International Journal of Osteopathic Medicine 31 (2019) 7–14

Contents lists available at ScienceDirect

International Journal of Osteopathic Medicine

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

Original Article

Complementing or conflicting? A qualitative study of osteopaths' perceptions of NICE low back pain and sciatica guidelines in the UK

John Inman, Oliver P. Thomson*

The University College of Osteopathy, 275 Borough High Street, London, United Kingdom

ARTICLE INFO

Keywords:
Low back pain
Osteopathy
Osteopathic Medicine
Clinical guidance
Evidence-based practice
Clinical decision-making

ABSTRACT

Objectives: Clinical practice guidelines (CPGs) have been developed to improve standards of healthcare delivery and are associated with better clinical outcomes. In the UK, the National Institute for Health and Care Excellence (NICE) produced guidelines for the treatment of low back pain and sciatica. However, guideline resistant attitudes have been demonstrated by healthcare professionals, including osteopaths.

Methods: A qualitative study design was chosen, utilising constructivist grounded theory method as a framework to explore osteopaths' perceptions of NICE low back pain and sciatica guidelines in the UK. Seven participants were interviewed, with their interviews transcribed and coded.

Results: Osteopaths' perceptions of NICE Low Back Pain and Sciatica guidelines are influenced by their conception of uncertainty in the clinical environment, their views of knowledge, approach to clinical decision-making and their professional identity.

Conclusions: Osteopaths' views of NICE low back pain and sciatica guidelines are varied. Some of these views of LBP guidelines may act as obstacles to their implementation. Pre- and post- osteopathy registration educational strategies should aim to facilitate positive attitudes towards the use of clinical guidance abd the utilisation CPGs in clinical practice.

Introduction

Clinical practice guidelines (CPGs) may be defined as "systematically developed statements to assist both practitioner and patient decisions about appropriate healthcare for specific clinical circumstances" [1] p.8). CPGs have been widely accepted as a method to support healthcare professionals (HCPs) to implement evidence-based practice (EBP). EBP is the explicit use of most recent and best evidence from research to aid patient-centred decision-making, improve clinical outcomes, enhance patient experience, and justify interventions and treatment [2,3]. In the United Kingdom (UK), the National Institute for Health and Care Excellence (NICE) produces CPGs for the diagnosis and treatment of specific conditions [4]. In 2009, NICE published CPGs for Non-Specific Low Back Pain (NSLBP) that were updated in 2016. The most recent NICE guidelines offer clinical guidance for assessment and treatment of NSLBP and sciatica, including recommendations for pharmacological management, exercise and manual therapy [5]. New recommendations also included the use of risk stratification questionnaires for biomedical, psychological and social risk factors for low back pain disability and advise that manual therapy only be delivered as a 'package of care' combined with exercise with or without psychological therapy [5].

NSLBP is defined as pain located between the twelfth rib and gluteal folds, not attributed to a clearly identifiable and specific biomedical pathology [6]. It is a leading cause of disability worldwide, accounting for the most years lived with disability more than any other condition [28]. NSLBP places a substantial economic burden on private and public healthcare providers worldwide [7,8]. Direct costs for the provision of care to address NSLBP in the UK have previously been estimated at £11 billion, 51% of which was attributed to costs in primary care, physiotherapy and allied health professions [9]. Additional costs associated with NSLBP include lost income, social exclusion and reduced quality of life [8]. With an ageing population, the prevalence of NSLBP is predicted to increase and these costs are expected to rise, necessitating practice which is both clinically and cost effective [8,10,11].

Osteopaths are providers of manual therapy, exercise, self-management and lifestyle advice, which are interventions recommended in the most recent NICE NSLBP and sciatica guidelines [5]. Practitioners are frequently consulted for management of spinal symptoms, with NSLBP the most common symptom presented to osteopaths in the UK [12]. There is debate regarding the most effective treatment of NSLBP,

* Corresponding author. Research Centre, The University College of Osteopathy, 275 Borough High Street, London, United Kingdom.
E-mail address: Oliver.thomson@uco.ac.uk (O.P. Thomson).

https://doi.org/10.1016/j.ijosm.2019.01.001
Received 30 May 2018; Received in revised form 3 January 2019; Accepted 4 January 2019

as no one treatment modality is considered to demonstrate significant benefits over others [6]. However, treatment following NSLBP guideline recommendations has shown clinical and economical benefit compared with non-standardised treatment [13–15].

Research examining NSLBP CPGs has revealed barriers to their use in practice. Firstly, adhering to recommendations within the CPGs can be challenging due to financial and time constraints on practitioners and conflict of guideline recommendations with the patient's values and treatment expectations [16–18]. HCPs may feel NSLBP guidelines interfere with the practitioner-patient relationship, challenging their autonomy and professional judgement [19–23]. Mercuri et al., [24] found that a practitioner's level of expertise, defined in this case as participants with more than 5 years' experience post qualification, influenced CPG adherence. Even when CPGs are known and expected to be implemented, experienced HCPs were more likely not to follow them in order to adapt to the context of individual patients when compared with novice practitioners [24]. This suggests the amount of clinical experience may influence HCPs utilization and adherence to CPGs, as some clinicians may override recommendations by relying on their experience to address the perceived unique social context of the individual patient [24]. In addition to these obstacles, NSLBP guidelines have been viewed as legitimising certain professional groups and treatments over others [25]. Professions whose treatment modalities are recommended in the CPGs are given a mandate for their interventions and supported by the provision of financial resources, whilst professional groups whose interventions are not included in CPGs perceive their role to be curtailed [25].

Since the inception of EBP in the early 1990s, authors have provided a number of criticisms of the EBP model [26] and subsequent use of CPGs in clinical practice. Greenhalgh et al., [27] proposed that overemphasis on adherence to algorithmic rules has led to difficulty applying EBP in practice. Assumptions of patient uniformity can restrict the utility of CPGs for clinicians dealing with patients who have complex multi-morbidities and can also lead to less patient-centred care. As a result of these obstacles, implementation of NSLBP guidelines by musculoskeletal HCPs is inconsistent, which may result in inappropriate care, such as reduced use of conservative treatments and unnecessary referrals for imaging and surgical interventions [28,29]. Although interventions have been conducted to change clinicians' usage of CPGs, passive dissemination of guidelines has been ineffective in changing behaviour [30]. Although educational interventions to modify peer group norms have been purported to be an effective method of altering HCP's practice behaviour [31], a systematic review [32] found no clear superior strategy at engendering behaviour change. Furthermore, it has been recognised that education can influence HCPs NSLBP management, as practitioners that favour biomedical diagnoses for NSLBP can be less likely to adhere to CPGs [33,34]. Enhancing understanding of practitioners' perceptions of NICE NSLBP and sciatica guidelines could potentially aid educational and regulatory institutions understanding and management of obstacles to CPG use.

