several steps including the development of an overall design, representative sampling, questionnaire selection and/or design, and finally also questionnaire administration. The following section describes key considerations and decisions made for some of these steps.

Surveys are commonly contrasted as longitudinal or cross-sectional based on the number of times that they are administered for data collection. Longitudinal surveys are administered at several time-points and can be further differentiated into three types—panel studies, cohort studies, and trend studies—depending on the nature of their samples. Panel studies and cohort studies aim to uncover causal relationships by tracking variables across either the same or similar sets of respondents over time. Trend studies observe attitudinal or behavioural changes across dissimilar sets of respondents over time. In contrast with these designs, cross-sectional surveys are administered only once with a single set of
respondents within a short period of time \cite{242,243}. They have been said to produce a “snap-shot” of a population at a given point in time \cite{242,243}. Several cross-sectional surveys have been conducted to describe healthcare professionals’ (or professions’) use of PROMs in general and for LBP \cite{93,175,177,178,203}. Consequently, a cross-sectional design was thought appropriate for meeting the descriptive aims of this study. The economy and efficiency of a cross-sectional design were also attractive within the given constraints.

A defining feature of survey research is its capacity to describe the attributes of a large population based on findings from a smaller sample of that population \cite{244}. A survey’s sampling processes affect whether a sample can be seen to represent the wider population \cite{238}. A survey’s sample size and subsequent ‘power’ also affects the validity and reliability of its findings \cite{238}. For the purposes of this research, online calculators \cite{245,246} were used to calculate sample size. With a population of 540 osteopaths \cite{247}, a margin of error of 5-10%, and confidence levels of 90-95%, this was calculated to be between 61-225 respondents. In this study, a total of 79 respondents completed the survey questionnaire. This relatively low number of responses may be understood as part of a wide-spread decline in surveys’ response rates \cite{248}.

Declining response rates are a significant challenge for survey research as they threaten the integrity of random samples while also reducing their size \cite{238,240,248}. Low response rates are associated with non-response bias, which is a consequence of a systematic difference between those who choose to respond and those who do not \cite{240,249}. This affects the generalisability of findings. Low response rates and response bias appear to be particularly problematic for surveys of healthcare practitioners \cite{240,250}. Historically, online surveys of New Zealand osteopaths have had response rates between 20-40\% \cite{251–254}. Only one postal survey of New Zealand osteopaths reported a response rate over 40\% and this was with a concerted effort overall; for example, hand-written post-it notes were mailed with all questionnaires \cite{255}. Recently, Fleischman & Fryer\cite{126} deployed an online survey to investigate Australian osteopaths’ use of PROMs in clinical practice. Although they were unable to calculate a specific response rate, Fleischman & Fryer\cite{126} were able to acknowledge that their findings were underpowered, with the suggestion that PROMs may be of little interest to the Australian osteopathic profession overall.

In survey research, the collection of valid and reliable information relies upon the use of either a well-written interview schedule or a questionnaire \cite{238}. Interview schedules have a long history of guiding face-to-face and telephone interviews \cite{238,256}. Self-administered questionnaires are increasingly popular with a range of distribution options online and via the
post [238,256]. Whereas each distribution method brings its own advantages and disadvantages, the key considerations for this study were their resource requirements and capacity to facilitate a reasonable response rate [238,256]. Self-administered questionnaires were preferred as the most efficient means of collecting information from large populations and/or samples [238,240,256]. Although face-to-face interviews have been shown to produce good response rates [248], they are resource-intensive and so were not feasible for this project.

Two strategies were implemented to increase the response rate for this study. Firstly, the survey was piloted to a diverse group of osteopaths to assess face validity [240]. Secondly, an Expression of Interest form (Appendix B) was completed with the Osteopathy Research Connect New Zealand (ORC-NZ) project to recruit from its Practice-Based Research Network (this is a network comprised of New Zealand osteopaths who have voluntarily self-selected for participation in research) [81]. It was hypothesised that combined recruitment via the Osteopaths New Zealand and the ORC-NZ project could legitimise the study in the eyes of potential participants and thereby increase the number of responses.

Web-based questionnaires are the most common mode of survey distribution for good reason. Online surveys offer efficient communications that can be delivered across multiple platforms including email, social media, blogs, webpages, and newsletters [238]. Software platforms like SurveyMonkey® (CA, USA) facilitate sophisticated survey design that, on the front end, can be both graphical and interactive [241]. Software platforms may facilitate more accurate responses than interviews and pen-and-paper questionnaires. Instant coding may allow such platforms to eliminate errors associated with manual data entry [238]. Their interactive capacities also reduce the response-burden of navigating through the survey. As platforms can guide respondents through a questionnaire, there is less risk of questions being answered out of order. Respondents’ answers may otherwise be primed by knowledge of questions later in the questionnaire [238]. Together these considerations led to the use of SurveyMonkey® (CA, USA) in the present study.

**Questionnaire Development**

Four questionnaires [177,202,203,217] were initially reviewed when sourcing and adapting a questionnaire for this study. These questionnaires varied in the extent that they focussed on either describing practitioners’ use of PROMs and/or the potential determinants to such use for LBP. While two questionnaires [133,138] contrasted physiotherapists’ use of clinical outcomes assessment with PROMs assessment, another questionnaire [136] honed-in on chiropractors’ use of PROMs for LBP. All four questionnaires included items investigating potential barriers
and facilitators to the use of PROMs for LBP, with one study\textsuperscript{131} focussed exclusively on the topic.

Beyond their diverse topics, variations were also identifiable within shared topics. For example, two questionnaires\textsuperscript{[177,203]} investigated physiotherapists’ use of outcome measures yet differed in the level of detail that they gave to describing PROMs for LBP. While one questionnaire\textsuperscript{[203]} listed six common PROMs and invited respondents to add others that they use, another questionnaire\textsuperscript{[177]} provided several lists of PROMs across different domains (pain, function, quality of life, fear of movement, screening for yellow flags, anxiety and depression). As may be anticipated, the number and design of items given to barriers and facilitators varied considerably. Some questionnaires\textsuperscript{[177,202]} investigated barriers and facilitators with cursory open-ended questions, while other questionnaires\textsuperscript{[203,217]} listed a series of theory-based items along 5- or 6-point Likert scales. These items were ‘theory-based’ because they were developed using either a theoretical framework or theory generated through qualitative research.

To improve survey quality, it is often advised that researchers make use of established and validated questionnaires. Researchers are encouraged to take a methodical approach towards item development if such tools are not available\textsuperscript{[257]}. In compiling the survey questionnaire, three TDF-based questionnaires\textsuperscript{[217,258,259]} were reviewed for their use of validated items and comprehensiveness overall. They were selected for their capacity to identify potential determinants—or barriers and facilitators—needing further investigation. Although some authors had explored barriers and facilitators through the use of focus groups and interviews\textsuperscript{[180,203]}, modification of existing TDF-based questionnaires appeared to be the less resource-intensive option\textsuperscript{[224]}. In addition to this, items were selected from Osthol et al.\textsuperscript{[177]} and Copeland\textsuperscript{[203]} to describe practitioners’ use of PROMs.

\textit{Survey Instrument}

A self-report questionnaire consisting of four parts (Qualifying Questions; Demographic Information; Extent of PROMs Use; Barriers and Facilitators to PROMs Use) was created for use in this study (Appendix B). The questionnaire includes short-answer, open-ended, and closed-ended questions utilising 5 and 6-point Likert Scales.

In order to investigate the extent that osteopaths use PROMs, the third part of the questionnaire was initially designed to quantify the frequency that osteopaths use common PROMs for LBP\textsuperscript{[177,203]}. A list of ‘common’ PROMs was determined through a preliminary scope of the literature, which included relevant surveys\textsuperscript{[177,202,203]} and articles on selecting
appropriate outcome measures for patients’ LBP (49–54). Following one questionnaire [177] and the decision to focus on chronic LBP, an additional PROM was added to encompass ‘fear of movement’.

Investigating barriers and facilitators, the fourth part of the questionnaire was adapted from a close reading of three TDF-based questionnaires [217,258,259]. The sheer number of TDF constructs and items included in these questionnaires led to an extended effort to balance efficiency with comprehensiveness. Any repetitive and/or seemingly redundant items were deleted. Care was also taken to ensure that each TDF domain was preserved with at least one item per domain. Emphasis was given to the perceived advantages and disadvantages of PROMs due to their predominance among various questionnaires [177,217]. This was achieved through the use of open-ended questions. Given that only two of the three questionnaires on barriers and facilitators [258,259] were validated, all items were checked against their example.

**Pilot Testing**

Pilot testing can help identify areas of a questionnaire that are in need of revision and has the potential to improve completion rates [256]. For these reasons, the modified questionnaire (Appendix B) was formatted and hosted on a commercial survey platform (SurveyMonkey®, CA, USA) for pilot testing with five osteopaths who claimed to have varied experiences using and not using PROMs. All participants were asked 1) to time themselves to estimate how long it took them to complete the questionnaire, 2) to highlight areas that seemed unnecessarily long, and 3) to identify errors, gaps, or ambiguous items. As the first few participants had little to say about the questionnaire, a feedback form (Appendix D) was introduced to encourage more in-depth reflections. Participants’ feedback was appraised so that the questionnaire could be revised accordingly.

Several small changes were made to the survey questionnaire based on participants’ feedback. The placement of the terms ‘strongly agree’ and ‘strongly disagree’ was swapped for a more intuitive response to questions 15 to 31. The phrase ‘teaching in university settings’ was replaced with ‘lecturing at tertiary institutions’ to better reflect the educational environments in which osteopaths are trained (question 10). Efforts were made to ensure that that only one box could be ticked for relevant closed-ended questions (e.g., questions 4 and 9). Although one participant observed that there could be more investigation of osteopaths’ training around PROMs and the influence of the patient on practitioners’ attitudes towards the same, their feedback was parked for brevity. Given the length of the questionnaire and the fact that there were questions regarding practitioners’ self-perceived knowledge and skills,
questions on training were not thought essential. Patient-related factors were thought to be relatable via the open-ended questions on the perceived advantages and disadvantages of using PROMs (questions 31 and 32).

A few items were added to the survey questionnaire after the pilot was complete. Recognition of the heterogeneity of the PROMs intervention led to question 14 ‘Please rate the frequency that you use PROMs for the following applications with patients experiencing chronic LBP’ being added to the questionnaire. This was adopted from another questionnaire [264]. During data collection, one respondent mentioned “It’s difficult to answer these questions as I have mostly used PROM at Unitec clinical training”. Another respondent answered “I have never used them and therefore have no opinion. Also, questions 15-30 are difficult to answer as I have no experience of using PROM with any of my patients.” These observations resulted in skip-logic being added with the suggestion that respondents skip to the final question if they never used PROMs for chronic LBP. This final question was added as an open-ended question asking ‘what prevents you from using PROMs in the management of patients with chronic LBP?’ At the time that these changes were made, 44 respondents had already responded to the survey.

Data Analysis
The descriptive aims of this study led to analytic methods being selected for their ability to describe and ‘stay close’ to the survey data. Descriptive statistics—e.g., frequency distributions, percentages, means, and standard deviations—were first identified as appropriate for analysing all categorical and continuous data. Qualitative descriptive research was then investigated for methods that would help organise and make sense of the textual data [265]. Content analysis was adopted for its ability to remain at the level of manifest as opposed to latent data, and for its capacity to include frequencies as a rough proxy for a category’s significance [265,266]. Notably, content analysis was also adopted as a method to manage textual data rather than as part of a comprehensive qualitative research paradigm. Two other survey-based studies [177,217] had already used content analysis on similar open-ended questions at the time that this study was designed.

Summary
In summary, a cross-sectional survey-based design was chosen to meet the aims of this study within its given constraints. At the time that it was designed, several cross-sectional surveys had already been conducted for similar purposes [93,175,177,178,203]. Other attractive features included the efficiency and economy of online distribution [238]. Platforms like Survey Monkey®
(CA, USA) also offered instant coding and a graphical nature when hosting the survey [238,241]. Given surveys’ relatively high risk of a low response rate, the survey questionnaire was piloted to assess face validity and recruitment was expanded to include a pool of self-selecting osteopaths who were interested in research [81].

To develop the survey questionnaire, five questionnaires [177,203,217,258,259] were combined and adapted for use in this study. Three TDF-based questionnaires [217,258,259] were first identified to guide item-selection on barriers and facilitators to osteopaths’ use of PROMs. Two other questionnaires [177,203] were reviewed for their items describing practitioners’ use of PROMs for LBP. Although this study is not an implementation study, it was envisaged that TDF could help yield an understanding of the relative importance of various domains as they pertain to osteopaths’ use of PROMs for chronic LBP. Further detail on study methods has been provided in this thesis’s ‘Manuscript’ section.
References


11. Field J, Holmes MM, Newell D. PROMs data: can it be used to make decisions for


23. Vaughan B, DiVenuto G. An introduction to the use of outcomes questionnaires in

24. Meaningful Measures. Measure Yourself Medical Outcomes Profile [Internet]. 2021 [cited 2022 May 5];Available from: https://www.meaningfulmeasures.co.uk/mymop

25. The Patient Specific Functional Scale.


29. Mapi Research Trust. PROQOLID. 2022;


51. German PS, Shapiro S, Skinner EA, Michael ;, Korff V, Klein LE, et al. Detection and


90. Fawkes C. The development, evaluation, and initial implementation of a national programme for the use and collation of patient reported outcome measures (PROMs) in osteopathic back pain services in the UK [PhD]. United Kingdom: Barts and the London Queen Mary's School of Medicine and Dentistry; 2016. Available from: https://qmro.qmul.ac.uk/xmlui/handle/123456789/29606


Ministry of Health; 2020.


189. Engel RM, Brown BT, Swain MS, Lystad RP. The provision of chiropractic, physiotherapy and osteopathic services within the Australian private health-care system: a report of recent trends [Internet]. 2014 [cited 2023 Apr 23]. Available from: http://www.chiromt.com/content/22/1/3


197. Grace S, Engel R, Jalsion I. Themes Underlying Australian General Practitioner Views


224. Cane J, O’connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research [Internet]. 2012 [cited 2023 Apr 24];7:37. Available from: http://www.implementationscience.com/content/7/1/37


231. De Leo A, Bayes S, Bloxsome D, Butt J. Exploring the usability of the COM-B model
and Theoretical Domains Framework (TDF) to define the helpers of and hindrances to evidence-based practice in midwifery. Implement Sci Commun. 2021;2(1).


244. Joye D, Wolf C, Smith TW, Fu Y chih. Survey Methodology: Challenges and


253. Blaser P. New Zealand Osteopaths’ Attitudes to ‘Evidence-Based Practice’- Development of a Questionnaire and Preliminary Results [Masters]. Auckland: Unitec Institute of Technology; 2009.


