
Declaration

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This research project entitled "**Attitudes and beliefs of New Zealand osteopaths towards chronic pain**" is submitted in partial fulfillment for the requirements for the Unitec degree of Master of osteopathy.

CANDIDATE'S DECLARATION

I confirm that:

This Research Project represents my own work;

- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

Research Ethics Committee Approval Number: 2008.683

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Attitudes and beliefs of New Zealand osteopaths towards chronic pain

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A research project submitted in partial requirement for the degree of Master
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Overview

The following research project is divided into three sections.

The first section comprises a three-part review of the literature regarding chronic pain; particularly highlighting the attitudes of health professionals toward this complex experience. The first part is centred initially on the evolution of pain medicine theories regarding the production and maintenance of chronic pain. This is followed by assessment and treatment procedures for chronic pain, used by various treatment providers, including osteopaths. The second part examines patient attitudes and beliefs surrounding their experience with chronic pain. The behaviours that form the basis of disability are highlighted, as are factors that contribute to the modification of chronic pain attitudes. Finally, the third part explores the attitudes of health professionals, drawing attention to the beliefs around disability as well as certain aspects that affect their attitudes towards chronic pain. Osteopathic literature in this field is minimal.

The second section is structured in the manuscript format for submission to the *International Journal of Osteopathic Medicine*. This section details the use of two previously formulated surveys that investigated the attitudes and beliefs of New Zealand osteopathic practitioners and students. These surveys were distributed via email and by postal delivery. Preliminary results are detailed.

The third section contains appendices that include the two questionnaires, ethics approval, figures and tables.

1. Section 1: Literature Review

1.1. *Introduction*

Chronic pain is a growing condition within western society, with an economic impact growing exponentially with time (Maniadakis & Gray, 2000), despite the progress seen in pain medicine over the last 50 years (DeLeo, 2006; Melzack, 2005). Although chronic pain is by no means a new condition, what is becoming more prominent is the degree of disability associated with persistent pain (Riley, Ahern & Follick, 1988). Pain evolutionists have proposed that the failure in addressing the problems with chronic pain lie in a lack of thorough patient assessment (Gonzalez, Martelli & Baker, 2000; Brown & Richardson, 2006), with Melzack and Wall strongly emphasising the importance of psychology in the production and maintenance of one's pain (Melzack & Wall, 1965; Melzack, 2005). These findings have led to an investigation into the origins of the psychological maintainers of chronic pain and the influence of patients' attitudes on the outcome on their pain experiences (Geisser & Roth, 1998). Factors contributing to patient attitudes include gender (Unruh, Richie & Merskey, 1999), spirituality (Wachholtz, Pearce & Koenig, 2007), education and knowledge of their pain (Geisser & Roth, 1998).

A treatment interaction is a dualistic phenomenon, so it is of further interest to explore the practitioners' contribution to the pain experience. This is an under-researched area of medicine and could hold the key to the successful treatment of chronic pain.

Research indicates that practitioners believe in the psychological contribution to pain (Smart & Doody, 2007) and recognise the disability that occurs with its persistence. Some argue that practitioners' fear-related attitudes to pain contribute to patients' disability (Sullivan, Bishop & Pivik, 1995). Other factors that appear to contribute to practitioners' attitudes towards chronic pain include education (Latimer, Maher & Refshauge, 2004), clinical experience (Rainville, Bagnall & Phalen, 1995), practice knowledge (Cherkin, McCornack & Berg, 1988) and culture (Chiu, Trinka, Lim & Tuazon, 2003). It has also been proposed that successful treatment of chronic pain is dependent on a merging of both practitioner and patient belief systems (Brown & Richardson, 2006).

Osteopaths are routinely treating chronic pain, however, little research is available that investigates their practice. At this time, there appears to be no research regarding the attitudes and beliefs of osteopathic practitioners or patients regarding chronic pain. Although there is currently little research investigating osteopathy and chronic pain, the principles and practice of osteopathy appear appropriate for the successful treatment of chronic pain with its thorough assessment, individualised treatment and care.

1.2. *Chronic Pain*

Pain is probably the most physically and psychologically significant sensory experience an individual encounters Furthermore, pain has an important evolutionary or protective function, warning the body that damage may be occurring. (Butler & Moseley, 2003; Turk & Melzack, 2001). The International Association for the Study of Pain (IASP) defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (Merskey & Bogduk, 1994; The International Association for the Study of Pain, 2009). Chronic pain was earlier defined by a time contingent approach as: pain persisting longer than 3-6 months (Rozenberg, 2008). However, the IASP has highlighted that chronic pain can be defined by both physical and psychological characteristics, which can be present much earlier (Task Force on Taxonomy, 1994). No data is available on the economic impact of the collective ‘chronic non-malignant musculoskeletal back pain’ in New Zealand but there is concern that the financial burden is increasing. Turk and Monarch (2002) have suggested that the escalation in demand for healthcare is as a consequence of western medicines failure to adequately understand and respond to the complex, multidimensional nature of chronic pain.

1.2.1. Evolution of pain theories

Our understanding of pain and the mechanisms by which pain is perceived has evolved substantially in the last four centuries. Early theories described by Rene Descartes in 1644 detailed a simplistic cause-and-effect relationship, whereby the perception of pain by the brain was a direct result of peripheral tissue injury (Helms & Barone, 2008). Subsequently in the 19th century, Von Frey built on Descartes' ideas when he formed the specificity theory. The specificity theory highlights the importance of specialised pain receptors in the periphery and their transmission of information to a pain centre in the brain (Helms & Barone, 2008). However, these two hypotheses were comparatively simplistic due to the anatomical and physiological knowledge at the time. A major evolutionary step was pioneered by Melzack and Wall in 1965 that recognised the brain as a source and contributor to the pain process. This theory was known as the Gate Control theory (Melzack & Wall, 1965).

The essential feature of the Gate Control theory is that pain is not just a local phenomenon but is centrally controlled. Melzack and Wall used the analogy of a gate to describe the way in which higher brain centres are able to modulate one's perception of pain (Helms & Barone, 2008; Melzack, 1999). Thus an 'open' gate allows nerve impulses from the periphery through to the pain centres in the brain and pain is perceived, while a 'closed' gate reduces the perception of pain (Helms & Barone, 2008; Melzack, 1999). The Gate Control theory also emphasises the importance of spinal plasticity and sensitisation of the central nervous system in the mechanisms of chronic pain (DeLeo, 2006; Helms & Barone, 2008; Siddall & Cousins, 1997b). Neuronal plasticity is the ability of a tissue to adapt its response to an input. One form of neuronal plasticity is spinal sensitisation. This is a heightened response to an input (Baranauskas & Nistri, 1998).