Despite osteopathy generally being considered a profession with a set of unifying theoretical and philosophical principles, osteopaths' approaches to clinical practice and professional identities are diverse [35–38]. Professional identity can be defined as the enduring constellation of attributes, beliefs, values and experiences in terms of which people define themselves in a professional role [39]. Practitioners' identification with the ‘osteopathic principles’ which are often claimed to underpin osteopathic practice [40], is varied; with a contrast between those who view the philosophy as intrinsic to practice and others who see the principles as a restriction due to their lack of evidence base, instead describing osteopathy as a manual therapy with a philosophical background [35]. These different approaches are influenced by educational factors, views regarding the philosophy of osteopathy and the practitioners' perceived therapeutic role [35–38,41].

Moreover, there is diversity regarding UK osteopaths' conceptions of practice. This can be understood as how practitioners view their knowledge, skills and the nature of their practice [38]. This can range from ‘technical rationality’ to ‘professional artistry’, with the particular conception adopted by practitioners influencing their clinical decision-making, therapeutic focus and clinical approach [36,38]. Given the wide-ranging views and approaches within osteopathy, examining perceptions of the NICE NSLBP and sciatica guidelines could be beneficial to educational institutions looking to promote evidence-based approaches in their training programs as osteopathic students' professional identities are constructed during their education [42].

There is limited research investigating osteopaths' attitudes to NSLBP CPGs. Weber and Rajendran [43] conducted a survey of UK osteopaths examining their relationship with EBP. This revealed that two thirds of respondents did not actively seek CPGs applicable to them and more than half did not use guidelines in their clinical practice, with comparative usage previously found to be higher in physiotherapists and other allied health professionals [44,45]. Similarly, a national survey of UK osteopaths’ attitudes, skills and use EBP found practitioners held generally supportive views of EBP but engaged in EBP activities (e.g. accessing and reading research, searching online research databases) infrequently [46].

Finally, qualitative studies have shown widespread negative attitudes towards research [47], and national NSLBP guidelines [48] amongst osteopaths in the UK. Osteopaths may believe that EBP adopts a reductionist method, which cannot fully capture their person-centred holistic approach [47]. Rejection of EBP also originates from a belief in the precedence of osteopathic philosophical principles over research and other healthcare modalities [48]. The aim of this study was to describe osteopaths’ perceptions of UK NICE NSLBP and sciatica guidelines in relation to their clinical practice, and the factors which influenced these perceptions.

2. Methods

The reporting of this study utilised the consolidated criteria for reporting qualitative research (COREQ) [49].

2.1. Study design

A qualitative research design was used, utilising constructivist grounded theory method (CGTM) as a framework for the study [50]. This enabled the researcher to explore participants' socially constructed perceptions of NICE NSLBP and sciatica guidelines in practice and what influences their use. A constructivist approach to grounded theory was chosen as it recognised that through interacting with participants during interviews and with data during analysis, the researcher co-constructed the different meanings and experiences of osteopaths' in utilising the guidelines. Specifically, osteopaths' perceptions of NICE NSLBP and sciatica guidelines and the social and cognitive contexts through which these perceptions took place was considered [50].

2.2. Recruitment and sampling

Participants within a 5-mile radius of the researchers’ Osteopathic Educational Institution (OEI) were recruited purposively via email from the General Osteopathic Council (GOsC) practice register. Purposive sampling ensured: 1) participants were qualified and registered osteopaths; 2) had clinical experience of treating and managing NSLBP and therefore met the informational needs of the study to provide diverse data for analysis [51]. After potential participants expressed an interest in participation, they received an information sheet with a formal invitation to take part. After having time to review the information, all participants provided informed consent to take part in an interview.

2.3. Participants

All participants were interviewed solely by the lead researcher (JI),

a male final year Osteopathy Master's degree student, who had studied qualitative research methods for the preceding three years. In some cases, the researcher was known by the participant prior to the study. Prior to commencing the interviews, participants were reminded that the research aimed to explore their perceptions of NICE NSLBP and sciatica guidelines and that all interviews were confidential.

2.4. Data collection

Data was collected through semi-structured interviews recorded using an audio recorder, with field notes made during and after interviews to identify areas for further clarification when necessary and to aid subsequent data analysis. All interviews occurred face-to-face at the lead researcher's OEI or at the participants' place of work. Semi-structured interviews enabled further questioning to clarify the individual's perceptions and opinions. Interviews began with open general questions, to establish rapport and encourage participants to feel comfortable expressing their ideas [52]. Open questions were used to explore beliefs, experiences and attitudes towards NICE NSLBP and sciatica guidelines. Verbal and body language prompts encouraged participants to express their ideas fully [53] (see Table 1).

Pilot interviews were conducted by the lead researcher with osteopathic colleagues to ensure clarity of the topic guide (shown in Table 2). Constant critical reflection upon the data collected and comparative analysis of categories constructed was used to refine and focus the interview guide so that areas which appeared important to addressing the research questions were explored in detail [41]. Interviews were then transcribed verbatim by the lead researcher on a laptop, with all electronic files held confidentially on an encrypted memory stick. The researcher adopted the concept of 'theoretical sufficiency' to guide data collection, and data was gathered until no new insights were generated from analysis conducted concurrently with data collection [54].

2.5. Data analysis

Analysis was conducted by the lead researcher utilising coding and constant comparative analysis within a framework of CGTM [50]. Anonymised textual data gathered from the interviews was read several times, coded, then compared and generated into categories around identified patterns with core similarities and differences, with memos written to further aid analytical thinking [55]. No code or categories were identified in advance. Data analysis occurred until no new insights or categories were obtained [54].