258. Huijg JM, Gebhardt WA, Dusseldorp E, Verheijden MW, van der Zouwe N, Middelkoop BJC, et al. Measuring determinants of implementation behavior:
Psychometric properties of a questionnaire based on the theoretical domains framework. Implement Sci. 2014;9(1).


Section Three: Manuscript

Note to the reader: This manuscript has been prepared according to the guidelines for the International Journal of Osteopathic Medicine, available in Appendix A and here: https://www.elsevier.com/wps/find/journaldescription.cws_home/705245?generatepdf=true
New Zealand Osteopaths’ Use of Patient-Reported Outcome Measures with Patients who have Chronic Low Back Pain: A Cross-Sectional Survey

Evania VALLYON¹, Samantha HEATH², Saeideh AMINIAN¹
¹ Department of Osteopathy, Unitec Institute of Technology, Auckland, New Zealand
² Department of Nursing, Unitec Institute of Technology, Auckland, New Zealand

Running Head: New Zealand Osteopaths’ Use of Patient-Reported Outcome Measures for Chronic Low Back Pain

Acknowledgements: The researchers extend their gratitude to the survey respondents who contributed to this research, and further thank the teams at Osteopaths New Zealand and Osteopathic Research Connect–New Zealand for their help in recruitment.

Funding Statement: This research has been funded by the school of community studies Unitec Institute of Technology.

Corresponding Author:
Evania Vallyon, Master of Osteopathy,
Unitec Institute of Technology,
Private Bag 92025 Auckland Mail Centre,
Auckland 1142, New Zealand
[T] +64-210471510
[E] evallyon@runbox.com
Abstract

**Background and Aims:** Patient-Reported Outcome Measures (PROMs) are instruments that capture patients’ perspectives of their own health status and quality of life. As part of rising advocacy for their use in clinical practice, PROMs are said to hold promise for the management of long-term conditions. This study aimed to describe and explore New Zealand osteopaths’ use of PROMs for patients with chronic low back pain.

**Methods:** An online survey was adapted to investigate New Zealand osteopaths’ use of PROMs with patients who have chronic LBP. Topics included frequency of use, purposes for use, and determinants to use. Respondents were recruited via anonymous and non-randomised sampling across multiple platforms. Frequencies, means, and standard deviations were calculated for all numerical data. Content analysis was used to analyse textual data on the determinants to use.

**Results:** In total, 79 osteopaths were included in data analysis. These respondents most often used PROMs to monitor patients’ pain intensity (80%) and sometimes also functional disability (27%). Although the respondents had some regard for their capability to use PROMs, they also claimed to be constrained by limited time and social or professional norms. Respondents were more attentive to the consequences of PROMs for patients than for other stakeholders.

**Conclusions:** Although New Zealand osteopaths may use PROMs to monitor the burden of chronic LBP, they probably do not use PROMs for the multidimensional assessment of pain or psychosocial factors. New Zealand osteopaths may be most receptive to adopting PROMs if they are presented with relevant interventions and evidence of their benefits for patients.

**Keywords:** Patient-Reported Outcome Measures; osteopathic medicine; chronic low back pain; barriers and facilitators; cross-sectional survey
Introduction

Patient-Reported Outcome Measures (PROMs) are instruments that capture patients’ assessments of their own health status without interpretation by a clinician or anyone else [1]. Having first been developed for use in research and then adopted for aggregate outcomes measurement to inform funding and policy decisions [2], there is now increasing interest in the use of individual PROM feedback in clinical practice [3–6]. Fleischmann and Vaughan [3,7,8] recently advocated for the widespread collection of both aggregate and individual PROMs data in osteopathic practice. This study responds to this call by investigating osteopaths’ use of the measures at an individual level.

After more than 30 years of development, there are now a multitude of PROMs available [9]. A leading database reports that it holds 2300 ‘Clinical Outcome Assessments’ of which PROMs probably form a substantial part [4,10]. Standardised questionnaires continue to be the most longstanding and common form of PROMs [4,9], and these are often described as generic or specific based on the breadth of their constructs and target populations. Recent efforts to incorporate individual PROM data into patient management have motivated the development of other instruments that reflect or respond to the patient as an individual [4,11–14]. These include individualised and computer adaptive PROMs [4].

There are several reasons why a clinician may choose to use individual PROMs in their clinical practice. Greenhalgh et al. [9] recently determined that the use of individual PROMs has been intended “to improve the detection of patient problems, to support clinical decision making about treatment through ongoing monitoring, and to empower patients to become more involved in their care” [9](p.1). These proposals suggest that PROMs may be beneficial for the patient-centred management of long-term conditions, such as chronic low back pain (LBP) [15,16]. Although the literature is challenging due to the complexity of the intervention and subsequent heterogeneity between studies, systematic reviews provide some indication that the feedback of individual PROMs data probably impacts processes more than outcomes of care [4,9,17,18]. A recent Cochrane Review [18] (116 randomised trials; 49,785 participants) found that feedback probably leads to a moderate increase in patient-physician communication, diagnoses, and notation, along with probable improvements in disease control.

Despite the potential benefits of using individual PROMs in clinical practice, healthcare practitioners have been slow to adopt them on a routine basis [19,20,29–31,21–28]. Practitioners have resisted the measures based on the beliefs that PROMs are not practical nor feasible in clinical practice; that PROMs’ psychometric properties do not support their use at an individual
level; and that PROMs may constrain rather than support the patient-practitioner relationship [9]. To date, research on manual therapists has most often investigated ‘barriers and facilitators’ to help explain their use of PROMs in clinical practice. Many manual therapists have reported poor knowledge and a lack of time as prime barriers to use [19,23,25,32–34]. Manual therapists have also expressed mixed attitudes towards using the measures [19,23,32,33].

Apart from one survey-based study on Australian osteopaths [32], very little is known about osteopaths’ use of individual PROMs in clinical practice. This study aimed to address this gap by describing New Zealand osteopaths’ use of PROMs with patients who have chronic LBP. This study further aimed to explore potential barriers and facilitators that may influence future implementation. Furthermore, preliminary efforts were made to understand the perceived advantages of using the measures.

Methods

Design
A cross-sectional survey-based design was selected to investigate New Zealand osteopaths’ use of PROMs with patients experiencing chronic LBP. This design was appropriate for the aims of the study as it could be used to scientifically investigate self-reported behaviours, perspectives, and attitudes [35]. There are many examples of cross-sectional surveys being used to investigate other healthcare practitioners’ use and attitudes towards PROMs [19,21,23,25,32].

Participants and Recruitment
Osteopaths were eligible to participate in this study if they met three criteria: 1) they carried a current Annual Practicing Certificate with the Osteopathic Council of New Zealand (OCNZ), 2) they consulted for chronic LBP on a regular basis, and 3) they had practiced in New Zealand for at least two years [23]. As the population was 540 osteopaths at the time of recruitment, it was estimated that a minimum of 61 respondents would be required for a 10% margin of error [36,37].

Ethical Considerations
Participants were provided with a ‘Participant Information Sheet (Appendix C) at the start of each survey to inform them that their submission of a response would imply their consent. Participants were informed that their anonymity would be protected as neither IP addresses nor any other personally identifiable data was stored [38]. All gathered information was stored on a password-protected laptop and backed up on cloud storage with end-to-end encryption.
[39,40]. Only the researcher and research supervisors had access to this data. This research was approved by the Unitec Research Ethics Committee (Registration Number: 2021-1019; Appendix E).

Survey Instrument

A self-report questionnaire was created for use in this study (Appendix B). Items were selected and adapted from six other questionnaires [13,23,25,41–43], three of which were based on the Theoretical Domains Framework (TDF) [41,41,42]. The draft questionnaire was formatted and hosted on a commercial survey platform (SurveyMonkey®, CA, USA) for pilot testing with five osteopaths who claimed to have varied experiences using PROMs. Feedback resulted in changes being made to the wording and response-settings for some items.

The finalised questionnaire consisted of four parts: Eligibility Questions; Demographic Information; Use of PROMs; and Barriers and Facilitators. Whereas the questionnaire was primarily comprised of closed-ended questions that utilised both 6-point Likert Scales and sliders between ‘strongly disagree’ (0) and ‘strongly agree’ (100), further information was sought through the use of short-answer and open-ended questions. Particular focus was given to the respondents’ reflective motivation with two open-ended questions on the perceived advantages and disadvantages of using the measures. The survey was estimated to take approximately 10-15 minutes to complete.

Data Collection

Several strategies were used to recruit participants for this survey. Survey invitations and links were sent to Osteopaths New Zealand (ONZ) for emailing to members and for posting under the ‘classified’ section on their website. Survey invitations and links were also sent to a national practice-based research network via the Osteopathic Research Connect New Zealand (ORC-NZ) project [44]. Invitations and links were posted on the feeds of various osteopathy groups on Facebook. Facebook was then used to direct message prior classmates who were working as osteopaths, with both an invitation to complete the survey and a request that they pass it on to their colleagues. Data collection lasted for approximately 12 weeks, from 23 August 2021 to 16 November 2021. Both ONZ and ORC-NZ sent a reminder email within the month following their initial invitation.

Data Analysis

Survey data was exported from SurveyMonkey® and downloaded to a Microsoft Excel spreadsheet for data cleaning. Respondents were immediately excluded if they answered ‘no’
to any of the eligibility questions \((n = 13)\) or had over 75% of data missing \((n = 7)\). The remaining responses were excluded from a single data set of they had missing data.

A Microsoft Excel spreadsheet was used to calculate frequency distributions and percentages for all Likert-scale data. Means and standard deviations were calculated for the closed-ended questions on barriers and facilitators. Although these questions initially generated continuous data between strongly disagree (0) and strongly agree (100), the data was subsequently divided into five categories. The was to create a figure that better visualised the data (Figure 4). ‘Barriers’ and ‘facilitators’ were respectively defined as items that had under 60% of respondents answering “strongly disagree/ disagree/ neutral” and “strongly agree/ agree” \([11]\).

A variation of content analysis was used to analyse responses to the open-ended questions. Most responses were very short, so categories and sub-categories were used to generate frequencies. Where possible, analysis was done in accordance with the Capability Opportunity Motivation – Behaviour system (COM-B) \([45,46]\) and TDF \([46,47]\). The COM-B system basically determines that sufficient capability, opportunity, and motivation must be in place for any behaviour to occur. The TDF categorises factors that may influence a targeted behaviour, with a particular focus on clinicians’ role in behaviour change \([48–50]\).

**Results**

Of the 79 respondents who completed most of the survey (Table 1), 58 respondents answered the closed-ended questions on barriers and facilitators. Fewer respondents completed the open-ended questions on the advantages \((n = 40)\) and barriers \((n = 47)\) to using PROMs for chronic LBP.

Demographically, the majority of respondents had Masters’ degrees followed by Bachelors’ degrees. Only one respondent carried an extended scope of practice in Pain Management, which would theoretically affect their knowledge of managing chronic pain. Only a small number of respondents were members of the ORC-NZ practice-based research network, having previously volunteered to participate in research.
### Table 1. Characteristics of survey respondents (n = 79)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age bracket</strong></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>7 (8.86)</td>
</tr>
<tr>
<td>30-39</td>
<td>15 (18.99)</td>
</tr>
<tr>
<td>40-49</td>
<td>28 (35.44)</td>
</tr>
<tr>
<td>50-59</td>
<td>15 (18.99)</td>
</tr>
<tr>
<td>60+</td>
<td>14 (17.72)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>39 (49.37)</td>
</tr>
<tr>
<td>Female</td>
<td>35 (44.30)</td>
</tr>
<tr>
<td>Fluid</td>
<td>1 (1.27)</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>4 (5.08)</td>
</tr>
<tr>
<td><strong>Highest qualification</strong></td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>9 (11.39)</td>
</tr>
<tr>
<td>Bachelor’s (or Double Bachelor’s) degree</td>
<td>22 (27.85)</td>
</tr>
<tr>
<td>Postgraduate certificate or diploma</td>
<td>7 (8.86)</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>39 (49.37)</td>
</tr>
<tr>
<td>Doctorate</td>
<td>2 (2.53)</td>
</tr>
<tr>
<td><strong>Years in practice</strong></td>
<td></td>
</tr>
<tr>
<td>2-5</td>
<td>17 (21.52)</td>
</tr>
<tr>
<td>6-10</td>
<td>11 (13.92)</td>
</tr>
<tr>
<td>11-15</td>
<td>10 (12.66)</td>
</tr>
<tr>
<td>15-20</td>
<td>11 (13.92)</td>
</tr>
<tr>
<td>&gt;20</td>
<td>30 (37.97)</td>
</tr>
<tr>
<td><strong>Other scope(s) of practice</strong></td>
<td></td>
</tr>
<tr>
<td>Pain Management</td>
<td>1 (1.27)</td>
</tr>
<tr>
<td>Western Medical Acupuncture</td>
<td>8 (10.13)</td>
</tr>
<tr>
<td>Child and Adolescent Health</td>
<td>7 (8.86)</td>
</tr>
<tr>
<td><strong>Other occupational roles or memberships</strong></td>
<td></td>
</tr>
<tr>
<td>Lecturing at tertiary institutions</td>
<td>4 (5.06)</td>
</tr>
<tr>
<td>Clinical supervision of students</td>
<td>3 (3.80)</td>
</tr>
<tr>
<td>Clinical supervision of associates</td>
<td>14 (17.72)</td>
</tr>
<tr>
<td>Supervision of research students</td>
<td>1 (1.27)</td>
</tr>
<tr>
<td>Research</td>
<td>5 (6.33)</td>
</tr>
<tr>
<td>OCNZ preceptor</td>
<td>3 (3.80)</td>
</tr>
<tr>
<td>ORC-NZ member</td>
<td>21 (26.58)</td>
</tr>
<tr>
<td>ONZ member</td>
<td>53 (67.09)</td>
</tr>
</tbody>
</table>

Abbreviations: n = number; ONZ = Osteopaths New Zealand; OCNZ = Osteopathic Council of New Zealand; ORC-NZ PBRN = Osteopathy Research Connect New Zealand Practice Based Research Network
Frequency of PROMs’ Use and Applications for Chronic Low Back Pain

In total, 79.5% of the respondents (n = 63) reported that they ‘often’ to ‘always’ used pain scales for chronic LBP. In contrast, 34.18% of respondents (n = 27) ‘often’ to ‘always’ used other PROMs than pain scales. Most respondents who used these other PROMs also used pain scales, as demonstrated by the close value between ‘Pain Scales’ and ‘Pain Scales or Other PROMs’ in Figure 1. Only one respondent contradicted this pattern by making exclusive and frequent use of the Patient-Specific Functional Scale (PSFS).