While Melzack and Wall's pain theory is regarded as a major evolutionary step in our understanding of pain, some of the assumptions their research is based on have been questioned (DeLeo, 2006). DeLeo has criticised the theory and its unanswered questions relating to previous pain experiences, stress effects and chronic pain issues.

Despite its criticisms, the theory has its supporters, and is still well utilised by health care practitioners (Dickenson, 2002).

Recently, Melzack and Wall, building on their original hypothesis, presented the ‘neuromatrix of pain’ theory, which suggests that each person’s network of neurons is genetically built in the ‘body-self neuromatrix’ (DeLeo, 2006; Melzack, 2005; Moseley, 2003). The body-self neuromatrix is a widespread network of neurons which consists of intimate loops between the thalamus, cortex and limbic system and can be sculpted by all facets of a person’s physical, psychological and cognitive make-up, including their life experiences (Melzack, 2005). The theory further suggests that body sensations are subserved by the same neural processes in the brain and that these processes can not only modulate inputs, but can also act in the absence of any sensory inputs (Melzack, 2005). This hypothesis can explain those pain states where peripheral damage is not always evident, such as phantom limb pain and fibromyalgia (Melzack, 1999, 2005).

At a similar time, Melzack and Wall developed their central neuromatrix theory. Advances were made in neurochemistry that enabled researchers to examine more specifically local pain mechanisms. Most notably, Siddall and Cousins (1997a) detail how inflammatory mediators such as substance p and neurokinins have the ability to reduce the threshold of activation of a nociceptive impulse, sensitising the tissue. With progression of these theories, a new vocabulary has developed to describe and communicate these pain states. It is now common language for therapists to use terms such as allodynia¹ and hyperalgesia² to describe patient presentation (Siddal & Cousins, 1997a).

The complexity of these theories and individuality of pain processes may explain the poor relationship between pain and dysfunction and thus the difficulties in treating it. Due to the multi-factorial contributions to the total pain experience, it appears logical that both assessment and approaches to chronic pain should be multidisciplinary.

¹ Allodynia: Pain due to a stimulus which normally does not provoke pain

² Hyperalgesia: An increased response to a stimulus which is normally painful

1.2.2. Pain assessment

The most common reason that patients present to healthcare professionals is pain (Schnall, 2003). A health professional's ability to interpret and assess pain is pivotal to healthcare practice. It is this assessment that justifies their management of the patient, either by treatment or referral and, therefore, accurate assessment and interpretation, particularly in chronic pain patients is important. As a result, a number of different pain assessment tools have been developed and used, but none have provided a completely satisfactory tool to assess chronic pain patients.

Traditionally, doctors interpreted pain and dysfunction based on the patient's self report. Recently, it has been common to use pain scales such as the visual analogue scale (VAS) to interpret pain. However, in a literature review conducted by Schnall (2003), assessment of the more involved processes of chronic pain require a much deeper analysis, as the relationship between tissue damage and pain intensity is less proportional. Furthermore, Schnall (2003) suggests that rather than focusing on pain intensity alone, more attention should be dedicated to assessing the psychological impact of chronic pain, as well as objective measures such as blood tests. Consistent with this approach, Gonzales, Martelli and Baker (2000) suggest that the complex nature of chronic pain and its central nervous system modulation requires a thorough assessment and treatment of all facets of a patient's life. Not only is this an ethical approach to patients, in terms of providing the best care, but it also appears to satisfy patients' need for reassurance for their condition (Parsons et al., 2007). The importance of patient satisfaction related to trust and the subsequent treatment success will be discussed in detail later in the review.

1.2.3.Approaches to chronic pain

In light of the complex nature of chronic pain, research has shown that treatment approaches designed to address the entire pain experience are more likely to result in positive treatment outcomes (Arnold, Bradley, Clauw, Glass, & Goldenberg, 2008; Brown & Richardson, 2006; Hardy, 2005; Passik & Weinreb, 2000). This may

indicate that the global view of pain management is changing, and it could be argued that the change in management of chronic pain has coincided with an increase in the use of complementary healthcare (Haetzman, Elliott, Smith, Hannaford, & Chambers, 2003). Reasons for this shift in healthcare have not been well established but it may be due to dissatisfaction with mainstream medicine. Orthodox medicine is known to rely predominantly on pharmaceutical pain relief and although pain relief can be effective (Brody, 2001), it is argued that this modality does not address other factors such as coping skills and belief systems (Gonzales et al., 2000). It is becoming more common to utilise collectives such as multidisciplinary health teams in order to address all physical, emotional and psychological components of a patient living with chronic pain (Brown & Richardson, 2006).

1.2.3.1. Osteopathic approach to chronic pain

Given that chronic pain is a more complex phenomena than was once acknowledged, a more comprehensive biopsychosocial treatment approach is required that attempts to address both the tissue causing symptoms as well as some of the more complex psychological changes which occur. Osteopathy has been described as a holistic healthcare modality which attempts to assess and treat individuals with consideration of the mind, body and soul connections. Thus while osteopaths are not trained psychologists, osteopathic philosophy has a long history of attempting to diagnose and treat the “whole person” and thus may be well suited to treating chronic pain patients. These findings have been supported by osteopathic literature that suggests the importance of the psychological contribution to pain, and that practitioners should aim to address these issues for optimum treatment outcomes (Kuchera, 2005; Parsons & Marcer, 2006).

The contribution that osteopaths may have to treating chronic pain patients could also be enhanced by their hands-on approach to patient management. Osteopaths use touch to greet, diagnose and treat their patients. While a comprehensive discussion of touch is outside the scope of this review, it is worth discussing briefly the impact of touch on the practitioner-patient interaction and how this may improve interaction with chronic pain patients.

The role of touch has been described within a number of different areas of healthcare including psychology (Milne, 1995), manual therapy (Lederman, 2005; Nathan, 1999) and perhaps, most prominently, nursing (Chang, 2001; Routasalo, 1999). While it has been identified that more research is required, nursing literature suggests that touch conveys connection and presence (Fredriksson, 1999; Sundin & Jansen, 2003), reassurance (Gleeson & Timmins, 2004; Sundin & Jansen, 2003), spirituality (Chang, 2001) and love and caring (Fredriksson, 1999; Sundin & Jansen, 2003). More recently, this literature has been supported by osteopathic research which suggests touch engenders a sense of care, trust and reassurance (Consedine, 2008). Although this dissertation is an exploratory study of touch within osteopathy, the findings have similarities to published nursing literature (Fredriksson, 1999; Gleeson & Timmins, 2004; Sundin & Jansen, 2003). More importantly, this literature suggests that the way in which osteopaths diagnose and treat patients is consistent with the biopsychosocial approach that is encouraged by chronic pain advocates.