2.6. Coding

Coding and categorisation of the textual data collected from the interviews was analysed using the following process:

1 Initial coding examined transcripts line-by-line and took specific statements and phrases from the data [50]. These statements were grouped into codes, patterns in the data that shared similar features between one another.
2 Advanced focused coding was then used to categorise the initial codes of interest, to form 'categories' that captured distinct explanatory and conceptual patterns in the data central to the study's research question [55].
3 Codes that did not fit into the categories generated were recognised and used to help qualify the developing findings and enhance analysis [55].

Table 1
Initial interview guide.

1. Can you tell me about why you became an Osteopath?
2. What do you understand by the term 'guidelines' in healthcare?
3. How do you think guidelines integrate with the osteopathic approach?
4. How did you come to know of the guidelines?
5. How do the NICE low back pain guidelines influence your treatment or management, if at all?
6. What are your thoughts on the statement: 'The osteopathic philosophy is incompatible with guidelines'?
7. What are your thoughts on the statement: 'Guidelines integrate research with practice?
8. What are your thoughts on the statement: 'Guidelines enhance holistic practice'
9. After these questions, is there anything you would like to add?

Table 2
Example coding (underlined text relates to code generated).

Extract of transcribed interview	Example of line-by-line coding
We need to understand what the guidelines are for so we can provide that continuity of care. If we are looking at the person as a whole then we need to understand what is going on and where they should be on that journey, so I think that really made me think that actually this is really being osteopathic	Obligation Integrated care Person focus Holistic Patient context Osteopathic approach

2.7. Trustworthiness

Several strategies were used to evaluate and strengthen the trustworthiness of the study. To enhance the credibility of the research, reflexive and analytical memos were written throughout data collection to explicate the researchers' a-priori knowledge of the literature, bias and assumptions. By putting these into writing, the researcher aimed to test them out during data collection and analysis [55]. The lead researcher immersed themselves in the data by reading and re-reading transcripts, comparing developing codes and categories concurrently with data collection and used advanced coding to examine significant codes. Throughout data analysis, critical discussions also took place with the co-researcher (OT) regarding the lead researcher's interpretations [56]. Following the development of apparent key categories from advanced coding, interview questions were focused to explore topics and areas which the researchers felt were important to develop the findings further. To aid the co-construction of data, participants were invited to check and comment on their interview transcripts and the researcher's interpretation of them, to enhance the credibility of the findings [57].

3. Results

Seven participants (Table 3) agreed to participate and were interviewed over three months, with a range of clinical working contexts and years of clinical experience. No participants dropped out or refused to participate after expressing an interest to take part. Interviews lasted up to 60 min, and no repeat interviews were carried out.

Data analysis resulted in development of four categories to account for the factors influencing participants' perceptions of NICE NSLBP and sciatica guidelines. The categories are presented in the following section, with quotes to illustrate participants' views shown (see Table 4 for additional quotations from participants). The numbered square brackets denote the participant's quotes.

3.1. Categories

Four categories were generated from the data which described participants' perceptions of NICE NSLBP and sciatica guidelines. These were:

- Navigating Clinical Uncertainty

Table 3
Participant characteristics.

Participant (P)	Gender	Years Qualified	Working Environment(s)
1	M	5	Clinic tutor and multidisciplinary private clinic
2	M	6	Solo private practitioner
3	M	5	Clinic tutor and Lecturer
4	M	3	Lecturer, solo private practitioner (working with NHS referrals).
5	M	6	Solo private practitioner (previous NHS experience)
6	F	15	Solo private practitioner
7	F	20	Clinic tutor and solo private practitioner

M = Male, F = Female.

- Views of knowledge
- Clinical Decision-making
- Professional identity

3.1.1. Navigating clinical uncertainty

How participants navigated clinical uncertainty, defined in this case as the inherent uncertainty of the clinical environment and the multitude of factors that can influence a patients' NSLBP and sciatica, was deemed central to the range of views participants held in relation to the NICE NSLBP and sciatica guidelines. Participants who expressed negative perceptions of the guidelines appeared to navigate this uncertainty by emphasising the role of themself as a practitioner. They favoured the application of their specialist osteopathic knowledge to inform their decision-making; largely driven by a perceived distinct professional identity to guide their treatment of NSLBP and sciatica.

' … the body is so complex, I don't think you can ever really squeeze it into guidelines.' [P6]

' … within the guidelines, what it's talking about in terms of what you're treating, is very clearly the low back. As an osteopath that is wholly unosteopathic.' [P4]

Participants referenced a superiority of their osteopathic approach and their clinical experience to understand individual patients and navigate the uncertainty of the clinical environment, and saw NICE NSLBP and sciatica guidelines as a restriction on their unique practice. They viewed research and the guidelines as less or unable to account for the complexity of their approach, ascribing more weight to their personal clinical experience. Participants regarded their approach to diagnosis as able to better understand the causes of NSLBP and sciatica, in some cases criticising the categorisation of LBP as 'non-specific'.

'[nonspecific LBP] 'that's a diagnosis of exclusion. That's saying it's not this terrible condition.. I don't know what it is, but it's something else, you deal with it. So you know you're then starting from scratch osteopathically to work out well what is going on' [P4]

'I think the guidelines are based on evidence, and I think that they are therefore proven to be theoretically effective … I'm not sure if I completely agree with that because I think it's difficult with any medicine to work in a purely evidence-based practice theory. [P6]

Conversely, participants with more positive attitudes toward the guidelines appeared to acknowledge uncertainty within the clinical environment regarding NSLBP and sciatica. As there was greater reference to the patient regarding their application of NICE NSLBP and sciatica guidelines. These practitioners appeared to navigate the uncertainty of the clinical environment with more emphasis on the potential for them to benefit the patient. This was informed by a critical view of knowledge, flexible conception of professional identity and a greater reference to how the NICE NSLBP and sciatica guidelines could help patients with their decision-making.

'Nothing is black and white, it's grey, you know clinical uncertainty. But if you've got something that says, "right well back pain is going to take 6–8 weeks" it's a useful tool'. [P1]

NICE NSLBP and sciatica guidelines were described by some participants as a valuable tool to help navigate clinical decision-making with the patient; aid their holistic understanding and treatment of the patient; and were relevant to all health professionals treating NSLBP and sciatica. Specialist osteopathic knowledge and philosophical principles were viewed critically. Diagnosis of non-specific LBP was understood to reflect the inherent uncertainty identifying a causative structure for pain.