As per Figure 2, the most used pain scale was the Numeric Pain Rating Scale (NPRS) (74.68%), however, some osteopaths also used the Visual Analogue Scale (VAS) (42.3%). Approximately one-fifth of the respondents (20.37%) used the PSFS. But for the Oswestry Disability Index (ODI) (6.33%), all other PROMs were used by less than 5% of the respondents and many were used by only a single respondent (1.27%). One respondent used different PROMs than all other respondents to triage patients for Accident Compensation Corporation (ACC) coverage under the Pain Management Services Contract [51,52]. Where respondents indicated outcome measures that were not PROMs, comments were excluded from the analysis.

![Figure 1. Frequency of PROMs' use with patients (n = 79)
Chart illustrates the percentage of combined 'often', 'very often' or 'always' responses for at least one pain scale or other PROMs. Abbreviation: PROM = Patient-Reported Outcome Measure](image-url)
Figure 2. Frequency of specific PROMs’ use with patients (n = 79)
Chart illustrates the percentage of combined ‘often’, ‘very often’, or ‘always’ responses. Abbreviation: PROM = Patient-Reported Outcome Measure
The respondents reported using PROMs for a wide range of applications including monitoring, communication, screening, personalised care planning, and self-management (Figure 3). There was a slight lead on their use of PROMs for monitoring chronic LBP (78.47%), however the difference in frequency for this application and the other applications was small. Describing other applications, one respondent indicated that they used PROMs to aid the “therapeutic atmosphere” and another respondent reported that they used PROMs to facilitate communication with ACC.

![Figure 3. Frequency of PROMs’ applications with patients (n = 79)](chart.png)

Chart illustrates the percentage of combined ‘often’, ‘very often’, and ‘always’ responses. Abbreviation: PROM = Patient Reported Outcome Measure

Determinants to Using PROMs with Patients who have Chronic Low Back Pain
Table 2 lists the medians and interquartile ranges (IQR) that were calculated for the closed-ended questions on barriers and facilitators. The items with means closest to ‘strongly agree’ often related to practitioners’ self-perceived capability to use PROMs. On a scale of 0-100 (0 = strongly disagree; 100 = strongly agree), there was an median of 77 (IQR = 25) for having the skills to use PROMs in the management of chronic LBP. In close stead, there was an median of 76 (IQR = 41) for being familiar with the objectives of using PROMs and a median of 70 (IQR = 41) for knowing how to apply PROMs. This was then supported by respondents’ beliefs in their capabilities, with an median of 74 (IQR = 37) for being confident they could use PROMs.
<table>
<thead>
<tr>
<th>COM-B</th>
<th>TDF Domain</th>
<th>Statement* (0 = strongly disagree, 100 = strongly agree)</th>
<th>M</th>
<th>IQR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability</td>
<td>Skills</td>
<td>I have the skills to use PROMs in the management of CLBP</td>
<td>77</td>
<td>40</td>
</tr>
<tr>
<td>Capability</td>
<td>Knowledge</td>
<td>I am familiar with the objectives of using PROMs in the management of CLBP</td>
<td>76</td>
<td>41</td>
</tr>
<tr>
<td>Opportunity</td>
<td>Resources</td>
<td>The resources that I need to use PROMs in the management of CLBP are available</td>
<td>75</td>
<td>49</td>
</tr>
<tr>
<td>Motivation</td>
<td>Beliefs</td>
<td>I am confident that I can use PROMs in the management of CLBP</td>
<td>74</td>
<td>37</td>
</tr>
<tr>
<td>Motivation</td>
<td>Intentions</td>
<td>I have a strong intention to use PROMs in the management of CLBP</td>
<td>73</td>
<td>44</td>
</tr>
<tr>
<td>Capability</td>
<td>Knowledge</td>
<td>I know how to apply PROMs in the management of CLBP</td>
<td>70</td>
<td>41</td>
</tr>
<tr>
<td>Motivation</td>
<td>Beliefs</td>
<td>Using PROMs in the management of CLBP is useful and has many advantages for patients</td>
<td>70</td>
<td>41</td>
</tr>
<tr>
<td>Motivation</td>
<td>Emotions</td>
<td>I generally feel comfortable using PROMs in the management of CLBP</td>
<td>68</td>
<td>27</td>
</tr>
<tr>
<td>Motivation</td>
<td>Optimism</td>
<td>With regards to using PROMs in the management of CLBP, I feel optimistic about the benefits for patients</td>
<td>65</td>
<td>37</td>
</tr>
<tr>
<td>Opportunity</td>
<td>Resources</td>
<td>There is enough time to use PROMs in the management of CLBP</td>
<td>64</td>
<td>62</td>
</tr>
<tr>
<td>Motivation</td>
<td>Goals</td>
<td>I have a clear plan for how I will use PROMs in the management of CLBP</td>
<td>61</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>N. Behaviour</td>
<td>Using PROMs in the management of CLBP is something that I do automatically</td>
<td>60</td>
<td>67</td>
</tr>
<tr>
<td>Motivation</td>
<td>Prof. Identity</td>
<td>It is my responsibility as an osteopath to use PROMs in the management of CLBP</td>
<td>60</td>
<td>62</td>
</tr>
<tr>
<td>Motivation</td>
<td>Reinforcement</td>
<td>Whenever I use PROMs in the management of CLBP, I feel like I am making a difference</td>
<td>54</td>
<td>49</td>
</tr>
<tr>
<td>Opportunity</td>
<td>Social influences</td>
<td>Many healthcare practitioners whose opinion I value think that I should use PROMs in the management of CLBP</td>
<td>50</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>N. Behaviour</td>
<td>I often forget to use PROMs in the management of CLBP</td>
<td>30</td>
<td>36</td>
</tr>
</tbody>
</table>

Abbreviations: COM-B = Capabilities Opportunity Motivation – Behaviour; TDF = Theoretical Domains Framework; M = Median; IQR = Interquartile Range; PROMs = Patient-Reported Outcome Measures; Prof. = Professional; N. Behaviour = Nature of the Behaviour; CLBP = chronic low back pain
No single COM-B component was indicated on the opposite end of the spectrum. The items that were closest to ‘strongly disagree’ related to the TDF domains ‘nature of the behaviour’ and ‘social influence’, which is part of the ‘opportunity’ component in the COM-B system. Regarding the ‘nature of behaviour’, there was an median of 30 (IQR = 36) for the statement ‘I often forget to use PROMs in the management of chronic LBP’. Notably, this was the sole reverse-scored item where a lower rating is not associated with being a barrier. Respondents indicated an median of 50 (IQR = 28) for the idea that valued colleagues thought they should use PROMs, thereby raising its potential as a barrier.

Responses to the closed-ended questions on barriers and facilitators are illustrated in Figure 4, with shading providing an easy way to grasp the degree to which respondents either agreed or disagreed with each statement. Only the final item had over 60% coverage of the categories ‘strongly disagree’, ‘disagree’, and ‘neutral’. Although potential facilitators were numerous (Table 3), most items fell within a range of 60-69% of ‘strongly agree’ and ‘agree’. Only three items were more strongly indicated at over 70%.

Table 3. Facilitators to respondents’ use of PROMs with patients (n = 58)

<table>
<thead>
<tr>
<th>COM-B Component</th>
<th>TDF Domain</th>
<th>Statement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability</td>
<td>Knowledge</td>
<td>I am familiar with the objectives of using PROMs in the management of</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>chronic LBP</td>
<td></td>
</tr>
<tr>
<td>Capability</td>
<td>Skills</td>
<td>I have the skills to use PROMs in the management of chronic LBP</td>
<td>71</td>
</tr>
<tr>
<td>Motivation</td>
<td>Beliefs</td>
<td>I am confident that I can use PROMs in the management of chronic LBP</td>
<td>71</td>
</tr>
<tr>
<td>Motivation</td>
<td>Intentions</td>
<td>I have a strong intention to use PROMs in the management of chronic LBP</td>
<td>66</td>
</tr>
<tr>
<td>Capability</td>
<td>Knowledge</td>
<td>I know how to apply PROMs in the management of chronic LBP</td>
<td>64</td>
</tr>
<tr>
<td>Motivation</td>
<td>Optimism</td>
<td>With regards to using PROMs in the management of chronic LBP, I feel</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>optimistic about the benefits for patients</td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>Emotions</td>
<td>I generally feel comfortable using PROMs in the management of chronic LBP</td>
<td>64</td>
</tr>
<tr>
<td>Motivation</td>
<td>Beliefs</td>
<td>Using PROMs in the management of chronic LBP is useful and has many</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>advantages for patients</td>
<td></td>
</tr>
<tr>
<td>Opportunity</td>
<td>Resources</td>
<td>The resources that I need to use PROMs in the management of chronic LBP</td>
<td>60</td>
</tr>
</tbody>
</table>

Abbreviation: % = the total percentage of respondents who ‘strongly agreed’ or ‘agreed’
Figure 4. Determinants to respondents’ use of PROMs with patients (n = 58)
Chart illustrates the percentage of ‘strongly agree’, ‘agree’, ‘neutral’, ‘disagree’, and ‘strongly disagree’ responses for each item. Abbreviations: PROMs = Patient Reported Outcome Measures; mx = management; px = patient; CLBP = chronic low back pain; HCPs = healthcare practitioners
**Benefits of Using PROMs with Patients who have Chronic Low Back Pain**

Findings for the open-ended question ‘What benefits have you observed from using Patient-Reported Outcome Measures for chronic low back pain?’ were coded and then organised into four categories and twelve sub-categories (Table 4). These categories are expanded upon below with quotes that are, for the most part, presented in their entirety. Where partial quotes are presented, efforts are made to retain the meaning of the quote in full.

<table>
<thead>
<tr>
<th>Table 4. Benefits of using PROMs with patients (n = 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categories</td>
</tr>
<tr>
<td>For patients</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>For clinicians</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>For third-party payers</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: ACC = Accident Compensation Corporation; PROM = Patient Reported Outcome Measure

**Benefits for Patients**

Respondents most commonly described ways that PROMs were beneficial for patients. Twelve respondents inferred monitoring when they reported on the benefits of using PROMs to remind patients of how much progress they had made. Respondent 45 also perceived that this process could “empower […] patients when they see changes and have come further than they think they have”.

Beyond monitoring, few respondents described how they tended to use PROMs with patients. Five respondents noted that PROMs could be used to enhance patient education and understanding, however provided little elaboration of how or why this was the case. Respondent 51 thought that PROMs could help patients identify aggravating and relieving factors and to further understand their pain. Respondent 23 indicated that PROMs can be used alongside other educational tools when informing patients about their pain.
Respondents alluded to their skill in using PROMs to actively engage patients in their care. Four respondents found that the benefit of using PROMs was patient understanding and treatment compliance. Respondent 45 summarised that their use of PROMs to empower patients had resulted in “an even better adherence to the management plan”. They also observed that this could result in a better treatment outcome.

**Benefits for Clinicians**
The benefits for clinicians regarding their use of PROMs were variously reported, although patient assessment, goal setting, and monitoring were clearly articulated. For Respondent 25, PROMs provided “clear markers of limitations and goals of where they would like to be”. Similarly, in the assessment, Respondent 73 indicated that PROMs facilitated “an understanding of pain vs interference for patients”, and Respondent 23 reported the benefits of identifying a poor prognosis or barriers to recovery that could be “physical or mental/emotional”. Fourteen respondents indicated that they found PROMs beneficial for monitoring. However, as a cohort, it is unclear whether benefits were for the clinician, the patient, or otherwise. Here, two respondents acknowledged that PROMs allowed them to track treatment progress but did not expand upon how this aided their clinical reasoning.

**Benefits for Third-Party Payers**
Benefits for third-party payers were rarely reported and those that were tended to be for ACC. Respondents indicated that they used PROMs “to access ACC funding” (e.g., Respondent 33) or to demonstrate patient progress to ACC.

**Other**
Although respondents tended not to specify the outcomes that they used to monitor patients with chronic LBP, two respondents indicated that they preferred to use individualised PROMs that were specific and meaningful for patients. These respondents referred to the PSFS and Activities of Daily Living, although did not name specific measures for the latter. Respondent 84 suggested that activities like “I can [tie] my shoes, drive my car, play tennis without pain, are useful measures that patients appreciate”.

Respondent 53 indicated that there were “Not any significant benefits” to be had, however, ‘often’ used the PSFS, NPRS, and VAS with patients who have chronic LBP. This respondent provided no information on this perceived lack of benefit nor on why they continued to use PROMs.
Barriers to Using PROMs with Patients who have Chronic Low Back Pain

Findings from the two final questions of the survey—‘what disadvantages have you experienced from using PROMs for chronic LBP’ and ‘what prevents you from using PROMs for chronic LBP’—are presented alongside each other as they both addressed barriers to using PROMs. These findings were analysed and then categorised in accordance with the COM-B system \[45,46\] and the TDF \[46,47\] (Table 5).

Table 5. Barriers to using PROMs with patients (n = 47)

<table>
<thead>
<tr>
<th>COM-B Categories</th>
<th>TDF Sub-categories</th>
<th>TDF Sub-sub-categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability</td>
<td>Knowledge</td>
<td>Theoretical (n = 4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Procedural (n = 4)</td>
</tr>
<tr>
<td></td>
<td>Memory</td>
<td>n/a (n = 3)</td>
</tr>
<tr>
<td></td>
<td>Behavioural regulation</td>
<td>n/a (n = 1)</td>
</tr>
<tr>
<td>Opportunity</td>
<td>Resources</td>
<td>Time (n = 26)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Questionnaires (n = 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Training (n = 4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Administration (n = 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other (n = 1)</td>
</tr>
<tr>
<td>Motivation</td>
<td>Beliefs about consequences</td>
<td>Patients (n = 8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patients (n = 16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clinical reasoning (n = 10)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relationship building (n = 4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Priorities (n = 5)</td>
</tr>
</tbody>
</table>

Abbreviations: ACC = Accident Compensation Corporation; PROM = Patient Reported Outcome Measure

**Capability**

Respondents indicated that a lack of knowledge prevented them from using PROMs with patients who had chronic LBP. Some respondents indicated a lack of theoretical knowledge with comments such as “I haven’t learned them, I’m not familiar with them. I’m not sure how they would improve my practice. And people like to tell me the story of how they are” (Respondent 21). Two respondents indicated a lack of procedural knowledge by “not knowing exactly how to apply some of them” (Respondent 23) and not knowing “the most useful one to use” (Respondent 18). However, the later respondent was unfamiliar with how to select PROMs.

‘Memory’ prevented three respondents from using PROMs with patients who have chronic LBP. Whereas one respondent tended to “forget to use” PROMs (Respondent 14), the other respondents forgot “to follow up” (Respondent 33) and “implement PROMs at discharge..."
Tangentially related, Respondent 26 reported challenges with ‘behavioural regulation’ as they found it difficult to make PROMs “a habit and a natural part of the process”.