1.3. Attitudes toward Chronic Pain

Before I discuss attitudes towards chronic pain, it is important to define what an attitude is and how it affects chronic pain management. The concise Oxford dictionary (2008) defines attitude as ‘a way of thinking or feeling about someone or something’. Although it is beyond the scope of this review, it is worth noting that attitudes have both genetic and learned components to them (Tesser, 1993) and so this is a complex multifaceted phenomenon. Consequently, the attitudes of both practitioners and patients have a significant impact on the management and experience of chronic pain.

1.3.1. Patient Attitudes to Pain

A number of manual therapy authors have noted that patient attitudes control or influence the outcome of the chronic pain experience (Geisser & Roth, 1998; Jensen, Turner, Romano, & Lawler, 1994; Riley, Ahern, & Follick, 1988). Although a proportion of these attitudes may be genetically coded, it is possible to change attitudes toward pain (Melzack, 2005; Tesser, 1993). These attitudes may be

influenced by factors such as gender (Riddell & Fitch, 1997), spirituality (Glover-Graf, Marini, Baker & Buck, 2007) or by the degree of knowledge and education they have about their condition (Geisser & Roth, 1998). Importantly, it has been shown that these attitudes can predict the subsequent pain experience and the degree to which patients are disabled by chronic pain.

1.3.1.1. The relationship between pain and disability

Pain in its most basic sense is a primitive warning of danger, a protective mechanism encouraging the person to remove themselves from harm. Significantly for clinicians, this mechanism persists with chronic pain patients well beyond the physical harm which may be present. This discrepancy between actual and perceived pain in chronic pain patients forms the basis for psychological disability (Eccleston & Crombez, 2007).

The correlation between chronic pain and disability has been well documented in the literature, perhaps most notably by Riley et al., (1988). These authors developed a pain and impairment relationship scale (PAIRS), which they used to assess the pain and disability attitudes of chronic pain patients. Their findings show that there was a clear correlation between pain and disability for chronic pain patients and that this disability is exacerbated by a healthcare system that attributes pain to impairment (Riley et al., 1988). Consequently, the authors recommended patients' focus be shifted from their pain and be diverted toward their functional ability. It was noted that the PAIRS survey showed robust psychometric properties with adequate internal consistency, construct validity and correlation to other instruments.

This relationship between pain and disability was supported by another study conducted by Jensen et al. (1994). Their questionnaire-based study explored the attitudes of 241 chronic pain patients. The authors found that patients felt disabled by their pain and they believed activity should be avoided because pain is associated with damage. The questionnaire also revealed that patients believed in the importance of emotions in the development of pain and that others should be more considerate of

those in pain. These findings support the idea that chronic pain has a significant psychological component.

1.3.1.2. Fear of Pain theories

There is speculation that the disability experienced by chronic pain patients is exacerbated by their fear of pain (De Peuter, de Jong, Crombez, & Vlaeyen, 2009). It is through this fear that patients worry and misinterpret the meaning of their pain. Clinically, this is labelled ‘pain catastrophising’ and is commonly found in chronic pain patients (Sullivan, Bishop & Pivik 1995). De Peuter et al (2009) discuss three results of pain catastrophising: Hypervigilance, escape and avoidance behaviours, and safety seeking behaviours. Hypervigilance is an enhanced state of sensory sensitivity, whereby increased awareness of pain is a direct result of the sufferer’s attempts to avoid it (De Peuter et al., 2009). Escape and avoidance behaviours are the behaviours a sufferer employs to evade the pain, such as abstaining from activity for fear of pain aggravation (Riley et al., 1988). Additionally, safety seeking behaviours involve active seeking of methods to reduce the catastrophe of the pain (De Peuter et al., 2009), such as attending one or more health professionals in search for a ‘cure’. It has been claimed this reinforces pain behaviours (Houben et al., 2005; Riley et al., 1988), further exacerbating the chronic pain dysfunction. However, with chronic pain these behaviours rarely result in a successful outcome and appear to further exacerbate the disabling nature of chronic pain (Arber, 2004).

How do these pain behaviours arise? It has been suggested that the patient’s fears concerning pain do appear to be out of genuine concern for malignancy and true damage (Hames, 2006; Leiper et al., 2006). A significant review conducted by Arber (2004) found nurses believed that patients’ behaviours surrounding pain were a conscious dramatisation by the individual. It has been suggested that pain catastrophising with chronic pain could also be partly explained by western societies’ preference for biomedical approaches to chronic pain (Eccleston & Crombez, 2007). The biomechanical orientation is based on the notion that pain and disability are a

direct consequence of physical pathology (Ostelo, Stomp-van den Berg, Vlaeyen, Wolters, & de Vet, 2003).

A number of studies have highlighted these behaviours. Varying levels of worry and affective distress were found amongst a population of headache sufferers (Leiper et al., 2006). Patients believed their pain had a major impact on life and were worried about the possibility of serious underlying causes for their pain. Patients also exhibited fear toward management strategies such as medication and the potential side effects. The lack of patient support and education may be a reason for this catastrophising (Leiper et al., 2006).

In another study, Geisser and Roth (1998) investigated this relationship by exploring whether patients' knowledge regarding their condition had any bearing on the disability of chronic pain. Those patients unaware of the diagnosis of their pain were seen to sensationalise their levels of pain and affective distress compared to those who were aware of their diagnosis (Geisser & Roth, 1998). Both of the studies above were qualitative with an adequate sample size and both papers reinforced patient education as crucial in affecting patients' pain behaviour. Additional factors known to modify the pain experience for patients are explained next.

1.3.1.3. Attitude Modifiers

1.3.1.3.1. Coping Strategies: Spirituality

The powerful influence of spirituality and religion has been well documented but only recently has its effect been researched among patients experiencing chronic pain. While under-researched, it is believed that spirituality provides patients with coping strategies and hope for recovery. With around 60% of New Zealand's population identifying with religious groups (Statistics New Zealand, 2009), this is a variable that healthcare providers need to consider when addressing the holistic needs of their patients.

Glover-Graf, Marini, Baker & Buck (2007) interviewed participants in a study that analysed the relationship between their spirituality and their chronic pain. The study revealed that spirituality and religion allowed patients to cope and accept their pain state and that it helped with guilt or worry they had with their condition. Spirituality helped to provide meaning and purpose to life, especially allowing a connection to others. The power of prayer was second only to medication, and Glover-Graf et al hypothesized that this may be because it reduced the importance of pain and provided hope for recovery (2007). While the study highlighted the effect of spirituality on chronic pain, the results need to be treated with caution, as participation was voluntary following a full description of the study and 80% of participants identified themselves as religious. This compares to a national average of 60% (Statistics New Zealand, 2009). This statistical difference may potentially be due to a higher proportion of religious followers among the chronic pain population.