"I'm very comfortable with the term non-specific because I think it reflects a reality of uncertainty again. It provides a degree of certainty within that uncertainty.' [P3]

'I can talk very comfortably to a point around non specific back pain.. it may be that I am saying you know well we currently understand most back pain will last 6–8 weeks, it may not last that long but it gives me a time frame and it also in some respects frees me up to sort of try and move away from it being a tissue causing symptom' [P1]

3.1.2. Views of knowledge

Participants who placed greater emphasis on the practitioners' experience and educational principles to guide diagnosis and treatment, with less attention towards research, shared negative views of NICE NSLBP and sciatica guidelines. They appeared to adopt an uncritical stance towards their experiences and educational knowledge, viewing them as unchanging, while emphasising the limitations of research and its inability to capture the complexity of osteopathy and subsequent practice.

' … but I think with experience you become more confident with saying you know what I think this is the best course with this patient at this time, rather than needing to look through a manual.' [P4]

'I guess you would hope once you are sort of fully qualified and experienced you would be able to work it out for yourself. I mean that should be my feeling, personally I wouldn't take any notice of any the guidelines I would look at them from an interest point of view. I kinda feel I can work it out by now' [P5]

In contrast, participants with a more critical view of their knowledge shared an amenable perception towards NICE NSLBP and sciatica guidelines. They tended to adopt a critical view towards their own knowledge and experiential learning. They recognised the utility of research-based CPGs as an accessible synthesis of evidence for all clinicians operating in an environment of clinical uncertainty.

'It saves time and effort for me to go and look at all that evidence but also challenges my approach, that I'm not doing just what I want to do and believe it works.. rather than it being a mystical force what we do.' [P1]

3.1.3. Clinical decision-making

The guidelines were perceived by some participants as generic and a restriction on the ability for them to care for the patient. Practitioners described using their holistic approach in their clinical decisions, with

Table 4
Further illustrative quotes *[Participant ID]*.

Navigating Clinical Uncertainty
'I suppose that's what I mean by the grey area, the stuff that gets them [the patient] better that we cant really prove.. but it's hard you see, you can't measure everything' [P2]
'there is always grey areas with evidence based work, I don't think sometimes really truly understand the true physiology of certain techniques.' [P6]
'examinations have a large degree of uncertainty to them and therefore having protocols, guidelines, algorithms that try to allow us to provide that degree of certainty and quantity. There's a comfort there.' [P3]
'there is a 'grey area'.. why people get better when you do things that don't have any basis in scientific fact I guess is what I would say.' [P2]
'..there is always that grey area in practice where things can't be explained by science alone, maybe its the power of touch, the power of conversation.. You can't really quantify those things so there'll always be a grey area … We've all done a bit of cranial, and theres no evidence for that whatsoever.' [P2]
'Because the human body is so complex. and there is just no enough machines and gadgets that are as complex as the human body to ever truly be able to keep up with it.' [P6]
'I'm basically in favour of anything that works for a patient, because we aren't sure why stuff works' [P4]
Views of Knowledge
'After a certain level of experience or of practice you should have the experience to treat each individual case on its own merit.' [P5]
'I've done loads of cranial in the past.. but yeah there's absolutely no evidence it works whatsoever, but I've worked in a cranial practice where I've got people better.. and there is no evidence for it, that it works at all.' [P2]
'[the guidelines] help challenge my ways of working, that's based on the current research as much as it can be … it just saves time and effort for me to look at all that evidence but also challenges my approach that I'm not doing just what I want to do and believe it works.' [P1]
'Certainly some research thats come through has changed the way that I approach things' [P3]
'[guidelines] are also a very quick way of the practitioner getting good relatively up to date information to keep them safe and reasonable effective.' [P7]
'..it's questionable whether RCTs are the pinnacle of the pyramid, but I think it gives us.. consistency, which I think is important rather than us all going off in different directions saying we are doing the same thing with nothing to underpin it apart from our clinical experience' [P1]
'in my opinion there hasn't be any groundbreaking research when it comes to osteopathy that has changed how it has been taught or what it does over the years.' [P6]
Clinical Decision-Making
'..you can't even two people with the same problem, one person might be very sensitive to treatment compared to another, so I think you've got to be able to think on your feet and use your brain in those certain circumstances.' [P5]
'We need to understand what the guidelines are for so we can provide that continuity of care. If we are looking at the person as a whole then we need to understand what is going on and where they should be on that journey, so I think that actually this is really being osteopathic.' [P1]
'I might use non-specific low back pain and that means it depends how I think, you know for some patient the words disc can be quite frightening just on its own.. so I think some of these new terms can be quite useful.' [P2]
[the guidelines] help to provide information and clarity to patients when they are in a very vulnerable position. I can now tell patients what it probably isn't, which in itself is very reassuring and beneficial … information from the general population suggests it will get better within a certain timeframe, that's very reassuring for patients.' [P3].
'I think one of the important things is to give the patient the sense that they are in charge, or at least strongly contributing to the process. That it is no good to just come in and passively lie them on the plinth.. they have to do things actively to support this process.' [P7].
'I think the guidelines aid our understanding of the wider healthcare sector.. I think it helps you be more informed and understand what the patient's going through and obviously you can talk in a way that is helpful to the patient.. rather than being kind of out on the periphery' [P1]
Professional Identity
'They [the guidelines] are limiting. They tell you what you can treat and how you can treat it. That's prescriptive and osteopathic is not prescriptive.. Which is why it is so difficult to become an osteopath or work osteopathically.' [P4]
'I think Osteopathy and Osteopaths are unique but they can be grouped in with physiotherapists and with chiropractors, who don't have an osteopathic perspective because they are not trained to be osteopaths.' [P4]
'if you don't use evidence, then there is nothing scientific about it. And I think in that case you might just as well be a healer, which is fine. But I don't think it is Osteopathy.' [P7]
'there would be cases where you'd think this patient has not got a problem with their low back, the problem is coming from their knee. Therefore I can treat their low back the next year and it's not gonna get any better.. I think most times, the guidelines and osteopathic philosophy are incompatible.' [P4]
'Osteopathy has traditionally prided itself on being an individualised healthcare modality, so therefore there's a general … a kind of wariness of generalised information of a "one size fits all approach" to a patient because those patients aren't one size.' [P3]
'it's about everyone having a consistent pathway of care that comes interaction with a manual healthcare practitioners, which I would class myself as. Even though I work in the private sector.. I should be working to the same level of guidelines as a GP that works within the NHS.' [P1]
'If you've got a piece of evidence thats been done by a physiotherapist that is more prescriptive then thats not gonna be helpful because we don't look at things prescriptively. So that's not osteopathic.. there's like a juxtaposition if its come from a different philosophical approach' [P4]
'What attracts me about osteopathy is you are allowed to free think and its not sort or protocoled' [P5]

guidelines unable to account for the contextual factors of each individual patient and their osteopathic approach..