**Opportunity**

‘Time’ was the most common barrier to respondents’ use of PROMs, being noted in a variety of ways. Some respondents problematised external time constraints. Other respondents noted factors that were intrinsic to the intervention, such as “education time” (Respondent 71), “explanation to patient, [and] following up” (Respondent 85). Respondent 84 also indicated issues of value by stating that the “Questionnaires feel impersonal and waste time”. A final respondent highlighted the time-cost of becoming “familiar enough with them to use easily in a clinical setting” (Respondent 39).

Respondents reported problems with PROM questionnaires that help to explain their time-cost. Four respondents identified that PROMs were sometimes too long, clunky, and therefore burdensome for patients to fill out. Respondent 7 avoided PROMs that were “overly detailed”. Respondents also problematised the administrative burden of PROMs without elaborating on whether this was a generic of questionnaire-specific problem.

‘Lack of training’ prevented four respondents from using PROMs with patients who have chronic LBP. Respondents differed in the extent that they attributed this to their initial training as an osteopath versus training in general. One respondent determined that PROMs were not introduced at the time of their training yet had been in practice for 11-15 years.

Respondents highlighted the significance of patients’ social influence in their use of PROMs. Respondent 45 commented that patients “don’t want to do paperwork, they want to get touched”. Respondent 41 indicated that PROMs require patient participation, yet patients often adopt a passive role when visiting an osteopath. Four other respondents reinforced this perspective by reporting on deficits in “patient buy-in” (Respondent 26), “patient perspective” (Respondent 31), and “patients’ compliance at discharge” (Respondent 76). Respondent 67 commented that they used the VAS because “patients get used to giving an answer”.

**Motivation**

Alongside social influence, respondents described patient-related disadvantages of PROMs that may affect their motivation. Some respondents indicated that patients struggle and get agitated when asked to complete PROMs. Eleven respondents described ways that PROMs may actively harm patients. For example, respondent 55 advised that pain assessment can
result in “an over-focus on pain and not function”. Respondents raised concerns that this may “make yellow flags worse” (respondent 45) and result in “possible catastrophising” (respondent 64).

Respondents described tensions between the use of PROMs and the delivery of personalised care that may interrupt the development of the patient-clinician relationship. For example, respondent 26 commented on the “the feeling of not being personalised and engaged but instead just following a script and ticking boxes”. Respondent 19 also indicated an aversion to standardised tools with the statement “it can be quite a restrictive and 2-dimensional tool that lacks the ability to evolve with the patient”. This latter respondent specified that the issue did not apply to the PSFS.

Respondents questioned the validity and subsequent utility of PROM findings in chronic pain assessment for a variety of reasons. One respondent demonstrated confusion on the role of subjectivity in chronic pain assessment and PROMs by commenting “the self-reporting is subjective” (respondent 75). Two respondents raised concerns that the variable nature of PROM (specifically NPRS) findings compromise their utility. Respondent 81 also questioned patients’ judgement in their self-assessments of pain and function with the following words:

“Some patients’ pain scales are not always accurate. Even when they aren’t in intense pain (but think they are) or say they can’t do something then they do it easily without thinking about it in front of you in the consultation”.

Respondent 49 further challenged the validity of patient report on the basis that some individuals willfully misrepresent outcomes. In the respondent’s words, “some patients linger and don’t want to fully recover so aren’t always honest with their answers.”

Respondents indicated that PROMs were not a priority in their practice. Some respondents expressed this directly, and others inferred they would not implement PROMs as they were happy with their current practice. Respondent 52 also indicated a dilemma in prioritisation being a “loss of technical work versus writing reports”.

Respondent 40 reported that they experienced no disadvantages when using PROMs with chronic LBP. This respondent used the PSFS and NPRS and did not explain their reasons for not using other PROMs.
Discussion

The use of individual PROMs data may have a role in furthering patient-centred care, particularly in the management of long-term conditions such as chronic LBP. This study is the first to investigate New Zealand osteopaths’ use of the measures both in general and with patients who have chronic LBP. The findings indicated that the respondents used pain scales far more frequently than other types of PROMs. In accord with this, the respondents tended to use PROMs to assess pain intensity and sometimes also functional disability. They tended not to use PROMs to assess patients’ sensory and affective qualities of pain, health-related quality of life, and psychosocial factors associated with chronic LBP. As for determinants to use, respondents appeared to have a fairly high regard for their capability to use PROMs yet tended to be constrained by limited resources and social norms. Respondents paid more attention to the consequences that PROMs had for patients more than any other stakeholder.

Pain scales were by far the most used PROMs in this study, with almost 80% of respondents indicating that they either used the NPRS or VAS with patients who have chronic LBP. In contrast, only 34.18% (n = 27) of respondents ‘often’ to ‘always’ used other types of PROMs. Most of this can be attributed to respondents’ use of the PSFS (20.37%; n = 25) and ODI (6.33%; n = 5) to assess for functional disability. These findings correspond with the international literature on manual therapists’ use of PROMs, both in general and for LBP [19,21–25,32,54,55]. Respondents may therefore consider the improvement of pain intensity and functional disability as key professional responsibilities. This could be associated with osteopathy’s focus on the neuromuscular system and identification with manual therapy [56,57]. This could also be associated with ACC’s [58] drive to return patients to work. After all, OCNZ [59] has advised osteopaths to use the NPRS and PSFS for ACC. It is as yet unclear whether these findings were affected by the study’s focus on chronic LBP. Manual therapists have indicated high rates of use for pain scales both in general [32] and for LBP [19,22–25,54,55]. Respondents also gave no indication that they factored the disability-burden of chronic LBP into their selection of PROMs.

Respondents’ assessment of pain appears to be unidimensional as they did not use PROMs to assess the sensory and affective qualities of pain. Only one respondent reported using the McGill Pain Questionnaire as an ‘other’ PROM. Respondents’ assessment of chronic LBP also appears fairly biomedical as they did not use PROMs to assess health-related quality of life or psychosocial factors associated with chronic LBP. These appearances might be contradicted if respondents explored these outcomes in the clinical history. They are nevertheless of
interest as ‘best practice’ is widely accepted as the biopsychosocial management of chronic LBP. ‘Best practice’ also incorporates a knowledge of contemporary pain science and the possibility that pain-related emotions can interfere with a patient’s day-to-day functioning, self-regulation, and ability to cope with their pain. Further research needs to examine whether osteopaths should be assessing these outcomes and, if so, whether they should be using PROMs to do so. Once again, a key point for revision could be osteopathy’s identification with manual therapy. This identification may help to explain why such gaps have been found to be common among manual therapists’ use of PROMs internationally. This identification may perpetuate biomedicalism across the so-called manual therapies. In this study, respondents often commented on needing to prioritise between questionnaires and the delivery of manual therapy. Respondents also related that patients often have a preference and expectation for manual therapy.

Triangulation of results from the closed and open-ended questions reveals that PROMs were most often used and conceived as monitoring tools. Fewer respondents conceived of PROMs as screening tools, and this may be attributed to this study’s focus on chronic LBP. Screening tools (e.g., the STarT Back Screening tool) are commonly recommended for the prognostication of acute rather than chronic LBP, so the high use among other manual therapists may be specific to acute LBP. Monitoring does not appear to be similarly affected by this study’s focus on chronic LBP, having been common irrespective of whether a study’s focus is on clinical practice, LBP, or chronic LBP. Respondents’ emphasis on monitoring may also reference a general set of assumptions about PROMs’ function in osteopathic practice. Most profession-specific advocacy has focussed on osteopaths’ use of individual PROMs data for monitoring patient outcomes. This may be historically mediated by one of PROM’s previous titles as ‘outcomes questionnaires’.

Generally, respondents appeared to have a fairly high regard for their capability to use PROMs with patients who have chronic LBP. Although seven respondents determined that poor knowledge prevented their use of the measures, most respondents gave positive self-assessments in the closed-ended questions on capability. ‘Knowledge’ has been identified as both a common and significant barrier to manual therapists’ use of PROMs internationally; however, methodological variation has contributed to this difference in findings. For example, a survey of Australian osteopaths determined that 44% of respondents had sufficient knowledge and confidence to use PROMs in clinical practice. This low percentage could be because pain scales were not included in the researchers’ definition of PROMs. If pain scales were also excluded from this study’s definition, then it seems likely that respondents would have made lower self-assessments of their capability to use PROMs. Beyond this, it is
important to note that respondents’ self-evaluations were based on judgements of what constitutes adequate knowledge in the context of osteopathic practice. Their high regard for their capabilities could therefore be tied to a low regard for (most) PROMs. There is a need for further evaluation in the profession of what constitutes sufficient capability with PROMs.

Respondents’ opportunity to use PROMs appeared to be constrained by issues of time and social influence. ‘Time’ was most commonly noted in the open-ended responses and is somewhat expected having been identified as both a prime resource and barrier to manual therapists’ use of PROMs [19,23,25,32–34]. This study adds to these findings by noting issues of value; that is, PROMs were not always perceived as worth their time. The social influence of respected healthcare practitioners and patients were also identified as key barriers to use. Some comments on social influence appeared to reference social norms. For example, where respondent 45 related that they did not use PROMs because patients expect manual therapy, osteopathy’s identification with manual therapy could be a limiting norm [56]. Aside from a stray observation that Swedish physiotherapists avoided PROMs when patients felt pressed for time [33], studies on other manual therapists appear not to have reported on social influence or norms [19,21–23,32]. This could be due to their lack of a comprehensive theoretical framework, as used in this study. The social barriers identified in this study are somewhat expected as profession-specific advocacy for PROMs has been low in impact and frequency [3,6,7].

Respondents reflected on the consequences of using PROMs for patients more than any other stakeholder, both generally and for specific applications. Reflecting on their reasons for monitoring, for example, respondents observed that PROMs increase patients’ awareness of their progress with the potential to empower patients over time. Although two respondents specified that they (the clinician) reviewed the PROM findings to track patient progress, respondents gave no indication that this affected their clinical decision-making. Respondents also gave no indication that they engaged in longitudinal reflection on PROM outcomes to improve their quality of care. These processes have been previously theorised to be instrumental for improving patients’ health outcomes and experiences [9]. Respondents’ lack of regard for these benefits could suggest a potential deficit in experience or knowledge surrounding the possibilities of individual PROMs feedback in clinical practice. Alternately, the apparent lack of regard could be due to a focus on proximal benefits or equally the brevity of responses in survey research. Further research needs to explore osteopaths’ perspectives on how and why PROMs could be useful for clinical decision-making in their management of patients with chronic LBP.
As for third party payers, few respondents reported using PROMs for ACC. This contrasts with findings from a survey Australian osteopaths where respondents frequently used PROMs for third-party payers (58%) and were motivated by the requirements of third-party insurance schemes (82%) [32]. Presumably, this relates to the requirements of third-party payers. Both of these studies highlight the significant motivational impact that third-party payers can have on the use of PROMs, irrespective of respondents’ beliefs about the therapeutic consequences of using the measures. The difference between studies might be explained by this study’s focus on chronic LBP. Given that ACC typically provides no-fault insurance for acute injury rather than chronic disease [67], it stands to reason that is not immediately relevant to the study’s focus on chronic LBP. There are also no current requirements for osteopaths to use PROMs for ACC. Those few respondents who claimed otherwise could have relied on OCNZ’s [59] recommendation.

Limitations
As is common among cross-sectional surveys with a low response rate, this study’s findings were challenged by selection and reporting biases. Respondents could have been systematically different from non-responders by having an existing interest in PROMs, and this could have resulted in higher estimations of use than exists in the profession nationally [68]. Although the survey was anonymous, respondents could have skewed their responses to present an image of themselves that was perceived as favourable [69,70]. Respondents could have also recalled past events (e.g., their frequency of use) inaccurately [70]. It is unclear whether the demographic distribution of the study sample was comparable to the national osteopathic profession.

A key methodological challenge in this study was the heterogeneity and complexity of PROMs and their interventions. This heterogeneity compromised the findings on the frequency of PROM applications and determinants to use. Recommendations for future survey-based studies are to include definitions for each application in the survey questionnaire, or to include rationales for using PROMs instead (e.g., ‘to inform clinical decision making’). As for determinants to use, this study’s quantitative results were fairly general because of its focus on several ‘problem-behaviours’ rather than a single ‘target-behaviour’ [71]. Future studies would benefit from either specifying a target behaviour or exploring one potential determinant, such as osteopaths’ attitudes towards PROMs.
Further Research

Opportunities for research were noted throughout the course of this discussion. At the fore, the heterogeneity of PROMs and their interventions provide scope for further investigation of how and why osteopaths use PROMs. Such research could be based on describing current practice or it could be aspirational. Action research (or similar methodologies) could be used to develop a vision for how PROMs might be beneficial in osteopathic practice and serve as a basis for educational initiatives or standards. Inspiration may also be taken from realist evaluations that aim to explain how context informs the mechanisms through which a PROM intervention works [9,48,72–74]. In the event that researchers aim to implement PROMs in osteopathic practice, it is recommended they do so after identifying a specific target behaviour [46,71,75]. Researchers may then adopt a theory or theoretical framework for the comprehensive investigation of determinants and subsequent implementation design.

Conclusion

This study indicated that New Zealand osteopaths probably use PROMs to assess the burden of chronic LBP, with a preference for unidimensional over multidimensional pain assessment. New Zealand osteopaths probably do not use PROMs to assess psychosocial factors and this may be attributed to their perceived scopes of practice. Although respondents in this study generally agreed that they were capable using PROMs with patients, respondents appeared to have limited understanding of the measures’ diverse applications and benefits. New Zealand osteopaths may be most receptive to changing their behaviour if they are presented with relevant PROMs-led interventions and evidence of their benefits for patients.

Conflict of Interest Statement

No conflict of interest has been declared by the authors.
References


11. Eilayyan O, Visca R, Zidarov D, Ware P, Bussières A, Ahmed S. Developing theory-informed knowledge translation strategies to facilitate the use of patient-reported outcome measures in interdisciplinary low back pain clinical practices in Quebec:
Mixed methods study. BMC Health Serv Res. 2020;20(1).


47. Cane J, O’connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research [Internet]. 2012 [cited 2023 Apr 24]. Available from: http://www.implementationscience.com/content/7/1/37


68. the bmj. Chapter 4. Measurement error and bias [Internet]. Epidemiol [cited 2023 Apr 20]. Available from: https://www.bmj.com/about-bmj/resources-readers/publications/epidemiology-uninitiated/4-measurement-error-and-bias


Section Four: Appendices
Appendix A: International Journal of Osteopathic Medicine

GUIDE FOR AUTHORS

Your Paper Your Way
We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

To find out more, please visit the Preparation section below.