Similarly, Wachholtz, Pearce & Koenig (2007) investigated spirituality by exploring literature relating to spirituality, coping and pain amongst chronic pain patients. The study revealed that individuals rely on spirituality to cope as it is associated with feelings of support, connection, peace and calmness. Spirituality often engendered a more positive mood and an increased ability to withstand negative situations. It was associated with positive health outcomes, including less depression and longer survival.

1.3.1.3.2. Gender influences on Pain

Similar to spirituality, gender can also affect how patients experience pain. In an effort to explore gender differences in pain perception and evaluation, Unruh et al (1999) conducted a telephone survey of community dwelling acute pain sufferers. The study showed that women presented with more pain at a higher intensity than men and that threat was associated with pain catastrophising in females. This was believed to lead to the increases in healthcare utilisation seen in the women of this study. In another study Riddell and Fitch (1997) investigated gender differences in a population of patients with chronic cancer pain. Women felt a real need to be stoical, maintain normality, and had a martyr-like desire to protect others during their incarceration.

Men, on the other hand, described being fed up with discussing pain, as they believed there was no benefit in others knowing about it.

Coward & Wilkie (2000) refute these findings in their research, which aimed to investigate the subjective meaning of metastatic bone cancer between males and females. Their study population shared similar themes associated with their perception of pain.

Although these studies identified gender differences, each population was either acute pain sufferers or chronic cancer pain sufferers. Thus, results need to be assessed with caution as these pain presentations may differ from the presentations and subsequent behaviours seen in chronic non-malignant pain.

A number of reasons have been postulated to explain the differences exhibited between males and females in pain perception. Gender specific diseases, anatomical variability and sex hormones have been proposed as significant contributors to pain experience (Berkley, 1997). However, recent research by Mitchley (2006) has questioned the validity of this idea. Mitchley (2006) aimed to address whether hormones played a role in pain perception by assessing whether the onset of ischaemic muscle pain in women varied throughout the menstrual cycle. Findings indicated that the pain threshold did not vary throughout the menstrual cycle and it was suggested further research be undertaken before sex hormones can be attributed to variable pain thresholds. Other authors have suggested that learned behaviours which are socially and culturally mediated may also help explain the differences in pain experience between genders (Berkley, 1997).

1.4. Health Professionals' perspective

“The way the medical community conceptualises what a pain patient is and how he should be treated, exemplifies how the medical community understands pain” (Vranken, 1989)

In the same way that a patients' pain experience can be influenced by a range of factors in their lives, it is reasonable to assume that practitioners' approach to pain is affected in the same way. Techniques and modalities for the treatment of chronic pain have been well investigated but the underlying attitudes and beliefs affecting the pain experience have received little attention from researchers. The attitudes and beliefs nurses had toward their patients may be more influential for positive outcomes than even their level of knowledge of care (Godin, Naccache, Morel, & Ebacher, 2000; Heath & Reid-Finlay, 1998) cited in Brown & Richardson. This factor may be contributing to the current state of disability among chronic pain patients.

1.4.1. Chronic Pain and the onset of disability

There is a strong connection between chronic pain and disability, a health concern that places tremendous strain on a nation's health system (Maniadakis & Gray, 2000). In light of this relationship that appears to be growing exponentially, Rainville et al (1995) aimed to assess the contribution of practitioners to this problem and elucidate the degree they related pain with disability. The formulation and application of the health care providers pain and impairment relationship scale (HC-PAIRS) was used to quantify the degree to which practitioners relate pain with disability. The findings suggested that the study population of community healthcare providers generally disagreed with the notion that pain justifies disability. The authors suggested that the varied beliefs reflected the variability in chronic pain treatment and advice in practice (Rainville, et al., 1995). This may explain why patients seek the advice of many healthcare practitioners throughout their chronic pain experience (Rainville et al., 1995). When these results were compared with results from specialised pain care providers, it was the specialised pain care providers who more strongly disagreed with the notion of pain and disability, indicating an inverse relationship between pain education and the beliefs of disability.

Linton, Vlaeyen & Ostelo (2002) compared physiotherapists' and general practitioners' attitudes towards chronic pain to interpret their beliefs regarding disability. Statements pertaining to disability showed that both physiotherapists and

general practitioners justified disability in various domains. More physiotherapists believed that a reduction of pain was required for a return to work, justifying functional disability. Contrary to this, physiotherapists were more likely to recommend exercises for chronic pain treatment. It is known that exercise and movement are steadfast philosophies of physiotherapy (New Zealand Society of physiotherapists, 2009), which are also recognised as a treatment protocol for chronic pain sufferers by health organisations (World Health Organisation, 2009).

There is a possibility that the beliefs that support chronic pain and disability stem from practitioners' inadequate management of their patients. In an attempt to fully understand chronic pain and why it is so disabling, pain science exposes the involvement of the psychological aspect of chronic pain.

1.4.2. Beliefs about the psychological aspects of pain

The psychology of chronic pain has recently received media attention and there is evidence that many practitioners are beginning to consider psychological factors more closely among their chronic pain patients.

Experienced physiotherapists in Smart & Doodys' study (2007) rated the psychological aspect of pain as important with chronic pain patients. Their attitudes stemmed from a robust grounding in the psychological aspects of chronic pain, which authors concluded formed a strong foundation for the 'holistic' assessment of their patients. Conversely, patients believed that pain should have a biomechanical cause, particularly if it is to be seen as 'real' by their healthcare practitioners (Werner & Malterud, 2003).

It must be remembered that chronic pain is a manifestation of dysfunction of both the psychological system and biomechanical systems. Vranken (1989) believes that chronic pain is a dualistic psycho-biologic phenomenon, and the importance of interpreting the proportion of physical pain and psychological pain is important in order to decide which intervention would be most appropriate (Arber, 2004).

Alternative evidence, however, does suggest that although there are increasing diagnoses implicating the cognitive behavioural model, these diagnoses may not have originated from an educated approach. Arber's review (2004) highlighted how nurses diagnosed psychological causes of back pain, irrespective of whether there were signs of tissue damage or not. Arber suggests that this could be due to limitations in medical knowledge, where a diagnosis of any description provides patients with a sense of control over experiences they would otherwise have little control over (Arber, 2004).