> *' … someone presents to you saying they've got low back pain, it doesn't mean they've got a problem with their low back. We would look at the whole body … ' [P4]*

> *' … you can't even two people with the same problem, one person might be very sensitive to treatment compared to another, so I think you've got to be able to think on your feet and use your brain in those certain circumstances.' [P5]*

In contrast, participants who viewed the NICE guidelines positively proposed they enhanced their holistic understanding of the patient and described the contribution of the guidelines to the patients understanding of NSLBP and sciatica and their decision-making. The guidelines were useful to consider their patient's care pathway in the National Health Service. Additionally, they were used as an aid to communicate advice and reassure patients with NSLBP, for example advice on unnecessary imaging.

> *'All those facts and figures than help reassure patients and that then informs my treatment, which will say actually there is no reason why this patient will not get better, I just need to try and communicate and reduce levels of fear by labelling it with a condition or labelling it with potentially by sending them off for imaging' [P1]*

> *'I think it can also be very useful in private practice to refer to the guidelines with the patient, so that as you are going through various tests and procedures you can tell them that this isn't the case with them, particularly with red flags, neurological problems. You can explain why you are doing the tests, so we have done this and done this, and you don't have this, so this is good news. And that can put their mind at rest' [P7]*

3.1.4. Professional identity

Participants with a negative view of NICE NSLBP and sciatica guidelines had a strong sense of their professional identity. They believed the osteopathic approach to be unique and complex, in need of isolation from other manual therapies and 'orthodox' approaches such as medicine and physiotherapy, so the guidelines were regarded as a rigid framework unable to capture the unique osteopathic philosophy in most cases.

> *' … the wider concept of osteopathy philosophy, depending on what context you take it in, is not hugely compatible with guidelines. Looking back at the Still philosophy it is founded on, that doesn't fit into any guideline.' [P6]*

> *'We are a distinct profession rather than being lumped in with manual therapists, because we are different and we as a profession need to maintain that otherwise that's the end …. Yeah well, it's a slippery slope. I think we very easily and quickly could lose our identity.' [P3]*

In contrast, participants with a more flexible perception of their professional identity demonstrated more positive views of NICE NSLBP

and sciatica guidelines. Their osteopathic approach was viewed within the broader concept of manual therapy and allied medical practice. The guidelines complemented their healthcare approach and were deemed a flexible tool to aid them to manage clinical uncertainty. Such participants often expressed concern of being sidelined if they did not stay up to date using research.

> *'I think it [guidelines] aids our ability to be holistic patient-centred practitioners … Call it osteopathy if you like … patients are at the centre of everything.' [P1]*

> *'if you don't use evidence, then there is nothing scientific about it. And I think in that case you might just as well be a healer, which is fine. But I don't think it is Osteopathy.' [P7]*

4. Discussion

The aim of this study was to gain further understanding of the perceptions of osteopaths' perceptions of NICE NSLBP and sciatica guidelines and the factors influencing these perceptions. The findings suggest that osteopaths' perceptions may be influenced by how they view and navigate uncertainty of the clinical environment and how they conceptualise their professional identity, clinical decision-making and their views of knowledge.

Some of the factors identified in this sample of osteopaths may act as obstacles to usage of CPGs and is consistent with previous research [47,48]. Firstly, the findings of this present study that osteopaths with a belief in the superiority of their professional identity is supported by Figg-Latham and Rajendran's qualitative study [48]; that described the attitudes of osteopaths towards CPGs. These researchers' findings described a core theme they termed 'Precedence of Osteopathy' (PoO), which offered osteopaths a 'cognitive lens' to invert the levels of the evidence pyramid, where their personal opinion, experience and philosophical principles had greater clinical value to inform their practice than research-based CPGs [48].

Moreover, rejection of CPGs based on a belief in the complexity and superiority of osteopathic philosophical knowledge is consistent with findings from current research of osteopaths. Osteopaths maybelieve that their traditional theories and principles, which they deem to be unique, enable a deeper understanding of their patients, which as a result precludes them from adopting evidence-based healthcare and CPGs [35,48]. In contrast, practitioners describing more critical approaches to knowledge [58,59], are more accepting of CPG recommendations.

Negative views of CPGs, based on a preference for personal knowledge and experience to inform clinical decision-making, as suggested by some participants in this study, have also been identified in physiotherapists and General Practitioners [16,17,19,22,60,61] suggesting this belief is a shared obstacle across healthcare professions. However, the crossover of findings from other healthcare disciplines into research examining osteopaths is potentially limited by the philosophy and osteopathic principles that influence clinical reasoning [35,36,38]. Grace et al., [62] identified unique contextual factors in different healthcare professions that affect osteopaths' intention to apply CPGs and these beliefs of superiority of the osteopathic philosophy may be implicated in the rejection of NICE NSLBP and sciatica guidelines by some osteopaths.

Whilst CPG adherence is associated with better clinical outcomes [13,14] it can also be linked with lower patient satisfaction [63]. Patient expectations for NSLBP treatment could be a factor in dissatisfaction, which can include receiving a specific diagnosis [64,65]. This supports the view of osteopaths who have negative perceptions regarding the use of 'non-specific' terminology in previous NICE guidelines. By placing importance on providing a biomedical diagnosis, they meet patient expectations attributing the patient's symptoms to a specific anatomical structure.

The categories of clinical decision-making and views of knowledge suggested here are consistent with research examining therapeutic approaches in osteopathy [36]. Participants with a negative perception of the guidelines had a greater focus on the practitioner's role, referencing their superior osteopathic clinical skills and experience to make decisions to navigate the uncertainty of clinical environments [36]. It could be hypothesised that the focus on practitioner-led decision-making may influence negative attitudes towards NICE NSLBP and sciatica guidelines as they challenge the autonomy and authority of the clinician [25].