INTRODUCTION
The Editors of the Journal welcome contributions for publication from the following categories: Letters to the Editor and Editorials, Reviews and Original Research articles, Protocols, Commentaries, Education, Clinical and Practice articles (Case Studies)

The Guidelines are separated into the following sections:

A Online Submission
B Types of Contributions
C General Guidance
D Preparation of the Manuscript
E Specific Guidance for Original Research Articles
F Specific Guidance for Protocols
G Post Acceptance

Types of contributions
For all the following types of contributions authors are requested to consider the international readership of the journal and to be aware of the need to explain local contexts or define terminology where these are likely not to be commonly understood internationally. Word limits exclude tables, figures and reference list.

Letters to the Editor (up to 1,000 words)
As is common in biomedical journals the Editorial Board welcomes critical responses to any aspect of the journal. In particular, letters that point out deficiencies and that add to, or further clarify points made in a recently published work, are welcomed. The Editorial Board reserves the right to offer authors of papers the right of rebuttal, which may be published alongside the letter.

Reviews and Original Articles (2,000 - 5,000 words)
Authors should select "Review Article" or "Full Length Article" at the submission stage when submitting either a Review or an Original Research article.
These should be either (i) reports of new findings related to osteopathic medicine that are supported by research evidence. These should be original, previously unpublished works; or (ii) a critical or systematic review that seeks to summarise or draw conclusions from the established literature on a topic relevant to osteopathic medicine.

Please see specific guidance below for original research articles and the requirement to submit a checklist from the appropriate reporting guideline together with your paper as a guide to the editors and reviewers of your paper. The checklists for each reporting guideline can be found on the EQUATOR website. Checklists should be uploaded at submission as "Checklist" file types.

Short review (1,500-3,000 words)
The drawing together of present knowledge in a subject area, in order to provide a background for the reader not currently versed in the literature of a particular topic. Shorter in length than and not intended to be as comprehensive as that of the critical or systematic review paper. These papers typically place more emphasis on outlining areas of deficit in the current literature that warrant further investigation.

Research Note (up to 1,500 words)
Authors should select "Research Paper" at submission stage when submitting a Research Note.
Findings of interest arising from a larger study but not the primary aim of the research endeavour, for example short experiments aimed at establishing the reliability of new equipment used in the primary experiment or other incidental findings of interest, arising from, but not the topic of the primary research. Includes further clarification of an experimental protocol after addition of further controls, or statistical reassessment of raw data.

**Preliminary Findings (1,500-2,500 words)**
Authors should select "Preliminary Report" at submission stage when submitting a Preliminary Findings paper.
Presentation of results from pilot studies which may establish a solid basis for further investigations. Format similar to original research report but with more emphasis in discussion of future studies and hypotheses arising from pilot study.

**Professional Commentaries (up to 2,000 words)**
Includes articles that do not fit into the above criteria as original research. Includes commentaries and essays especially in regards to history, professional identity, clinical scope and development, and political and legal aspects of osteopathic medicine.

**Clinical Practice**
Authors should select the article type "Clinical Commentary" when submitting a Clinical Practice paper - there will be an option within the submission process to further select the type of format as below. Authors are encouraged to submit papers in one of the following formats: Case Report, Case Problem, and Evidence in Practice.

i. **Case Reports** - usually document the management of one patient, with an emphasis on presentations that are unusual, rare or where there was an unexpected response to treatment (e.g. an unexpected side effect or adverse reaction). Authors may also wish to present a case series where multiple occurrences of a similar phenomenon are documented. Preference will be given to reports that are prospective in their planning and utilise Single System Designs, including objective measures.

ii. The aim of the **Case Problem** is to provide a more thorough discussion of the differential diagnosis of a clinical problem. The emphasis is on the clinical reasoning and logic employed in the diagnostic process.

iii. The purpose of the **Evidence in Practice** report is to provide an account of the application of the recognised Evidence Based Medicine process to a real clinical problem. The paper should be written with reference to each of the following five steps: 1. Developing an answerable clinical question. 2. The processes employed in searching the literature for evidence. 3. The appraisal of evidence for usefulness and applicability. 4. Integrating the critical appraisal with existing clinical expertise and with the patient's unique biology, values, and circumstances. 5. Reflect on the process (steps 1–4), evaluating effectiveness, and identifying deficiencies.

Please note for Case Reports there is a requirement to submit a checklist from the CARE reporting guideline together with your paper as a guide to the editors and reviewers of your paper. The checklists for each reporting guideline can be found on the EQUATOR website.

**Protocols (1,500 - 2,000 words)**
Authors should select "Method Article" at submission stage when submitting a Protocol.
The IOM accepts the submission of protocols of randomised interventions, systematic reviews and meta-analyses, observational studies, and selected phase I and II studies (novel indication; a strong or unexpected beneficial or adverse response; or a novel mechanism of action), with the overall aim to encourage good principles in clinical research design.

The editors are looking for studies that will appeal to a wide general readership. The question being addressed and the planned design and analysis will need to be as original as possible, topical, and valid. All protocols will be subject to the journal's usual peer review process.

**Masterclasses**
Authors should select "Feature Article" at submission stage when submitting a Masterclass.
The purpose of the Masterclass section is to describe in detail clinical aspects of osteopathic medicine or topics relevant to osteopathic clinicians. This may focus on specific treatment techniques, a particular management approach, management of a specific clinical entity, or topics such as understanding research design, use of measurement in practice, and professional issues such as clinical governance and audit. The majority of Masterclasses are commissioned by the Editors, but if you wish submit an idea for a Masterclass for consideration of publication please contact Oliver Thomson (O.Thomson@bso.ac.uk) or David Evans (dwe@backpainclinic.co.uk).

- The article should be between 3500-4000 words in length excluding references.
- A short summary should precede the main body of the article overviewing the contents.
- The introduction should review the relevant literature and put the subject matter into context.
- The main body of the text will describe the technique or approach in detail.
- Illustrations are considered an essential part of the Masterclass in order to fully inform the reader and a minimum of six photographs or line drawings are required.
- In addition, authors may wish to include supplementary material which would be available online only. This may include, for example, podcasts, videoclips, animation sequences, high-resolution colour images, author reflections on the Masterclass, and background datasets. Authors are invited to refer to previously published Masterclasses as examples.

**New section - Osteopathic Education:**

This new section of the *International Journal of Osteopathic Medicine* provides accounts of new teaching and learning methods, curriculum development and implementation, and assessment strategies in undergraduate and post-qualifying osteopathic education, and continuous professional development initiatives. It also serves as a forum for communication between osteopathic educators, policy developers and those involved in clinical practice. Papers which focus on osteopathic education in both classroom and clinical/practice environments are welcomed for this new section of the journal.

It is essential that the evidence-base to osteopathic education is developed and this is reflected in papers submitted for publication. In alignment with the journal’s overall Aims and Scope, papers submitted for consideration of publication should be relevant to an international audience, even if they are national in scale of study. The editorial team wish to encourage submission of papers that demonstrate:

- Innovation and development of education
- Creativity in teaching and learning and assessment strategies
- Evaluation and quality assurance of academic standards
- Advancement of practice-based education
- Collaborative interdisciplinary education initiatives
- Delivery and evaluation of education within osteopathic and related services.

If your submission constitutes original research or is in the form of a review, please see Specific guidance below for original research articles and the requirement to submit a checklist from the appropriate reporting guideline together with your paper as a guide to the editors and reviewers of your paper. The checklists for each reporting guideline can be found on the EQUATOR website.

When submitting a paper for the Education Section authors will be asked to select the option “Education” during the submission process. Authors are first asked to identify the type of paper they are submitting (ie. Review Article, Full Length Article) before being asked to confirm whether it is to be considered for the Education Section.

**Author Enquiries**

For enquiries relating to the submission of articles (including electronic submission where available) please visit this journal’s homepage at https://www.elsevier.com/jiom. You can track accepted articles at https://www.elsevier.com/trakarticle and set up e-mail alerts to inform you of when an articles status has changed. Also accessible from here is information on copyright, frequently asked questions and more.

Contact details for questions arising after acceptance of an article, especially those relating to proofs, will be provided by the publisher.

**Submission checklist**

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

---

**AUTHOR INFORMATION PACK 21 Jan 2022**

www.elsevier.com/locate/jiom
Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:
• E-mail address
• Full postal address

All necessary files have been uploaded:
Manuscript:
• Include keywords
• All figures (include relevant captions)
• All tables (including titles, description, footnotes)
• Ensure all figure and table citations in the text match the files provided
• Indicate clearly if color should be used for any figures in print
Graphical Abstracts / Highlights files (where applicable)
Supplemental files (where applicable)
Cover Letter
Conflict of Interest Statement
Author agreement

Further considerations
• Manuscript has been 'spell checked' and 'grammar checked'
• All references mentioned in the Reference List are cited in the text, and vice versa
• Permission has been obtained for use of copyrighted material from other sources (including the Internet)
• Relevant declarations of interest have been made
• Journal policies detailed in this guide have been reviewed
• Referee suggestions and contact details provided, based on journal requirements

For further information, visit our Support Center.

BEFORE YOU BEGIN
Ethics in publishing
Please see our information on Ethics in publishing.

A statement of Ethical Approval is required to be completed during online submission and included in the Conflict of Interest file and uploaded as a separate file in the final stage of the online submission system. Examples of such statements are given below: "The study design and procedures were approved by XXXX (Approval number: XXXX)". "The study was granted an exemption by the institutional review board".

Studies in humans and animals
If the work involves the use of human subjects, the author should ensure that the work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. The manuscript should be in line with the Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals and aim for the inclusion of representative human populations (sex, age and ethnicity) as per those recommendations. The terms sex and gender should be used correctly.

Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

All animal experiments should comply with the ARRIVE guidelines and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, 1986 and associated guidelines, EU Directive 2010/63/EU for animal experiments, or the National Research Council's Guide for the Care and Use of Laboratory Animals and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.

Patient anonymity
Studies on patients or volunteers require ethics committee approval and informed consent which should be documented in the manuscript.
Patients have a right to privacy. Therefore identifying information, including patients' images, names, initials, or hospital numbers, should not be included in videos, recordings, written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and you have obtained written informed consent for publication in print and electronic form from the patient (or parent, guardian or next of kin where applicable). If such consent is made subject to any conditions, Elsevier must be made aware of all such conditions. Evidence of written consent must be provided to Elsevier on request.

Even where consent has been given, identifying details should be omitted if they are not essential. If identifying characteristics are altered to protect anonymity, such as in genetic pedigrees, authors should provide assurance that alterations do not distort scientific meaning and editors should so note.

Authors submitting manuscripts as Case Reports, Case Problems, and Evidence in Practice should ensure that they have received consent from patients who are the subject of such reports. A statement to this effect should be included in the manuscript.

If such consent has not been obtained, personal details of patients included in any part of the paper and in any supplementary materials (including all illustrations and videos) must be removed before submission.

Declaration of interest
All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double anonymized) or the manuscript file (if single anonymized). If there are no interests to declare then please state this: 'Declarations of interest: none'. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches. More information.

A Conflict of Interest statement should be uploaded as a separate file in the final stages of the online submission system.

Conflict of Interest file: A Conflict of Interest file is required and should include statements of 1) Conflict of Interest, (2) Funding Sources, and (3) ethical approval details (if applicable) under these headings. If some, or all three, do not apply, please still include the headings stating “None” / “Not applicable”. Clinical Trial Registry name and registration number and Acknowledgments may be added if applicable as 4th and 5th headings. For revised manuscripts this information must be transferred to the manuscript file.

Submission declaration and verification
Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see ‘Multiple, redundant or concurrent publication’ for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service Crossref Similarity Check.

Preprints
Please note that preprints can be shared anywhere at any time, in line with Elsevier's sharing policy. Sharing your preprints e.g. on a preprint server will not count as prior publication (see 'Multiple, redundant or concurrent publication' for more information).

Use of inclusive language
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek
gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. When coding terminology is used, we recommend to avoid offensive or exclusionary terms such as "master", "slave", "blacklist" and "whitelist". We suggest using alternatives that are more appropriate and (self-) explanatory such as "primary", "secondary", "blacklist" and "allowlist". These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

All manuscripts submitted to the journal should be accompanied by an Author Agreement file - this is a statement of author contribution. The purpose of the Statement is to give appropriate credit to each author for their role in the study. All persons listed as authors should have made substantive intellectual contributions to the research. To qualify for authorship each person listed should have made contributions in each of the following:
1) Contributions to conception and design; data acquisition; data analysis and interpretation;
2) Drafting of manuscript, or critical revision for important intellectual content;
3) All authors must have given approval to the final version of the manuscript submitted for consideration to publish.

Acquisition of funding; provision of resources; data collection; or general supervision, alone, is not sufficient justification for authorship. Contributors who do not meet the criteria for authorship as outlined above should be listed in the Acknowledgements section. Acknowledgements may include contributions of technical assistance, proof reading and editing, or assistance with resources and funding. The statement may be published in the paper as appropriate.

Example of suggested format (note the use of author initials).
AB conceived the idea for the study. AB and CD contributed to the design and planning of the research. All authors were involved in data collection. AB and EF analysed the data. AB and CD wrote the first draft of the manuscript. EF coordinated funding for the project. All authors edited and approved the final version of the manuscript.

Authors are expected to consider carefully the list and order of authors before submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only before the manuscript has been accepted and only if approved by the Journal Editor. To request such a change, the Editor must receive the following from the corresponding author: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors after the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

In line with the position of the International Committee of Medical Journal Editors, the journal will not consider results posted in the same clinical trials registry in which primary registration resides to be prior publication if the results posted are presented in the form of a brief structured (less than 500 words) abstract or table. However, divulging results in other circumstances (e.g., investors' meetings) is discouraged and may jeopardise consideration of the manuscript. Authors should fully disclose all posting in registries of results of the same or closely related work.

Authors should include the Clinical Trial Registration number in the Conflict of Interest statement (see above) at original submission stage, and will be required to transfer the number into the manuscript file for revised articles.

The text of original research for a quantitative or qualitative study is typically subdivided into the following sections:

Introduction
Describe the wider context of the topic and its relevance providing selected citations that evidence and underpin the context. Identify key relevant research and briefly describe the strengths and weaknesses of past work and identify the gaps in the literature and key questions that are pertinent to the topic and practice. Build on this descriptive account to establish an argument for the manuscript’s focus and end the introductory section with the aims of the research that is being reported and or the research questions.

Materials and Methods
Describe your selection of observational or experimental participants (including controls). Identify the methods, apparatus (manufacturer’s name and address in parenthesis) and procedures in sufficient detail to allow workers to reproduce the results. Give references and brief descriptions for methods that have been published but are not well known; describe new methods and evaluate limitations.

Indicate whether procedures followed were in accordance with the ethical standards of the institution or regional committee responsible for ethical standards. Do not use patient names or initials. Take care to mask the identity of any participants in illustrative material.