Additionally Soafer (1998) describes how nurses quickly assume psychological causes of pain and underestimate patients' personal accounts of pain, quickly choosing to link pain with emotion. Arber also highlights that treatment providers see the psychosocial aspect as a form of attention seeking on the patient's part and not a legitimate diagnosis (Arber, 2004). This tends to imply that the psychological dimension is an easy label for the less educated professionals to hide behind when a patient presents with persistent pain.

It is important to consider that, although these beliefs highlight the increasing importance of the psychological dimension, these studies do not address the actual treatment approaches employed by healthcare providers. It would be worth investigating beliefs alongside actual treatment approaches to ascertain if practitioners indeed practice what they claim they do.

1.4.3. The impact of practitioners' fear avoidance on patients' pain

Research has revealed the presence of pain-related fear among practitioners, an attitude that has already been alleged to facilitate the negative spiral of disability among patients (Sullivan, Bishop & Pivik, 1995).

Linton, Vlaeyen & Ostelos' study (2002) surveyed and compared the level of fear avoidance beliefs of physical therapists and general practitioners and related this to

their self-reported practice behaviours to back pain. Linton et al discovered that doctors appear to worry less than physical therapists concerning patients' complaints of pain while performing exercises or advising of exercises when pain is present. This occurs despite the fact that doctors were more convinced that intensity of pain was in direct correlation to degree of injury (Linton et al., 2002). However, physical therapists believed more so than doctors that a treatment could be successful even if a patient is still in pain, implying pain is less related to disability, despite their worry.

An article by Hames (2006) compared fear avoidance beliefs of patients and practitioners. The findings of patients support the previously mentioned relationship between patients' fear avoidance and the persistence of chronic pain (Linton et al., 2002). When subjects were shown photographs of body movements and activities, the study showed that practitioners judged certain activities as being more dangerous to patients than the patients did themselves. This indicated that practitioners may share with patients a misperception of risk of activity, thus contributing to iatrogenic disability through fear avoidant behaviours (Hames, 2006). Unfortunately many details regarding the procedure of the study were not included, therefore limiting the quality of the results. However, this review still supports fear avoidance surfacing within chronic pain research.

Fears around opioid use were found when Porcelli (2004) undertook a literature review, revealing fear for drug dependence and tolerance in patients. There was also fear of reprimand among disciplinary boards and that practitioners found it difficult to adequately assess a patient's pain unless it was reproducible, so they became conservative in their treatment for fear of patient harm (Porcelli, 2004). Although prescription rights are not within the osteopathic scope of practice in New Zealand (Sutherland, 2004), the fears surrounding the treatment protocol indicate some practitioners appear unconfident with the protocols they are meant to be trained to deliver. This may be due to levels of education in their respective fields of practice.

1.4.4. Continued Treatment: Continued Pain

In a mixed methods study of manual therapists, (Pincus, Vogel, Breen, Foster, & Underwood, 2006) investigated why practitioners continue to treat despite the persistent pain. Health practitioners saw themselves as not just healers but as counsellors, educators and health-maintainers (Pincus et al., 2006). Clinicians also commented on the time it takes to develop a trust relationship, but that this can become a hazard when patients come to rely on the support offered. In a few instances clinicians continued to treat to avoid the conflict in trying to discharge such a patient, and ultimately agreed it was the decision of the patient to keep returning (Pincus et al., 2006). For most clinicians there is a time guide for necessary patient referral but this was overridden in this set of data. Practitioners failed to trust other practitioners and back-referral to the general practitioner was seen as letting the patient down, throwing them into a healthcare void, as it was assumed there was little the doctor could do. Treatment providers claimed that in some cases they “had not exhausted their bag of tricks” (Pincus, et al., 2006 p.70) and felt a great obligation by their patients to perform. Parsons et al (2007) identified the importance of trust to both practitioners and patients, and the patient’s demand for continuity of care and need for a ‘diagnosis’ (verifying credibility). This may help explain why therapists continue to treat.

Daykin and Richardson (2004) conducted a qualitative study of physiotherapists and describe the frustration of the practitioner participants. Although their expectations were low with chronic pain patients, they continued to treat, due to the feeling they should be able to do something.

1.4.5. Attitude Modifiers

A number of factors have been investigated for their ability to modify attitudes towards chronic pain, including variables such as education, clinical experience, craft knowledge and culture. Only two articles investigated the attitudes and beliefs of osteopaths, however, many studies involved physiotherapists, a manual therapy which

shares a common philosophy with osteopaths concerning the importance of motion and activity for healing (New Zealand Society of Physiotherapists, 2009; Parsons & Marcer, 2006). Osteopaths, chiropractors and physiotherapists appear to be considered under the same umbrella of ‘manual therapies’ due to their similarity in treatment approaches (Evans, Foster, Underwood, Vogel, Breen & Pincus, 2005). However, they differ in their fundamental philosophies, and it would be of research interest to assess whether these core differences reflect the way they view pain and their treatment.

1.4.5.1. The Impact of Education

Understanding and knowledge affects chronic pain patients’ experiences and this is also known to influence healthcare practitioners. Daykin and Richardson revealed that practitioners themselves believe the level of education and clinical experience has a significant effect on their attitudes towards the pain experience (Daykin & Richardson, 2004).

Latimer et al utilised the HC-PAIRS tool to investigate the effects of a short course in pain education on the attitudes and beliefs of a population of physiotherapists (Latimer, Maher, & Refshauge, 2004). The results indicated that a short course in pain medicine has a statistically significant ability to change physiotherapy students’ beliefs on chronic low back pain, with less favouring the relationship of pain and disability. This result was maintained upon assessment one year later. A point of interest is the untrained students’ results were the same as some community healthcare workers. This indicated two factors: i) the need to provide a more consistent education programme to better equip all of those providers dealing with chronic patients on a day-to-day basis and ii) that some beliefs may be influenced by innate components or some other aspect other than a teaching institution.

One of the limitations of this study was the 50% response rate and the short nature of the course, which makes it difficult to compare to long-term education programmes. This limitation is reiterated in the findings where the participants’ post educative

results do not match exactly those results of the specialised clinicians. However, the results do change, with totals more closely resembling those results of the specialist pain clinicians. Extrapolating this may imply that education results in an inverse relationship between pain and disability (Rainville et al., 1995).