Participants in this study who emphasised the influence of osteopathic philosophy informing their view of practice knowledge had a conception of practice considered to be 'technical rationality'. With this conception, practice knowledge was underpinned by a positivist epistemology that engendered a strong belief in the precedence and application of theoretical principles and rules, and as a result, knowledge gained from educational experience is perceived to be factual and unchanging [38]. The nature of evidence-based practice, and hence CPGs is that practice is obliged to change in response to the emergence of new evidence. As a result, tensions may develop when practitioners wish to preserve traditional knowledge, beliefs and reasoning. This may account for some participants questioning the relevance of CPGs to their practice, thereby acting as a obstacle to their use.

This study describes attitudes that facilitate NICE NSLBP and sciatica guideline use. Firstly, practitioners with a patient-centered approach to clinical decision-making, acknowledged the potential for the guidelines to help patients understand the prognosis and treatment recommendations for NSLBP and sciatica, and viewed the guidelines more positively. This is consistent with osteopathic therapeutic approaches emphasising patient autonomy, where practitioners aim to promote patient led decision-making, by facilitating the patient's understanding of their symptoms so they can make informed decisions whilst collaborating with the practitioner [36]. Further, osteopaths in this study discussed the use of 'non-specific' terminology to reflect the uncertainty associated with identifying a causative anatomical structure whilst also acknowledging the relevance of patients' psychosocial factors associated with NSLBP and sciatica. Appreciation of psychological and social factors influencing NSLBP is consistent with the recommendations in the NICE NSLBP and sciatica guidelines for use of the Keele STarT back screening tool, a prognostic questionnaire that facilitates identification of modifiable risk factors for back pain disability [5]. This may provide further evidence that osteopaths with a biomedical treatment orientation, who seek to manage psychosocial risk factors, find the NSLBP and sciatica guidelines useful for decision-making [66].

Furthermore, practitioners in this study which held a conception of practice akin to 'professional artistry', tended to acknowledge and embrace clinical uncertainty and is congruent with research-based theories of osteopathic clinical practice [38]. These practitioners displayed a more flexible understanding of practice, with an emphasis on NICE guidelines to help inform clinical decision-making, whilst also helping them to become aware of the limitations of relying on their previous clinical experience and alerting them to potential problems of bias in their practice. This may foster amenable attitudes towards CPGs as they are a tool to help navigate the uncertainty of the clinical environment, and account for less emphasis being placed on philosophical principles. Previous surveys have shown that physiotherapists can hold positive attitudes towards EBP and consider it important due to the potential for it to improve clinical decision-making [23,45]. This may further support the findings in this study as participants with positive attitudes towards NICE NSLBP and sciatica guidelines perceived them as improving decision-making and as a tool for accessing research evidence for clinical practice.

Another facilitator for use of NICE NSLBP and sciatica guidelines described by participants was the practitioners' obligations to their professional governing body and to the patient. The GOsC Osteopathic

Practice Standards (OPS) document outlines in the requirements of the practitioner, for example to keep professional knowledge and skills up to date, but also the duty to patients by working in partnership to find the best treatment for them [67]. This may be informed by the belief that the OPS represent the requirements for good osteopathic practice [68].

Clinical experience may be a factor affecting HCPs attitudes towards NSLBP treatment [69,70] and CPG use [24]. Although this research was a qualitative study with a small sample size, from the data generated it may be hypothesised that clinical experience may not be clearly related to practitioners' views of NICE NSLBP and sciatica guidelines. The influences of clinical experience and education on osteopaths' perceptions of NICE NSLBP and sciatica guidelines requires further exploration through larger quantitative survey study designs.

4.1. Implications

The implications of this study, particularly osteopaths' beliefs underlying negative attitudes towards NSLBP and sciatica guidelines, support previous findings within the literature of barriers to CPG usage [48]. With a greater understanding of osteopaths' attitudes facilitating use of LBP guidelines, educational institutions and regulatory bodies could more accurately target interventions to improve the use of CPGs in practice, which is currently inconsistent [43]. The divergence of views regarding NSLBP and sciatica guidelines further highlight the contrast between practitioners who view osteopathy as a distinct philosophical approach and those who predominately see it as a collection of manual therapy and healthcare with a looser philosophical grounding [35,37].

Further research examining how CPGs and EBP are promoted in clinical education would aid the understanding of the potential influence of educational factors to attitudes towards CPGs. Masters level degree programs can encourage more critical approaches to practice knowledge and greater patient-centred practice in physiotherapists and osteopathic educators have been shown to potentially influence their students' conception of practice [42,59], and may enhance the take-up of CPGs in clinical practice.

4.2. Strengths and limitations

The sampling of osteopaths working in clinical education, solo practice and within multidisciplinary clinics aimed to enhance the transferability of the study's findings to the different aspects of the osteopathic professional practice. However, given the diversity regarding osteopaths' conception of practice and different working environments, a wider sample may have enabled a richer exploration of the data to strengthen and understand what influences perceptions of NICE NSLBP and sciatica guidelines. As all participants graduated from the same OEI and not all working environments were represented, such as those within the public health (NHS) sector, the transferability of the findings may be limited given the potential influence these have on practice behaviour [48]. Although best efforts were made to ensure a breadth to the sample, there is a potential risk of bias as participants were recruited purposively within close proximity to a single OEI. Furthermore, the study produced conflicting attitudes towards use of NICE NSLBP and sciatica guidelines which could require further exploration.

5. Conclusion

In this study, osteopaths described a range of perceptions of NICE NSLBP and sciatica guidelines.

The barriers found to NICE NSLBP and sciatica guideline use in this research reflects similar findings from previous studies examining both osteopaths and other HCPs. UK osteopaths' attitudes towards evidence-based guidelines may be influenced by their professional identity and the source of their professional practice knowledge which they value (such as knowledge from osteopathic philosophical principles or knowledge from research). Therefore, facilitating the development of a professional identity which can consolidate the philosophy with EBP during education may engender more positive attitudes towards NICE NSLBP and sciatica guidelines.

Ethical approval

This study was approved by the University College of Osteopathy Research Ethics Committee (UCO REC).

Conflicts of interest

OT is on the Editorial Board for IJOM but was not involved in any peer-review or editorial decisions in relation to this paper.