Results
Present results in a logical sequence in the text, tables and illustrations. Do not repeat in the text all the data in the tables or illustrations. Emphasise or summarise only important observations.

Discussion
Emphasise the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the introduction or the results section. Include implications of the findings and their limitations, and include implications for future research. Relate the observations to other relevant studies. Link the conclusion with the goals of the study, but avoid unqualified statements and conclusions not completely supported by your data. State new hypothesis when warranted, but clearly label them as such. Recommendations, when appropriate, may be included.

Conclusion
A summary of the pertinent findings and, relevance of the study and implications of the study for future research.

Appendices
Appendices may also be used to publish supplementary files online, to which a reference should be made in the printed article. Material that is to be included in appendices should be submitted in separate “e-component” files.

Types of research designs
Manuscripts are required to adhere to recognized reporting guidelines relevant to the research design used. These identify matters that should be addressed in your paper. These are not quality assessment frameworks and your study need not meet all the criteria implied in the reporting guideline to be worthy of publication in the journal.

To improve the quality of reporting of other categories of research, the IJOM supports the initiatives available through the EQUATOR Network (Enhancing the Quality and Transparency Of health Research) which houses a database of all reporting guidelines for health research (http://www.equator-network.org). All authors of research articles and reviews are required to complete and submit a checklist from the appropriate reporting guideline together with your paper as a guide to the editors and reviewers of your paper. The checklists for each reporting guideline can be found on the EQUATOR website. A copy of the complete checklist should accompany your submission. The checklist should be uploaded at submission as a “Checklist” file type.

Reporting guidelines endorsed by the journal are listed below:

Observational cohort, case control and cross sectional studies - STROBE - Strengthening the Reporting of Observational Studies in Epidemiology

Quasi-experimental/non-randomised evaluations - TRENDS - Transparent Reporting of Evaluations with Non-randomized Designs
Randomised (and quasi-randomised) controlled trial - CONSORT - Consolidated Standards of Reporting Trials

Study of Diagnostic accuracy/assessment scale - STARD - Standards for the Reporting of Diagnostic Accuracy Studies

Quality Appraisal of Reliability Studies - QAREL

Consensus-based Clinical Case Reporting Guideline Development - CARE

Systematic Review of Controlled Trials - PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Systematic Review of Observational Studies - MOOSE - Meta-analysis of Observational Studies in Epidemiology

Qualitative researchers might wish to consult the guideline listed below:


Protocols

Organisation of a Protocol - the following need to be adequately addressed.

• Title
• Abstract/Summary - this should provide a concise description of the purpose of the Protocol and should not exceed 200 words.
• Background, including rationale and any previous systematic review(s).
• Keywords - provide 4-10 keywords.
• Principal investigator(s); contact details.
• Aim(s).
• Design (randomised, double-blind) - including inclusion and exclusion criteria; intervention(s)/method; primary and secondary endpoint(s); side-effects reporting and quantification
• Statistical analysis - including sample size and power calculations; type of analysis; statistical testing.
• Ethical issues - including ethics committee approval; informed consent form and information sheet.
• Publication plan.
• Time required - an estimation of the time required to run the protocol should be given per separate step and for the whole protocol, including reporting.
• Funding source(s).
• References.

Randomised controlled trials

The International Journal of Osteopathic Medicine has adopted the proposal from the International Committee of Medical Journal Editors (ICMJE) (see a recent Editorial in Manual Therapy http://www.sciencedirect.com/science/article/pii/S1356689X1200238X, Editorial: “Clinical trial registration in physiotherapy journals: Recommendations from the International Society of Physiotherapy Journal Editors”), which requires, as a condition of consideration for publication of clinical trials, registration in a public trials registry. Trials must register at or before the onset of patient enrolment. The clinical trial registration number should be included at the end of the abstract of the article in the final published version. For the peer review process however the clinical trial registration number should be included in the Conflict of Interest Statement (see below). For this purpose, a clinical trial is defined as any research project that prospectively assigns human subjects to intervention or comparison groups to study the cause and effect relationship between a medical intervention and a health outcome. Studies designed for other purposes, such as to study pharmacokinetics or major toxicity (e.g. phase I trials) would be exempt. Further information can be found at http://www.icmje.org. Clinical Trials that commence after 1st June 2013 must be registered to be considered for publication in the International Journal of Osteopathic Medicine. From January
2014 the International Journal of Osteopathic Medicine will not be able to accept any unregistered Clinical Trial papers. By 2015 the journal will not be able to publish any Clinical Trials that are unregistered prior to recruitment of the first participant.

Copyright
This journal offers authors a choice in publishing their research: Open Access and Subscription.

For Subscription articles
Upon acceptance of an article, authors will be asked to complete a ‘Journal Publishing Agreement’ (for more information on this and copyright, see https://www.elsevier.com/copyright). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a ‘Journal Publishing Agreement’ form or a link to the online version of this agreement. Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations (please consult https://www.elsevier.com/permissions). If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for by authors in these cases: please consult https://www.elsevier.com/permissions.

For Open Access articles
Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (for more information see https://www.elsevier.com/OAonAuthorLicense). Permitted reuse of open access articles is determined by the author's choice of user license (see https://www.elsevier.com/openaccesslicenses).

Retained author rights
As an author you (or your employer or institution) retain certain rights. For more information on author rights for:

Subscription articles please see https://www.elsevier.com/journal-authors/author-rights-and-responsibilities.

Open access articles please see https://www.elsevier.com/OAonAuthorLicense.

Elsevier supports responsible sharing
Find out how you can share your research published in Elsevier journals.

Role of the funding source
You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

This disclosure should be uploaded in the Conflict of Interest statement file in the final stages of manuscript submission (see above).

Open access
Please visit our Open Access page for more information.

Elsevier Researcher Academy
Researcher Academy is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The “Learn” environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.

Language (usage and editing services)
Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier’s Author Services.
2014 the International Journal of Osteopathic Medicine will not be able to accept any unregistered Clinical Trial papers. By 2015 the journal will not be able to publish any Clinical Trials that are unregistered prior to recruitment of the first participant.

**Copyright**

This journal offers authors a choice in publishing their research: Open Access and Subscription.

**For Subscription articles**

Upon acceptance of an article, authors will be asked to complete a ‘Journal Publishing Agreement’ (for more information on this and copyright, see [https://www.elsevier.com/copyright](https://www.elsevier.com/copyright)). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a ‘Journal Publishing Agreement’ form or a link to the online version of this agreement. Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations (please consult [https://www.elsevier.com/permissions](https://www.elsevier.com/permissions)). If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for by authors in these cases: please consult [https://www.elsevier.com/permissions](https://www.elsevier.com/permissions).

**For Open Access articles**

Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (for more information see [https://www.elsevier.com/OAauthoragreement](https://www.elsevier.com/OAauthoragreement)). Permitted reuse of open access articles is determined by the author's choice of user license (see [https://www.elsevier.com/openaccesslicenses](https://www.elsevier.com/openaccesslicenses)).

**Retained author rights**

As an author you (or your employer or institution) retain certain rights. For more information on author rights for:

Subscription articles please see [https://www.elsevier.com/journal-authors/author-rights-and-responsibilities](https://www.elsevier.com/journal-authors/author-rights-and-responsibilities).

Open access articles please see [https://www.elsevier.com/OAauthoragreement](https://www.elsevier.com/OAauthoragreement).

Elsevier supports responsible sharing

Find out how you can [share your research](https://www.elsevier.com) published in Elsevier journals.

**Role of the funding source**

You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

This disclosure should be uploaded in the Conflict of Interest statement file in the final stages of manuscript submission (see above).

**Open access**

Please visit our [Open Access page](https://www.elsevier.com) for more information.

**Elsevier Researcher Academy**

Researcher Academy is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.

**Language (usage and editing services)**

Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the [English Language Editing service](https://www.elsevier.com/authors/translation) available from Elsevier's Author Services.
Submission

Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word, LaTeX) are required to typeset your article for final publication. All correspondence, including notification of the Editor's decision and requests for revision, is sent by e-mail.

Submit your article


Suggesting reviewers

Please submit the names and institutional e-mail addresses of several potential reviewers.

You should not suggest reviewers who are colleagues, or who have co-authored or collaborated with you during the last three years. Editors do not invite reviewers who have potential competing interests with the authors. Further, in order to provide a broad and balanced assessment of the work, and ensure scientific rigor, please suggest diverse candidate reviewers who are located in different countries/regions from the author group. Also consider other diversity attributes e.g. gender, race and ethnicity, career stage, etc. Finally, you should not include existing members of the journal's editorial team, of whom the journal are already aware.

Note: the editor decides whether or not to invite your suggested reviewers.

PREPARATION

Submitted papers should be relevant to an international audience and authors should not assume knowledge of national practices, policies, law, etc. Authors should consult a recent issue of the journal for style if possible. Since the journal is distributed all over the world, and as English is a second language for many readers, authors are requested to write in plain English and use terminology which is internationally acceptable.

Abbreviations

Avoid the use of abbreviations unless they are likely to be widely recognised. In particular you should avoid abbreviating key concepts in your paper where readers might not already be familiar with the abbreviation. Any abbreviations which the authors intend to use should be written out in full and followed by the letters in brackets the first time they appear, thereafter only the letters without brackets should be used. Statistics - Standard methods of presenting statistical material should be used. Where methods used are not widely recognised explanation and full reference to widely accessible sources must be given.

Queries

For questions about the editorial process (including the status of manuscripts under review) or for technical support on submissions, please visit our Support Center.

References

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

However, should you wish to use the Vancouver numbered style adopted by the journal, full guidance is given below.

Review process

The decision to publish a paper is based on an editorial assessment and peer review. Initially all papers are assessed by an editor of the journal. The prime purpose is to decide whether to send a paper for peer review and to give a rapid decision on those that are not.

Manuscripts going forward to the review process are reviewed by members of an international expert panel. All such papers will undergo a double blind peer review by two or more reviewers. All papers are subject to peer review and the Journal takes every reasonable step to ensure author identity is concealed during the review process. The Editors reserve the right to the final decision regarding acceptance.
Double-blind peer review - This journal uses double-blind review, which means that both the reviewer and author name(s) are not allowed to be revealed to one another for a manuscript under review. The identities of the authors are concealed from the reviewers, and vice versa. To facilitate anonymity, the author’s names and any reference to their addresses should only appear on the title page.

Blinded manuscript (no author details): The main body of the paper (including the references, figures, tables) should not include any identifying information, such as the authors’ names or affiliations. Authors should also ensure that the place of origin of the work or study, and/or the organization(s) that have been involved in the study/development are not revealed in the manuscript – “X” can be used in the manuscript and details can be completed if the manuscript is processed further through the publication process.

Manuscript Layout
The manuscript with a font size of 12 or 10 pt double-spaced with wide margins (2.5 cm at least) and number pages consecutively beginning with the Title Page. Depending on the paper type (see above) this should include the title, abstract, key words, text, references, tables, figure legends, figures, appendix. Microsoft Word or similar programme should be used.
Please check your typescript carefully before you send it off, both for correct content and typographic errors. It is not possible to change the content of accepted typescripts during production.
To facilitate anonymity, the author’s names and any reference to their addresses should only appear on the title page. Please check your typescript carefully before you send it off, both for correct content and typographic errors. It is not possible to change the content of accepted typescripts during production.

Text
The text of observational and experimental articles is usually, but not necessarily, divided into sections with the headings; introduction, methods, results, results and discussion. In longer articles, headings should be used only to enhance the readability. Three categories of headings should be used:
- major headings should be typed in capital letter in the centre of the page and underlined (i.e. INTRODUCTION)
- secondary ones should be typed in lower case (with an initial capital letter) in the left hand margin and underlined (i.e. Participants).
- minor ones typed in lower case and italicised (i.e. questionnaire).

Do not use ‘he’, ‘his’ etc. where the sex of the person is unknown; say ‘the patient’ etc. Avoid inelegant alternatives such as ‘he/she’.

NEW SUBMISSIONS
Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts your files to a single PDF file, which is used in the peer-review process.

As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or layout that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission. Please note that individual figure files larger than 10 MB must be uploaded separately.

Formatting requirements
There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions and “Contribution of Paper” (where applicable).

If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.
Divide the article into clearly defined sections.

**Figures and tables embedded in text**
Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. Ensure that figures and tables are referred to in the body of the text and that they are clearly labelled.

**ALL SUBMISSIONS**
The following documents are needed for all submissions.

- **Title page** (with author details) - This should include the title, authors’ names and affiliations, and a complete address for the corresponding author including telephone and e-mail address.

- **Blinded manuscript** (no author details) - The main body of the paper (including the references, figures, tables) should not include any identifying information, such as the authors’ names or affiliations.

- **Covering letter** - to the editor in which you detail authorship contributions and other matters you wish the editors to consider.

**Implications for Practice**
At submission stage, authors of reviews and original research articles are required to provide three to four bullet points outlining what the manuscript adds to the literature. This should succinctly and accurately summarise the key new knowledge resulting from the study along with the implications for clinical, educational or research practice as appropriate for the focus of the manuscript. These should be placed after the Abstract and before the main body of the text.

**Essential title page information**
- **Title**. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
- **Author names and affiliations**. Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors’ affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lowercase superscript letter immediately after the author’s name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
- **Corresponding author**. Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**
- **Present/permanent address**. If an author has moved since the work described in the article was done, or was visiting at the time, a ‘Present address’ (or ‘Permanent address’) may be indicated as a footnote to that author’s name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

**GENERAL GUIDANCE**

**Abstract**
Both qualitative and quantitative research approaches should be accompanied by a structured abstract of no more than 250 words. Commentaries and Essays may continue to use text-based abstracts of no more than 150 words. All original articles should include the following headings in the abstract as appropriate: Background, Objective, Design, Setting, Methods, Participants, Results, and Conclusions. As an absolute minimum: Objectives, Methods, Results, and Conclusions must be provided for all original articles. Abstracts for reviews of the literature (in particular systematic reviews and meta-analysis) should include the following headings as appropriate: Objectives, Data Sources, Study Selection, Data Extraction, Data Synthesis, Conclusions. Abstracts for Case Studies should include the following headings as appropriate: Background, Objectives, Clinical Features, Intervention and Outcomes, Conclusions.

**Keywords**
Include four to ten keywords in alphabetical order, which accurately identify the paper's subject, purpose, method and focus. These should be indexing terms that may be published with the abstract with the aim of increasing the likely accessibility of your paper to potential readers searching the literature. Therefore, ensure keywords are descriptive of the study. Use the Medical Subject Headings (MeSH®) thesaurus or Cumulative Index to Nursing and Allied Health (CINAHL®) headings where possible (see http://www.nlm.nih.gov/mesh/meshhome.html).