Simpson, Kautzmann and Dodd also undertook a survey that looked into the attitudes and beliefs of nurses before and after a mandatory annual workshop (Simpson, Kautzman, & Dodd, 2002). The survey was a series of true or false questions relating to pain management and resulted in an increase of correct answers post education. Interestingly, nurses outscored physicians on 5 of the 14 questions, with two questions indicating physicians did not believe the intensity of pain a patient was in, and that they should rate pain intensity, rather than the patient. These findings are supported by Arber's review that shows nurses neglect to address or believe patients' accounts of pain (Arber, 2004). Both Simpson et al (2002) and Arbers (2004) findings appear inconsistent with the definition that pain is a subjective experience, indicating a lack of knowledge of the true definition of pain. The findings do need to be treated with caution as the authors failed to describe what was taught in the annual workshop (Simpson et al., 2002). Responder bias may be present as participation was voluntary rather than random.

1.4.5.2. Clinical Experience

It has been assumed that clinical experience is associated with a greater level of education, especially those clinicians who solely work with chronic pain patients. In Rainville's study (1995), functional healthcare providers' results were compared to community healthcare providers. Functional healthcare providers are defined as practitioners who primarily deal with chronic pain patients, whereas community practitioners are those general practitioners who assess a variety of patient disorders. Functional healthcare providers scored lower than those community healthcare providers on the HC_PAIRS survey, which indicates that clinical experience encourages practitioners to disagree with the notion that pain justifies disability.

Smart and Doody (2007) investigated the clinical reasoning of pain in seven experienced musculoskeletal physiotherapists by qualitatively assessing their reactions to videos of patients in various pain states (Smart & Doody, 2007). All therapists demonstrated extensive biomedical orientation when discussing patient presentations; that the reason for pain was structural/anatomical or had biomechanical principles. This is logical when considering the treatment orientations of manual therapists, namely, that a biomechanical diagnosis leads to a manual therapeutic treatment. This orientation also appears to have influenced four of the seven participants in prognostic value (Smart & Doody, 2007). “He has a pretty good prognosis because he has a simple mechanical type presentation” (Smart & Doody, 2007 p 44). Smart and Doody make the assumption that mechanical causes of pain are easier or more successful to treat than non-mechanical causes. This supports the subjective findings of Daykin & Richardson’s study (2004). Psychosocial oriented reasoning was apparent with all participants. Strategies considered extrinsic factors of a patient’s life such as home and work life, and assessment of this aspect either had positive or negative implications on prognosis (Smart & Doody, 2007).

This is a critical revelation indicating that highly experienced practitioners assess each patient individually and holistically with a dynamic reasoning process. These findings support Vranken’s (1989) research regarding the twofold nature of chronic pain. It must be taken into consideration that under assessment circumstances, information may not indicate the practitioners’ views in reality. Data collection involved only one researcher and results may have differed with multiple researchers.

Findings from Rainville’s (1995) study indicate that those with clinical experience within the chronic pain field are significantly less likely to justify pain with disability, agreeing with the philosophy of movement and focusing on functional status rather than chasing pain (Riley et al., 1988). The findings above suggest that with education and clinical experience, there comes an understanding that non-malignant chronic low back pain does not justify limitation of function and disability.

Not all research, however, supports this idea. Two studies reveal that education may have the opposite effect in a nursing population in Helsinki. Niemi-Murola & associates inspected the way in which students respond to patients in pain by way of

questionnaire (Niemi-Murola, Nieminen, Kalso, & Poyhia, 2007). Attitudes towards elderly patients in pain, prescription of opioids and assessment of pain and anxiety concerning chronic pain and its treatment were assessed. Results indicated that the more education students received about chronic pain, the more concerned they were about meeting a patient and felt less confident in their ability to treat them. This finding is contrary to studies that imply education better prepares practitioners for chronic pain treatment (Latimer, Maher & Refshauge, 2004; Simpson, Kautzman & Dodd, 2002). The study by Niemi-Murola (2007) looked at the *interaction* with someone in pain, rather than one's *perception* of how they believed they would act. The article also acknowledges findings that imply the process of professionalism in the medical field may reinforce negative attitudes (Weinstein et al., 2000). It is suggested that with increased knowledge of the multi-factorial nature of chronic pain, the seemingly linear model of pain and healing in acute cases becomes confounded. This may be due to the responsibility of the physician becoming a burden (Pringle & Tyreman, 1993), encouraging practitioner fear avoidance beliefs. (Niemi-Murola et al., 2007).

1.4.5.3. The effect of Craft Knowledge on Education

The differences in education may also affect the interaction right from assessment through to treatment. Cherkin et al compared the beliefs and behaviours of chiropractors and family physicians to low back pain (Cherkin, MacCornack, & Berg, 1988). The two populations differed significantly on many factors, most of which seem to be due to their very different craft knowledge and education concerning pathology. Where drug therapy was the treatment of choice for physicians, spinal manipulation was that for chiropractors. Of the family physicians, 42% felt as though they were poorly prepared for back pain (three times more than that of chiropractors), and would openly take advantage of the placebo effect. Chiropractors were found to order multiple radiographs, compared to minimal orders by physicians, as they believed appropriate therapy does not require a precise diagnosis. This was based on the belief that most patients get better despite treatment. Physicians were also more likely to feel frustrated with patients, less likely to believe they can help future

exacerbations and less confident patients are satisfied with their care, than chiropractors in this sample (Cherkin et al., 1988). It appears that education concerning diagnosis and treatment is the dependant variable in these differences.

Brown investigated occupational therapists' treatment for their patients with chronic pain (Brown, 2002). A 63 item questionnaire was answered by 44 participants. This preliminary profile indicated a preference for education for self-management, possibly related to the profession's core of 'enabling occupation' (Brown, 2002). A paradoxical finding was the positive relationship between the belief of 'powerful doctors' and the endorsement of alternative therapies (Brown, 2002). The author's reasoning for this is the client-centred approach to patients (as is seen with many alternative treatments), while maintaining a medical model endorsing the concept of professional expertise. The major limitation of this study was a poor response rate. Practitioners revealed that craft knowledge was one of four major influences in their attitudes to chronic pain in Daykin and Richardson's study (2004).

1.4.5.4. Personal Experience with Pain

The subjective nature of pain has been discussed, and studies have investigated whether personal experiences of pain can affect judgement of another in pain. Both Latimer and Ferriera have shown results inconsistent with the notion that personal experience of low back pain should modify the beliefs of their patients in pain (Ferreira, Ferriera, Latimer, Maher, Refshauge, Sakamoto et al., 2004; Latimer et al., 2004). However, Thomas (1923) has shown that personal experience can modulate the way a person views pain in others (Clarke & Iphofen, 2005). Nurses' sympathy toward patients have also been shown to increase following personal back pain (Thomas, 2000). Daykin and Richardson further support this with practitioners' subjective belief that personal experience allowed them to be more empathetic towards their patients (Daykin & Richardson, 2004). It was suggested by Thomas (1923) that a practitioners ability to relate to their patients may be influenced by the practitioners own experiences with pain.