References

[1] Lohr KN, Field MJ. Clinical practice guidelines: directions for a new program. National Academies Press; 1990.
[2] Guyatt G, Cairns J, Churchill D, Cook D, Haynes B, Hirsh J, Irvine J, Levine M, Levine M, Nishikawa J, Sackett D. Evidence-based medicine: a new approach to teaching the practice of medicine. JAMA 1992;268(17):2420–5.
[3] Sackett DL. Evidence-based medicine: how to practice and teach EBM. Churchill Livingstone; 2000.
[4] National Institute for Health and Care Excellence. NICE charter. 2017.
[5] National Institute for Health and Care Excellence. Low back pain and sciatica in over 16s: assessment and management. National Institute for Health and Care Excellence; 2016. (NICE guideline NG59). Full guideline. 2016.
[6] Balagué F, Mannion AF, Pellisé F, Cedraschi C. Non-specific low back pain. Lancet 2012;379(9814):482–91.
[7] Dagenais S, Caro J, Haldeman S. A systematic review of low back pain cost of illness studies in the United States and internationally. Spine J 2008;8(1):8–20.
[8] Hoy D, March L, Brooks P, Blyth F, Woolf A, Bain C, Williams G, Smith E, Vos T, Barendregt J. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. Ann Rheum Dis 2014:204428.
[9] Maniadakis N, Gray A. The economic burden of back pain in the UK. Pain 2000;84(1):95–103.
[10] Manchikanti L, Singh V, Falco FJE, Benyamin RM, Hirsch JA. Epidemiology of low back pain in adults. Neuromodulation 2014;17:3–10.
[11] Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M. 'Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study' 2010. Lancet 2012;380(9859):2163–96.
[12] Fawkes C, Leach J, Mathias S, Moore A. Profiling osteopathic practice in the UK using standardised data collection. Int J Osteopath Med 2013;16(1):e10.
[13] Fritz JM, Cleland JA, Brennan GP. Does adherence to the guideline recommendation for active treatments improve the quality of care for patients with acute low back pain delivered by physical therapists? Med Care 2007;45(10):973–80.
[14] Hanney WJ, Masaracchio M, Liu X, Kolber MJ. The influence of physical therapy guideline adherence on healthcare utilization and costs among patients with low back pain: a systematic review of the literature. PLoS One 2016;11(6). e0156799.
[15] Rutten GM, Degen S, Hendriks EJ, Braspenning JC, Harting J, Oostendorp RA. Adherence to clinical practice guidelines for low back pain in physical therapy: do patients benefit? Phys Ther 2016;90(8):1111–22.
[16] Parr S, May S. Do musculoskeletal physiotherapists believe the NICE guidelines for the management of non-specific LBP are practical and relevant to their practice? A cross sectional survey. Physiotherapy 2014;100(3):235–41.
[17] Poitras S, Durand M-J, Côté A-M, Tousignant M. Guidelines on low back pain disability: interprofessional comparison of use between general practitioners, occupational therapists, and physiotherapists. Spine 2012;37(14):1252–9.
[18] Suman A, Schaafsma FG, Buchbinder R, van Tulder MW, Anema JR. Implementation of a multidisciplinary guideline for low back pain: process-evaluation among health care professionals. J Occup Rehabil 2017;27(3):422–33.
[19] Bishop FL, Dima AL, Ngui J, Little P, Moss-Morris R, Foster NE, Lewith GT. "Lovely pie in the sky plans": a qualitative study of clinicians' perspectives on guidelines for managing low back pain in primary care in England. Spine 2015;40(23):1842–50.
[20] Breen A, Austin H, Campion-Smith C, Carr E, Mann E. "You feel so hopeless": a qualitative study of GP management of acute back pain. Eur J Pain 2007;11(1). 21-21.
[21] Côté A-M, Durand M-J, Tousignant M, Poitras S. Physiotherapists and use of low back pain guidelines: a qualitative study of the barriers and facilitators. J Occup Rehabil 2009;19(1):94.
[22] Dahan R, Borkan J, Brown JB, Reis S, Hermoni D, Harris S. The challenge of using the low back pain guidelines: a qualitative research. J Eval Clin Pract 2007;13(4):616–20.
[23] Scurlock-Evans L, Upton P, Upton D. Physiotherapy 2014;100:208–19.
[24] Mercuri M, Sherbino J, Sedran RJ, Frank JR, Gafni A, Norman G. When guidelines don't guide: the effect of patient context on management decisions based on clinical practice guidelines. Acad Med 2015;90(2):191–6.