Abbreviations- Avoid the use of abbreviations unless they are likely to be widely recognised. In particular you should avoid abbreviating key concepts in your paper where readers might not already be familiar with the abbreviation. Any abbreviations which the authors intend to use should be written out in full and followed by the letters in brackets the first time they appear, thereafter only the letters without brackets should be used.

Acknowledgments
One or more statements should specify (a) contributions that need acknowledging, but do not justify authorship (b) acknowledgments of technical support (c) acknowledgments of financial and material support, specifying the nature of the support. Persons named in this section must have given their permission to be named. Authors are responsible for obtaining written permission from those acknowledged by name since readers may infer their endorsement of the data and conclusions. Authors should include Acknowledgments in the Conflict of Interest statement at original submission stage, and will be required to transfer the Acknowledgments into the manuscript file for revised articles.

Statement of Competing Interests
When submitting a manuscript you will need to consider if you, or any of your co-authors, are an Editor or Editorial Board member of the International Journal of Osteopathic Medicine. If this is the case you will need to upload a Conflict of Interest statement at submission. Example statement, which may require editing, is as follows: {Name of author} is an Editor of the Int J Osteopath Med; {Name of author} is a member of the Editorial Board of the Int J Osteopath Med but was not involved in review or editorial decisions regarding this manuscript.

Formatting of funding sources
List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Artwork

File Formatting for Artwork & Illustrations - General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Save text in illustrations as “graphics” or enclose the font.
- Only use the following fonts in your illustrations: Arial, Courier, Times, Symbol.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Produce images near to the desired size of the printed version.
- Submit each figure as a separate file.

A detailed guide on electronic artwork is available on our website: https://www.elsevier.com/artworkinstructions

Please do not:

AUTHOR INFORMATION PACK 21 Jan 2022 www.elsevier.com/locate/i josm 16
- Supply embedded graphics in your word processor (spreadsheet, presentation) document.
- Supply files that are optimised for screen use (like GIF, BMP, PICT, WPG); the resolution is too low.
- Supply files that are too low in resolution.
- Submit graphics that are disproportionately large for the content.

**Electronic artwork**

**General points**
- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.
- Ensure that color images are accessible to all, including those with impaired color vision.

A detailed guide on electronic artwork is available.

**You are urged to visit this site; some excerpts from the detailed information are given here.**

**Formats**
If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.
Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):
- EPS (or PDF): Vector drawings, embed all used fonts.  
- TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.  
- TIFF (or JPEG): Bitmaped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi.  
- TIFF (or JPEG): Combinations bitmapped line/halftone (color or grayscale), keep to a minimum of 500 dpi.

**Please do not:**
- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

**Tables, Illustrations and Figures**
Tables, Illustrations and figures should be placed on separate pages as separate electronic files and not placed within the manuscript. Each table, illustration or figure should be accompanied by a number (e.g. Table 1) and a brief description of the content of the table, figure or illustration, below the table, illustration or figure. All tables, illustrations or figures should be referred to in the manuscript.

**Illustrations and tables that have appeared elsewhere** must be accompanied by written permission to reproduce them from the original publishers. This is necessary even if you are an author of the borrowed material. Borrowed material should be acknowledged in the captions in the exact wording required by the copyright holder. If not specified, use this style: 'Reproduced by kind permission of ... (publishers) from ... (reference)'. Identifiable clinical photographs must be accompanied by written permission from the patient.

**References**
Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Citation of a reference as 'in press' implies that the item has been accepted for publication.

**Reference links**
Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is highly encouraged.

**AUTHOR INFORMATION PACK 21 Jan 2022**  www.elsevier.com/locate/josm
A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation using DOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambehe W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. Journal of Geophysical Research, https://doi.org/10.1029/2001JB000884. Please note the format of such citations should be in the same style as all other references in the paper.

**Web references**
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

**Data references**
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

**Reference management software**
Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley. Using citation plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes from different reference management software.

**Reference style**
Text: Indicate references by number(s) in square brackets in line with the text. The actual authors can be referred to, but the reference number(s) must always be given.

**List:** Number the references (numbers in square brackets) in the list in the order in which they appear in the text.

**Examples:**
Reference to a journal publication:
Reference to a book:
Reference to a chapter in an edited book:
Reference to a website:
[4] Cancer Research UK. Cancer statistics reports for the UK, http://www.cancerresearchuk.org/aboutcancer/statistics/cancerstatsreport/, 2003 [accessed 13.03.03]. Note shortened form for last page number. e.g., 51–9, and that for more than 6 authors the first 6 should be listed followed by ‘et al.’ For further details you are referred to ‘Uniform Requirements for Manuscripts submitted to Biomedical Journals’ (J Am Med Assoc 1997;277:927–34) (see also Samples of Formatted References).

**Data visualization**
Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions here to find out about available data visualization options and how to include them with your article.

**Research data**
This journal encourages and enables you to share data that supports your research publication where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods and other useful materials related to the project.

AUTHOR INFORMATION PACK 21 Jan 2022 www.elsevier.com/locate/ijosm 18
Below are a number of ways in which you can associate data with your article or make a statement about the availability of your data when submitting your manuscript. If you are sharing data in one of these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to the "References" section for more information about data citation. For more information on depositing, sharing and using research data and other relevant research materials, visit the research data page.

**Data linking**

If you have made your research data available in a data repository, you can link your article directly to the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with relevant repositories, giving readers access to underlying data that gives them a better understanding of the research described.

There are different ways to link your datasets to your article. When available, you can directly link your dataset to your article by providing the relevant information in the submission system. For more information, visit the database linking page.

For supported data repositories a repository banner will automatically appear next to your published article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053; PDB: 1XFN).

**Mendeley Data**

This journal supports Mendeley Data, enabling you to deposit any research data (including raw and processed data, video, code, software, algorithms, protocols, and methods) associated with your manuscript in a free-to-use, open access repository. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to Mendeley Data. The datasets will be listed and directly accessible to readers next to your published article online.

For more information, visit the Mendeley Data for journals page.

**Data statement**

To foster transparency, we encourage you to state the availability of your data in your submission. This may be a requirement of your funding body or institution. If your data is unavailable to access or unsuitable to post, you will have the opportunity to indicate why during the submission process, for example by stating that the research data is confidential. The statement will appear with your published article on ScienceDirect. For more information, visit the Data Statement page.

**Interactive Case Insights**

The journal encourages authors to complement their case reports with test questions that reinforce the key learning points. These author created questions are submitted along with the article (new or revised) and will be made available in ScienceDirect along with your paper. More information and examples are available at https://www.elsevier.com/about/content-innovation/interactive-case-insights. Test questions are created online at http://elsevier-apps.sciverse.com/GadgetICRWeb/verification. Create the test questions, save them as a file to your desktop, and submit along with your (new or revised) manuscript through Editorial Manager. For questions, please contact icihelp@elsevier.com.

Please check the manuscript carefully before it is sent off to the Editorial Office, both for correct content and typographical errors, as it is not possible to change the content of accepted typescripts during the production process. As a guide, please ensure the following had been included:

- One copy of manuscript and;
- Tables, figures and illustrations, uploaded separately and correctly labelled;
- Reference list in correct style and correct in-text referencing;
- Written permission from original publishers and authors to reproduce any borrowed any borrowed material (where relevant).

**Statistics**

Statistics - Standard methods of presenting statistical material should be used. Where methods used are not widely recognised explanation and full reference to widely accessible sources must be given.

AUTHOR INFORMATION PACK 21 Jan 2022  www.elsevier.com/locate/ijsonm  19
REVISED SUBMISSIONS

At revision stage the following documentation is required:
• a separate "Response to Reviewers" file – Responses to the reviewers' and editors' comments.
• a revised blinded manuscript with changes clearly highlighted.

Revised submissions should be accompanied by a letter which responds point by point to the reviewers' and editors' comments, and changes to the revised paper should be highlighted so they can be spotted easily by the reviewers to whom the paper is normally returned for further review/comment.

Use of word processing software
Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier: https://www.elsevier.com/guidetopublication). See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

AFTER ACCEPTANCE

Online proof correction
To ensure a fast publication process of the article, we kindly ask authors to provide us with their proof corrections within two days. Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.

If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.

We will do everything possible to get your article published quickly and accurately. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. It is important to ensure that all corrections are sent back to us in one communication. Please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

Offprints
The corresponding author will, at no cost, receive a customized Share Link providing 50 days free access to the final published version of the article on ScienceDirect. The Share Link can be used for sharing the article via any communication channel, including email and social media. For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier's Author Services. Corresponding authors who have published their article gold open access do not receive a Share Link as their final published version of the article is available open access on ScienceDirect and can be shared through the article DOI link.

AUTHOR INQUIRIES

Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.

You can also check the status of your submitted article or find out when your accepted article will be published.
Appendix B: Survey Questionnaire

Eligibility Questions

* 1. Are you a registered osteopath currently working in New Zealand?
   ○ Yes
   ○ No

* 2. Have you practised osteopathy in New Zealand for at least two years (this includes clinical training as well)?
   ○ Yes
   ○ No

* 3. Do you consult for chronic low back pain on a regular basis?
   ○ Yes
   ○ No
Demographic Information

4. What is your age?

☐ 20-29
☐ 30-39
☐ 40-49
☐ 50-59
☐ 60+
☐ Rather not say

5. Please state your gender (or leave blank if you would prefer not to say).

[Blank space]

6. What is your highest qualification?

☐ Diploma
☐ Advanced diploma
☐ Bachelor's (or Double Bachelor's) degree
☐ Postgraduate certificate or diploma
☐ Master's degree
☐ Doctorate

7. Do you carry an extended scope of practice with the Osteopathic Council of New Zealand?

☐ Yes
☐ No

8. If you answered ‘yes’ to question 7, please specify what scope(s) of practice you have.

[Blank space]

9. How many years have you been practising osteopathy?

☐ 2-5 years
☐ 6-10 years
☐ 11-15 years
☐ 16-20 years
☐ >20 years
10. Are you involved in any other occupational roles or memberships?

☐ Lecturing at tertiary institutions
☐ Clinical supervision of students
☐ Clinical supervision of associates
☐ Osteopaths New Zealand membership
☐ Osteopathy Research Connect New Zealand, practice based research network membership
☐ Research
☐ Other
☐ I have no other occupational roles or memberships

11. If you answered 'other' to question 10, please state what other roles or memberships you have.

[Blank space]
Use of Patient-Reported Outcome Measures

**Patient-Reported Outcome Measures** are instruments used to assess patients' perspective of their own health status without interpretation by anyone else.

12. How often have you used the following Patient-Reported Outcome Measures with patients experiencing chronic low back pain in the past six months?

<table>
<thead>
<tr>
<th>Measure</th>
<th>Always</th>
<th>Very often</th>
<th>Often</th>
<th>Seldom</th>
<th>Very seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roland-Morris Disability Questionnaire (RMDQ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oswestry Low Back Pain Disability Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient-Specific Functional Scale (PSFS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quebec Back Pain Disability Scale (DBPDS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain Visual Analogue Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numeric Pain Rating Scale (NPRS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36-Item Short-Form Survey (SF-36)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-Item Short Form Survey (SF-12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tampa Scale for Kinesiophobia (TSK)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. If you ticked 'other', please name the additional Patient-Reported Outcome Measures that you have used in the past six months.

[Blank space for response]
Barriers and Facilitators

If you never use Patient-Reported Outcome Measures for managing chronic low back pain, please skip to question 34. If you do use Patient-Reported Outcome Measures, please indicate how strongly you agree or disagree with the following statements by clicking on the sliders below.

16. I am confident that I can use Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

[Sliders for Strongly disagree and Strongly agree]

17. I am familiar with the objectives of using Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

[Sliders for Strongly disagree and Strongly agree]

18. I know how to apply Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

[Sliders for Strongly disagree and Strongly agree]

19. I have the skills to use Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

[Sliders for Strongly disagree and Strongly agree]

20. Using Patient-Reported Outcome Measures in the management of patients with chronic low back pain is something that I do automatically.

[Sliders for Strongly disagree and Strongly agree]
21. I often forget to use Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

22. There is enough time to use Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

23. I generally feel comfortable using Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

24. The resources that I need to help me use Patient-Reported Outcome Measures in the management of chronic low back pain are available.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

25. It is my responsibility as an osteopath to use Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

26. Many healthcare practitioners whose opinion I value think that I should use Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

27. I have a strong intention to use Patient-Reported Outcome Measures in the management of patients with chronic low back pain in the next three months.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>
28. I have a clear plan for how I will use Patient-Reported Outcome Measures in the management of patients with chronic low back pain.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

29. With regards to using Patient-Reported Outcome Measures in the management of patients with chronic low back pain, I feel optimistic about the benefits for patients.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

30. Using Patient-Reported Outcome Measures in the management of patients with chronic low back pain is useful and has many advantages for patients.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

31. Whenever I use Patient-Reported Outcome Measures in the management of patients with chronic low back pain, I feel like I am making a difference.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

32. What benefits have you observed from using Patient-Reported Outcome Measures in the management of chronic low back pain?

   

33. In your experience, what are some of the disadvantages of using Patient-Reported Outcome Measures in the management of patients with chronic low back pain?

   

34. What prevents you from using Patient-Reported Outcome Measures in the management of patients with chronic low back pain?

   

Appendix C: Participant Information Sheet

Participant Information Sheet

Kia ora, my name is Evania Vallyon. I am currently enrolled in the Master of Osteopathy at Unitec Institute of Technology, Auckland, and seek your help in meeting the requirement for research which forms a substantial part of this degree.

The purpose of my project is to investigate New Zealand osteopaths’ experience using (and not using) Patient-Reported Outcome Measures for the management of chronic low back pain. To do this, I would like to invite you to fill out a questionnaire that takes approximately 10-15 minutes to complete. The questionnaire commences with three eligibility questions before progressing to the topic at hand. Eligible survey participants can go in the draw to win one of three $100 cash prizes. An email link is provided at the end of the survey for those who wish to enter the draw.

Please rest assured that neither you nor your organisation will be identified within the Thesis. Although participants who enter the draw will need to supply their email address, survey data will remain completely anonymous. All data will be stored on a password-protected file that only you, myself and my two supervisors will have access to. If you wish, you may ask to see the Thesis before it is submitted for examination.

By filling out the survey, you are consenting that any information given on that survey may be used in this research project. I hope that you find this invitation of interest, however participation is voluntary. If you have any questions or concerns about this study, please contact my supervisors at Unitec.