1.4.5.5. Culture

A number of studies indicate that low back pain is not expressed in a uniform manner across different cultures, with both prevalence and association to disability reduced in nations such as Hong Kong and Japan compared to many Western nations such as the United Kingdom and America (Brena, Sanders, & Motoyama, 1990; Lau, Egger, Coggon, Cooper, Valenti & O'Connell, 1995) cited in (Ferreira et al., 2004). Hispanic people are more likely to believe that life events are out of their control and employ fewer strategies to counter pain than other nations (Bates, Edwards, & Anderson, 1993). Ferriera (2004) compared the attitudes and beliefs of Australian physiotherapy students with a similar demographic of Brazilian students using the HC-PAIRS survey. Brazilian students were more likely to agree with the notion that chronic low back pain justifies disability and limitation of function than their Australian counterparts thus highlighting a possible cultural component to the pain interaction. These results may also be affected by educational qualifications of the participants. 22% of Australian participants having already completed a degree, compared to only 3% of the Brazilian students, which supports education exposure as an additional modifier. While this study is limited by the difference in respondent numbers between nations, it highlights the relationship between culture and pain behaviour.

In the literature review by Arber, an article by Beck also alluded to culture determining how cancer patients' pain is managed (Beck, 2000). It is generally culture which determines how one interacts within society. The Hispanic society is reported to believe that pain is beyond the realms of reason, where Western European society has a grounding in the biomedical aspects of pain but are stoical in nature and are found to internalise the suffering with pain (Arber, 2004).

Chiu, Trinka, Lim & Tuazon (2003) conducted a study of sub populations of final year nursing students from the Philippines and Australia. Students were evaluated on their pain knowledge in a 23 item pain knowledge test. It proved there was no significant difference in mean score for the quiz between nations, with both scoring generally low (8-9/23). The Philippine students performed better at questions

regarding disability, complex regional pain definition and acute pain management. Conversely the Australian students performed significantly better with questions related to treatment of chronic back pain, symptomatic allodynia and phantom limb pain. This study highlights the need for a more current version of pain science as this may impact on patient care (Chiu et al., 2003).

1.4.6. Allied belief systems bring positive outcomes for patients

A medical consultation is a twofold phenomenon; an exchange of symptoms for treatment. This review suggests both patient and practitioner attitudes toward pain can have an effect on the outcome of the experience. Several studies suggest a merging of belief systems will affect the outcome of patients in pain.

The concurrent beliefs, from the patient's perspective, have regarded the importance of the practitioner in the pain experience. The common theme among many studies was healthcare providers' validation of their patients' pain. Clarke & Iphofen (2005) revealed the importance that patients are believed. Paulson, Danielson & Norberg (1999) describe how patients need to have their pain confirmed by their practitioners. This validation allows their subjective perception to be perceived as real (Clarke & Iphofen, 2005).

It has been presumed that this need for validation has eventuated in patient behaviour modification. Werner & Malterud (2003) investigated chronic pain patients behaviour in a healthcare setting. While the sample is small, the results clearly identified patients 'role playing' or conforming to a behaviour they believed the doctor would want to see, in order for their situation to be believed (Werner & Malterud, 2003). This involved strategies such as assertiveness and surrendering, and patients did not want to be perceived as complainers. They concluded that this was linked to the belief that in order for pain to be seen as 'credible', it required a 'real' physical cause (Werner & Malterud, 2003). The need for a two-way assessment procedure was further qualified for adequate management (Raiman, 1986; Ruckert, 1995).

Although the importance of dual assessment has been raised, it is not simply a matter of just believing the patient. Patients have the ability of moulding reality (whether consciously or subconsciously), demanding the requirement for a degree of objectivity. Brown and Richardson have suggested that the co-ordination of belief systems achieves greater higher compliance and success rates with chronic pain (Brown & Richardson, 2006).

1.4.7. Osteopathic Attitudes

The research discussed so far clearly indicates that attitudes are affected by a variety of factors, and that these attitudes differ between professions. Both Cherkin et al., (1988) and Daykin & Richardson (2004) suggest craft knowledge influenced attitudes and treatment outcomes between professions. The osteopathic profession has its own philosophy based on the structure, function and self-healing properties of the body (Parsons & Marcer, 2006), so it is of particular interest that osteopathic attitudes to chronic pain are critiqued on their ability to affect practitioner beliefs systems.

There is little research in this field and only two articles discuss osteopathic attitudes toward chronic pain. The effectiveness of an information package on practitioner reported back pain behaviour and beliefs was tested on UK chiropractors, osteopaths and physiotherapists in a study by Evans et al., (2005). The package involved evidence-based guidelines, which research has suggested is lacking in these professions. Their aim was to compare attitudes of a test group who received the guidelines to a control group who did not receive any guidelines; and collect attitude responses six months post intervention. The results of this study are still pending.

Pincus et al., (2007) investigated the attitudes to back pain among chiropractors, osteopaths and physiotherapists. There were 465 responding practitioners (132 chiropractors, 159 osteopaths & 174 physiotherapists) who carried out the two part attitudes to back pain scale (ABS-mp). Findings suggested allied attitudes related to reactivation (returning to work, daily activities and mobilisation) and referral.

Evidence that suggests physiotherapists limit the amount of sessions more than osteopaths may appear opposite to classical views. However, it has been argued that physiotherapists are more likely to follow the self-care approach to low back pain and therefore have a greater tendency to limit sessions. The authors also argue that osteopaths and chiropractors may be more aware of individualising treatments for patients and additionally have the freedom to choose their approach within their own private practices. The psychological approach was endorsed by all, indicating that this approach is utilised in back pain practice; however, the willingness to engage in these problems was less for osteopaths than for both chiropractors and physiotherapists. It would be expected that due to the holistic underpinnings of osteopathic practice, osteopaths would be more active in addressing not only physical but mental dimensions of a patient's pain. This evidence suggests that the current osteopathic curriculum needs to address the psychological aspects of pain.

In light of research regarding the importance of touch and the all-inclusive 'holistic' role of osteopaths, it could be extrapolated that by providing a therapy that engenders support, trust and reassurance, osteopathy promotes health by addressing the dimensions of chronic pain. The fear avoidance beliefs that patients hold regarding pain (Pincus, Vogel, Savage, & Newman, 2000) have been shown to reduce with osteopathic treatment (Pringle & Tyreman, 1993).