[25] Wilson N, Pope C, Roberts L, Crouch R. Governing healthcare: finding meaning in a clinical practice guideline for the management of non-specific low back pain. Soc Sci Med 2014;102:138–45.
[26] Tonelli MR. Integrating evidence into clinical practice: an alternative to evidence-based approaches. J Eval Clin Pract 2006;12(3):248–56.
[27] Greenhalgh T, Howick J, Maskrey N. Evidence based medicine: a movement in crisis? BMJ 2014;348.
[28] Bernhardsson S, Johansson K, Nilsen P, Öberg B, Larsson ME. Determinants of guideline use in primary care physical therapy: a cross-sectional survey of attitudes, knowledge, and behavior. Phys Ther 2014;94(3):343–54.
[29] Layne EI, Roffey DM, Coyle MJ, Phan P, Kingwell SP, Wai EK. Activities performed, and treatments conducted before consultation with a spine surgeon: are patients and clinicians following evidence-based clinical practice guidelines? Spine J 2017;18(4):614–9.
[30] Prior M, Guerin M, Grimmer-Somers K. The effectiveness of clinical guideline implementation strategies–a synthesis of systematic review findings. J Eval Clin Pract 2008;14(5):888–97.
[31] Mesner SA, Foster NE, French SD. Implementation interventions to improve the management of non-specific low back pain: a systematic review. BMC Muscoskelet Disord 2016;17(1):258.
[32] Suman A, Dikkers MF, Schaafsma FG, van Tulder MW, Anema JR. Effectiveness of multifaceted implementation strategies for the implementation of back and neck pain guidelines in health care: a systematic review. Implement Sci 2015;11(1):126.
[33] Darlow B, Fullen BM, Dean S, Hurley DA, Baxter GD, Dowell A. The association between health care professional attitudes and beliefs and the attitudes and beliefs, clinical management, and outcomes of patients with low back pain: a systematic review. Eur J Pain 2012;16(1):3–17.
[34] Fullen BM, Maher T, Bury G, Tynan A, Daly LE, Hurley DA. Adherence of Irish general practitioners to European guidelines for acute low back pain: a prospective pilot study. Eur J Pain 2007;11(6):614–23.
[35] Kasiri-Martino H, Bright P. Osteopathic educators' attitudes towards osteopathic principles and their application in clinical practice: a qualitative inquiry. Man Ther 2016;21:233–40.
[36] Thomson OP, Petty NJ, Moore AP. Clinical decision-making and therapeutic approaches in osteopathy–a qualitative grounded theory study. Man Ther 2014;19(1):44–51.
[37] Thomson OP, Petty NJ, Moore AP. Osteopaths' professional views, identities and conceptions – a qualitative grounded theory study. Int J Osteopath Med 2014;17(3):146–59.
[38] Thomson OP, Petty NJ, Moore AP. A qualitative grounded theory study of the conceptions of clinical practice in osteopathy–a continuum from technical rationality to professional artistry. Man Ther 2014;19(1):37–43.
[39] Schein EH. Career dynamics: matching individual and organisational needs vol. 6834. Addison Wesley Publishing Company; 1978.
[40] Cotton A. Osteopathic principles in the modern world. Int J Osteopath Med 2013;16(1):17–24.
[41] Thomson OP, Petty NJ, Scholes J. Grounding osteopathic research – introducing grounded theory. Int J Osteopath Med 2014;17(3):167–86.
[42] Clarkson HJ, Thomson OP. 'Sometimes I don't feel like an osteopath at all'-a qualitative study of final year osteopathy students' professional identities. Int J Osteopath Med 2017;26:18–27.
[43] Weber V, Rajendran D. UK trained osteopaths' relationships to evidence-based practice - an analysis of influencing factors. Int J Osteopath Med 2018;29:15–25.
[44] Iles R, Davidson M. Evidence based practice: a survey of physiotherapists' current practice. Physiother Res Int 2006;11:93–103.
[45] Nilsagård Y, Lohse G. Evidence-based physiotherapy: a survey of knowledge, behaviour, attitudes and prerequisites. Adv Physiother 2006;12:179–86.
[46] Sundberg T, Leach MJ, Thomson OP, Austin P, Fryer G, Adams J. Attitudes, skills and use of evidence-based practice among UK osteopaths: a national cross-sectional survey. BMC Muscoskelet Disord 2018;19(1):439.
[47] Humpage C. Opinions on research and evidence-based medicine within the UK osteopathic profession: a thematic analysis of public documents 2003–2009. Int J Osteopath Med 2011;14(2):48–56.
[48] Figg-Latham J, Rajendran D. Quiet dissent: the attitudes, beliefs and behaviours of UK osteopaths who reject low back pain guidance – a qualitative study. Musculoskel Sci Pract 2017;27:97–105.
[49] Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care 2007;19(6):349–57.
[50] Charmaz K. Constructing grounded theory. SAGE Publications; 2014.
[51] Morse JM. Strategies for sampling. Qualitative nursing research: a contemporary dialogue. 1991. p. 127–45.
[52] Mills J, Bonner A, Francis K. Adopting a constructivist approach to grounded theory: implications for research design. Int J Nurs Pract 2006;12(1):8–13.
[53] Kvale S. Doing interviews. SAGE Publications; 2008.
[54] Dey I. Grounding grounded theory: guidelines for qualitative inquiry. Academic Press; 1999.
[55] Birks M, Mills J. Grounded theory: a practical guide. Sage; 2015.
[56] Holloway I, Wheeler S. Qualitative research in nursing and healthcare. Wiley; 2013.
[57] Morse JM, Barrett M, Mayan M, Olson K, Spiers J. Verification strategies for establishing reliability and validity in qualitative research. Int J Qual Methods 2002;1(2):13–22.
[58] Petty NJ, Scholes J, Ellis L. The impact of a musculoskeletal master's course: developing clinical expertise. Man Ther 2011;16(6):590–5.
[59] Petty NJ, Scholes J, Ellis L. Master's level study: learning transitions towards clinical expertise in physiotherapy. Physiotherapy 2011;97(3):218–25.
[60] Cabana MD, Rand CS, Powe NR, Wu AW, Wilson MH, Abboud P-AC, Rubin HR. Why don't physicians follow clinical practice guidelines? A framework for improvement. JAMA 1999;282(15):1458–65.
[61] Farquhar CM, Kofa EW, Slutsky JR. Clinicians' attitudes to clinical practice guidelines: a systematic review. Med J Aust 2002;177(9):502–6.
[62] Grace S, Orrock P, Vaughan B, Blaich R, Coutts R. Understanding clinical reasoning in osteopathy: a qualitative research approach. Chiropr Man Ther 2016;24(1):6.
[63] Jensen CE, Jensen MB, Riis A, Petersen KD. Systematic review of the cost-effectiveness of implementing guidelines on low back pain management in primary care: is transferability to other countries possible? BMJ Open 2016;6(6). e011042.
[64] Hopayian K, Notley C. A systematic review of low back pain and sciatica patients' expectations and experiences of health care. Spine J 2014;14(8):1769–80.
[65] Verbeek J, Sengers M-J, Riemens L, Haafkens J. Patient expectations of treatment for back pain: a systematic review of qualitative and quantitative studies. Spine 2004;29(20):2309–18.
[66] Hendrick P, Mani R, Bishop A, Milosavljevic S, Schneiders AG. Therapist knowledge, adherence and use of low back pain guidelines to inform clinical decisions–A national survey of manipulative and sports physiotherapists in New Zealand. Man Ther 2013;18(2):136–42.
[67] GOsC. General osteopathic Council. Osteopathic practice standards. 2012.
[68] McGivern G, Fischer MD, Palaima T, Spendlove Z, Thomson O, Waring J. Exploring and explaining the dynamics of osteopathic regulation, professionalism and compliance with standards in practice. General Osteopathic Council; 2015.
[69] Carlsen B, Glenton C, Pope C. Thou shalt versus thou shalt not: a meta-synthesis of GPs' attitudes to clinical practice guidelines. Br J Gen Pract 2007:971–8. December.
[70] Pincus T, Foster NE, Vogel S, Santos R, Breen A, Underwood M. Attitudes to back pain amongst musculoskeletal practitioners: a comparison of professional groups and practice settings using the ABS-mp. Man. Ther. 2007;12(2):167–75.