My supervisors are:
Dr Saeideh Aminian, contactable at saminian@unitec.ac.nz
Dr Samantha Health, contactable at sheath@unitec.ac.nz

UREC REGISTRATION NUMBER: 2021-1019

This study has been approved by the UNITEC Research Ethics Committee from 24/06/2021 to 28/02/2021. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8531). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix D: Participant Invitations

Invitation to participate in ORC-NZ sub-study: New Zealand osteopaths’ use of Patient-Reported Outcome Measures for chronic low back pain

Dear ORC-NZ member,

We seek your input on a survey that investigates New Zealand osteopaths’ use of Patient-Reported Outcome Measures for the management of chronic low back pain. You are invited as a valued member of the Osteopathy Research Connect New Zealand (ORC-NZ) project. Patient-Reported Outcome Measures (PROMs) are advocated for use with patients experiencing chronic pain, yet implementation is complex. For this reason, there is a need to investigate New Zealand osteopaths’ experience and perspectives on using the measures. Findings may support critical appraisal of PROM’s appropriateness for the osteopathic management of chronic low back pain. They may also inform future implementation (if appropriate).

Participation in the survey is voluntary and takes approximately 10-15 minutes to complete. All survey participants can go in the draw to win one of three $100 cash prizes. Instructions are provided at the end of the survey for those who wish to join. Although participants who enter the draw will need to supply their email address, survey data will remain completely anonymous. All data will be stored on a password-protected file that only you and the research team will have access to.

By filling out the survey, you are consenting that any information given on that survey may be used in this research project. The survey can be accessed via the following link:
https://www.surveymonkey.com/r/LBP_PROMs

Survey on NZ Osteopaths’ Use of Patient-Reported Outcomes
Share your experience using Patient-Reported Outcome Measures and win $100!
www.surveymonkey.com

Master of Osteopathy candidate, Evania Vallyon, and supervisors Dr Saeideh Aminian and Dr Samantha Heath are conducting this study. If you have any questions or concerns about the study, please contact Dr Saeideh Aminian at saminian@unitec.ac.nz. Your participation is much appreciated.

UREC REGISTRATION NUMBER: 2021-1019
This study has been approved by the UNITEC Research Ethics Committee from 24/06/2021 to 28/02/2021. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Dear Osteopath,

I recently invited you to participate in a survey on New Zealand osteopaths’ use of Patient-Reported Outcome Measures for chronic low back pain. I greatly appreciate your time if you have already filled out the survey, and I hope you win one of those cash prizes. If you are still finding time to fill out the survey, please find the link below. You still have an opportunity to win one of three $100 cash prizes, as these will be drawn next week.

Please rest assured that neither you nor your organisation will be identified within the Thesis. Although participants who enter the draw will need to supply their email address, identifiers will remain separate from data collected in the surveys. All survey data will, in effect, remain completely anonymous. All data will be stored on a password-protected file that only you, myself and my two supervisors will have access to. If you wish, you may ask to see the Thesis before it is submitted for examination.

By filling out the survey, you are consenting that any information given on that survey may be used in this research project. The survey itself can be accessed via the following link:
https://www.surveymonkey.com/r/LBP_PROMs

I hope that you find this invitation of interest. If you have any questions or concerns about this study, please contact my supervisors at Unitec.

My supervisors are:
Dr Saeideh Aminian, contactable at saminian@unitec.ac.nz
Dr Samantha Health, contactable at sheath@unitec.ac.nz

UREC REGISTRATION NUMBER: 2021-1019
This study has been approved by the UNITEC Research Ethics Committee from 24/06/2021 to 28/02/2021. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Kind regards,
Evania
Appendix F: ORC-NZ Sub-study EOI Application

ORC-NZ Project Sub-study Expression of Interest (EOI) Application

Use this form if you are proposing to conduct a sub-study with ORC-NZ participants.

Have you discussed this proposal with an ORC-NZ Project Chief Investigator?

Yes ☒ No ☐

All sub-studies must be discussed with the ORC-NZ Project team via Dr Amie Steel (Amie.Steel@uts.edu.au) Distinguished Prof Jon Adams (Jon.Adams@uts.edu.au) at UTS before filling out this form. Please see our sub-study proposal policy and guidelines as available on the ORC-NZ website at: http://www.ORC-NZ-arccim.com/

Section A

| Name, title, email address and institution of Project Leader (lead person) | Dr Saeideh Aminian  
|saminiun@unitec.ac.nz  
|Unitec Institute of Technology |
|Corresponding ORC-NZ liaison & contact details (If ORC-NZ liaison is also a collaborator please list below) | Amie Steel |
|Other Sub-Study Collaborators (include title, email address and institution) | n/a |
|Detailed scientific title of potential project | New Zealand Osteopaths’ Use of Patient-Reported Outcome Measures for Chronic Low Back Pain |
|Is this research the project of a student? (will the project contribute to their award)? | Yes ☒ No ☐ |
|If yes what percentage will this project contribute to their final award? (For example if their project is based entirely on ORC-NZ data this would be 100%) | 100% |
|If yes, please provide student’s name, course (level of award Bachelor, Masters, PhD, etc), institution, course start date and expected completion date | Evania Vallyon  
|Master of Osteopathy  
|Unitec Institute of Technology  
|Course start date: 2018  
|Expected completion date: 2022 |
Please list supervisors

<table>
<thead>
<tr>
<th>Principal Supervisor: Dr Saeideh Aminian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Supervisor/s: Dr Samantha Heath</td>
</tr>
</tbody>
</table>

Does this new EOI supersede a current or previous ORC-NZ EOI?

Yes  [ ]  No  [x]

If yes, please provide details of which EOI it supersedes and confirm whether the EOI it supersedes can now be made inactive

n/a

Please provide a lay synopsis of your proposed project (75-100 words) that can be published on the ORC-NZ Project website if the project is approved. (This synopsis may also be included in ORC-NZ newsletters to participants and wider community.)

Patient-Reported Outcome Measures (PROMs) are advocated for use in clinical practice because they provide unbiased reporting of key outcomes affecting patients’ daily lives [7,92]. Whereas evidence [127,177,178,202,203,217] exists to support other healthcare practitioners’ uptake of PROMs for low back pain, no such support exists among New Zealand osteopaths. Low back pain is a leading presentation at osteopathy clinics [126,278] so this is worthy of investigation. This study investigates New Zealand osteopaths’ use of PROMs with patients experiencing chronic low back pain, with an interest in osteopaths’ views on barriers and facilitators to use to inform future implementation (if appropriate).

Outline of sub-study (in no more than 700 words):

Background and Rationale

Patient-Reported Outcome Measures (PROMs) are advocated for use in clinical practice because they provide accurate and unbiased reporting of patients’ subjective outcomes (e.g., pain, function and health-related quality of life) [7,92], and added potential for patient-centred care [279]. Although several knowledge-translation studies [127,177,178,202,203,217] investigate healthcare practitioners’ uptake of PROMs for non-specific low back pain (LBP), not one is specific to New Zealand osteopaths. Given the prevalence of low back pain at osteopathy clinics (9,10), there is cause to investigate New Zealand osteopaths’ use of the measures.

The proposed research asks:

- To what extent do New Zealand osteopaths use Patient-Reported Outcome Measures with patients experiencing chronic low back pain?
- What are the potential barriers and facilitators to the use of Patient-Reported Outcome Measures with patients experiencing chronic low back pain, from the perspective of New Zealand osteopaths?

Methods

Research Design

A cross-sectional survey has been selected to investigate the research questions. To our knowledge, no existing questionnaire adequately addresses the research questions so five questionnaires have been combined and adapted for use [177,178,217,258,259]. The resulting modified questionnaire (Appendix A) consists of four parts (Eligibility Questions; Demographic Information; Extent of PROMs Use; Barriers and Facilitators to PROMs use) and is estimated to take 10-15 minutes to complete.
**Sampling and participants**

The inclusion criteria are:

1. Participants must carry a current Annual Practicing Certificate (APC) with the Osteopathic Council of New Zealand (OCNZ)
2. Participants must have practiced in New Zealand for at least two years
3. Participants must consider that they consult for chronic low back pain on a regular basis.

For a probability sample of New Zealand osteopaths carrying current APCs (16), 61-225 participants must complete the survey (17, 18). Fine-tuning of this number will depend on participants’ response rates along with finalised margin of error and confidence levels.

With consent from the ORC-NZ team, participants will be recruited from both the ORC-NZ practice-based research network (PBRN) and New Zealand’s wider osteopathic profession (16). This combined approach mitigates any bias associated with osteopaths in the PBRN being more given to evidence-informed practices than the general osteopathic population, without foregoing the potential for a good response rate from the PBRN itself.

A participant information sheet and survey link will be provided to the ORC-NZ team for emailing to the PBRN.

**Procedures**

The modified questionnaire (Appendix A) is being hosted on SurveyMonkey® (CA, USA) for pilot testing with tutors who have varied experience of using (and not using) PROMs. Completion rates may be improved (15) by asking tutors to identify areas that are in need of revision.

As mentioned, participants will be provided with a ‘Participant Information Sheet’ (Appendix B) informing them that their response implies consent. Consenting participants will be invited to click a link to answer eligibility questions.

**Data Analysis**

Survey data will be extracted from SurveyMonkey® and exported to a Microsoft Excel spreadsheet for data cleaning and review. The data will then be preferably imported into SPSS Version 25 (SPSS Inc., Chicago IL, USA) for analysis.

Descriptive statistics (means and standard deviations) and frequencies will be calculated where appropriate. General themes from the open-ended questions will be identified and utilised to generate frequencies. After testing the normality of data, Spearman’s rank-order correlation will be conducted to assess the relationship between non-parametric individual Likert-scale questions (ORC-NZ PBRN membership, scope of practice, level of qualification, and years of experience), and Pearson’s r correlation will be used to examine the relationship between normally distributed overall Likert scale scores.

**Significance**

This research offers practical benefit insofar as it may inform future implementation of PROMs in osteopathic practice, if appropriate. Individual osteopaths may use findings to inform reflections on their own use of the measures.
| Ethical considerations: | Participant confidentiality is protected by ensuring participants’ anonymity as well as due data security for the gathered information. Participant care will be facilitated through a ‘Participant Information Sheet’ (Appendix B).

The anonymity of participants’ responses is protected in various ways. The survey itself (Appendix A) does not enquire after personal identifiers. Although the survey host, SurveyMonkey® (CA, USA), does collect personal identifiers, settings will be used to ensure the anonymity of participants’ responses (13). While SurveyMonkey® will be used to track email invitations (so that reminders can be sent), it will not tie this tracking to the survey results (14). For this reason, the responses themselves will remain anonymous.

Privacy is ensured through careful attention to data storage and security. Gathered information will be stored on a password-protected laptop and backed-up on the password-protected cloud storage called Mega, which achieves privacy through end-to-end encryption (24, 25). Only the researcher and supervisors will have access to the stored data. Any hardcopy data produced during this study will be kept locked in a cabinet in the principal supervisor’s office, which is onsite Building 60 at Unitec. Hard and soft copy data relating to the participants will be shredded and deleted after 5 years.

The study has been approved by the Unitec Research Ethics Committee at the Unitec Institute of Technology (2021-1019).

| Participant confidentiality & care Institutions where clearance will be sought Status of ethics applications |
|---|---|
| Participant confidentiality is protected by ensuring participants’ anonymity as well as due data security for the gathered information. Participant care will be facilitated through a ‘Participant Information Sheet’ (Appendix B).

The anonymity of participants’ responses is protected in various ways. The survey itself (Appendix A) does not enquire after personal identifiers. Although the survey host, SurveyMonkey® (CA, USA), does collect personal identifiers, settings will be used to ensure the anonymity of participants’ responses (13). While SurveyMonkey® will be used to track email invitations (so that reminders can be sent), it will not tie this tracking to the survey results (14). For this reason, the responses themselves will remain anonymous.

Privacy is ensured through careful attention to data storage and security. Gathered information will be stored on a password-protected laptop and backed-up on the password-protected cloud storage called Mega, which achieves privacy through end-to-end encryption (24, 25). Only the researcher and supervisors will have access to the stored data. Any hardcopy data produced during this study will be kept locked in a cabinet in the principal supervisor’s office, which is onsite Building 60 at Unitec. Hard and soft copy data relating to the participants will be shredded and deleted after 5 years.

The study has been approved by the Unitec Research Ethics Committee at the Unitec Institute of Technology (2021-1019).

<table>
<thead>
<tr>
<th>Expected outcomes &amp; likely target audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apart from completion of a research thesis, a key expected outcome is the study’s publication in a peer reviewed journal (e.g., The International Journal of Osteopathic Medicine). The primary target audience includes osteopaths and/or those interested in assessing the appropriateness of PROMs to osteopathic practice. Researchers and/or policy leaders who are interested in implementing PROMs may also benefit from the findings of this study.</td>
</tr>
</tbody>
</table>
### Timeline for the project

Include:
- Start date
- Ethics clearance dates
- Recruiting start date
- Expected conclusion of data collection
- Expected outcomes date (e.g. paper submission date)

| Start date: The research proposal was approved on 18\textsuperscript{th} May 2021. Ethics clearance was given on 24\textsuperscript{th} June 2021, issuing the official start of the study. |
| Recruitmen will commence as soon as we hear back on whether this EoI sub-study application is approved. Data collection will last approximately three months, concluding on 30\textsuperscript{th} October 2021. |
| Regarding outcomes, the current aim is to complete the research thesis by 28\textsuperscript{th} February 2022. A manuscript will be submitted to the International Journal of Osteopathic Medicine in the six months following completion of the research thesis. |

#### How do you expect to fund this work?
(Describe source and amount)

| Unitec osteopathy students who are enrolled in HEAL9312 can apply for funding. I have applied for $300 to cover 3x $100 cash prizes to encourage participation in the survey. |

#### Budget
(Develop with assistance of ORC-NZ staff)

| n/a – the project has no costs beyond the 3x $100 cash prizes mentioned above. |

#### Core ORC-NZ staff who will assist & the tasks agreed upon (Develop with assistance of ORC-NZ staff)

| Amie Steel  
Danielle Brown  
Tasks: As per the email communications with Amie Steel, we will provide recruitment material to Amie and Danielle. They will then email it out to relevant members of the PBRN. |

#### Names and email addresses of all people who will have access to the raw data for analysis purposes

| Evania Vallyon  
evallyon@runbox.com  
Saeideh Aminian  
saminian@unitec.ac.nz  
Samantha Heath  
sheath@unitec.ac.nz |

#### Who will provide the substantive expertise and input for this sub-study?

| Evania Vallyon |

#### Who will provide statistical expertise and input?

| Saeideh Aminian |

#### Who will provide qualitative research and analysis expertise if required?

| Saeideh Aminian and Samantha Heath |
Section B

For all investigators/supervisors listed in Section A, please provide a one-page CV including qualifications, any publications and grants, research experience and any other information deemed relevant for this sub-study.

These are included as three separate attachments alongside this EoI form.

Upon completion, please submit both this form and any accompanying documentation to arccim@uts.edu.au and clearly mark the subject heading of the email ‘ORC-NZ Sub-study EOI Submission – SURNAME of Project Leader (i.e. Jones)’