1.5. Conclusion

The complex and multidimensional nature of chronic pain appears to be reflected in the haphazard but multitudinous collection of literature surrounding it. More specifically, there is limited literature regarding attitudes and beliefs of medical professionals (particularly osteopathy) toward chronic non-malignant pain. It is common knowledge that one's attitude towards something colours the reaction toward it. It is common knowledge also that patients seek a healthcare professionals' opinion on their pain. The limited research in this field may account for the lack of success in chronic pain treatment.

Health care professionals are aware of the current theories surrounding chronic pain, as well as the requirement for a thorough assessment and treatment, but somehow this knowledge is unable to be translated into practice.

The profession of osteopathy is in its relative infancy compared to other health care faculties, so it is unsurprising that research across all topics (including chronic pain) is limited. To address this, the study described in the next section investigated the following research topic: **What are the attitudes and beliefs of New Zealand osteopaths towards chronic pain and are these attitudes modified by professional status, education, clinical experience or gender?**

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Section 2: Manuscript

**Attitudes and beliefs of New Zealand osteopaths towards
chronic pain**

Attitudes and beliefs of New Zealand osteopaths towards chronic pain

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ABSTRACT

Attitudes and beliefs of New Zealand osteopaths towards chronic pain

Background: The attitudes and beliefs of osteopathic practitioners and students towards chronic pain may potentially affect the outcome of treatment. These attitudes and beliefs are thought to be influenced by factors such as professional status, education, gender and clinical experience. There is currently little data about the attitudes and beliefs of osteopaths about chronic pain.

Objective: The purpose of this study was to investigate the attitudes and beliefs of the New Zealand osteopathic population; establishing whether osteopaths agree with the notion that pain justifies disability and whether they prefer a biomechanical or behavioural orientation towards the treatment of chronic pain. Professional status, education, gender and clinical experience were assessed for their ability to adjust attitudes towards chronic pain.

Methods: A survey study design was implemented with two surveys (HC-PAIRS and PABS_PT) administered using coded email message or mailed letter. There were 242 respondents for the HC-PAIRS survey, and 232 for the PABS_PT survey. HC-PAIRS mean total scores were compared with published data from Australia, Brazil and North America; and PABS_PT mean total dimensional scores were compared to published data from the Netherlands. Pearson's correlation was performed between the HC-PAIRS and both dimensions of the PABS_PT.

Results: There were very few substantial differences when comparing New Zealand osteopaths and osteopathy students. Students appeared to prefer a behavioural orientation for chronic pain more than practitioners, and those who reported prior pain medicine education less preferred the biomechanical orientation for chronic pain than those participants with no pain medicine education. Attitudes that surfaced included disagreement with the notion that pain justifies disability, the importance of exercise and movement, and the agreement that a patient's view of their pain can have an affect on treatment outcomes. Additional attitudes imply osteopaths have an awareness of the mechanisms of chronic pain. Pearson's correlation between HC-PAIRS and biomechanical and behavioural dimensions of the PABS_PT, revealed correlation co-efficients of 0.56 and -0.07 respectively. There were small differences between the mean total scores of NZ osteopaths and healthcare professionals from Australia, Brazil, North America and the Netherlands; however, the clinical relevance of these findings is not clear.

Conclusion: There were very few substantial differences in the attitudes of the osteopathic population when comparing practitioner status, education, gender and clinical experience. Osteopaths' attitudes highlighted the perceived importance of exercise, patient beliefs, and an awareness of the current theories of the pain mechanisms in the management of chronic pain. New Zealand osteopaths (including students) neither strongly agree nor strongly disagree with the perception of pain as a justification for disability; nor do they strongly prefer a biomechanical or behavioural orientation for the treatment of chronic pain.

Key terms: Chronic pain; Attitudes; Beliefs; Osteopathy;

INTRODUCTION

Chronic non-malignant musculoskeletal pain has been highly correlated with disability,^{1, 2} No economic data is available for chronic non-malignant musculoskeletal pain, however, in the years 2000-2001 the New Zealand Accident Compensation Corporation (ACC) processed 6,660 ongoing claims for chronic low back pain alone, at a cost of \$68 million dollars.³ Chronic musculoskeletal pain is difficult to treat effectively, and most treatment approaches show only modest effectiveness.^{4, 5}

The difficulties in approaching and treating chronic musculoskeletal pain effectively may be partly explained by its multi-dimensional nature^{1, 6}. Psychological and social components are perhaps the most prominent dimensions that have been addressed in assessment and management of chronic pain^{7, 8}. Several theories have been postulated that attempt to integrate all dimensions. The evolving ‘pain neuromatrix’ theory first outlined by Melzack in 1965,⁹ describes the “multidimensional experience produced by characteristic ‘neurosignature’ patterns of nerve impulses generated by a widely distributed neural network- the ‘body-self neuromatrix’ in the brain”.⁶ (p 85) It is proposed that the neurosignature is genetically predetermined and is the primary mechanism that generates the neural pattern that produces pain.⁶ Pain behaviours and symptomology are determined by multiple influences, with peripheral nociception being only one of these.¹⁰

Beliefs that patients have about their pain can have a strong influence on management and treatment outcomes.¹¹⁻¹³ Studies investigating patient’s pain behaviour, have indicated that fear avoidance and catastrophising may arise from genuine concerns for their condition.¹⁴ Other studies have examined the subjective experience of chronic pain patients and reported that patients sometimes feel their pain can be invalidated by their treatment providers.¹⁵ This implicates a further role for the healthcare practitioner beyond application of therapeutic techniques for the treatment of chronic pain.

It has been demonstrated that patients with chronic pain believe that their pain justifies disability.¹³ These beliefs may be exacerbated by fear avoidance behaviours such as catastrophising^{16, 17} and kinesophobia.¹⁸ Tesser¹⁹ has argued a genetic basis for attitudes and it is suggested that patient attitudes and beliefs toward their pain are additionally influenced by factors such as culture,^{20, 21} media,^{22, 23} or spiritual background^{24, 25} and a patient’s knowledge of pain processes.¹¹

In addition to the role patient attitudes play in chronic pain, healthcare providers also hold attitudes and beliefs that influence their therapeutic approach. Within the context of increasing chronic pain and disability, it has been suggested that different practitioner beliefs about chronic pain may in part explain the lack of success in its treatment.²⁶ Physiotherapists^{20, 27} and nurses appear to be aware of psychological and social factors in the maintenance of chronic pain. Additional literature indicates a wide range of beliefs amongst practitioners regarding pain and disability and these may be modified by variables such as clinical experience,²⁰ education,²⁷ culture^{20, 21} and personal accounts of pain.^{28, 29} Even though there appears to be some awareness amongst practitioners of psychological factors in chronic pain, it has been observed that practitioners can, through their own attitudes and beliefs, contribute to fear avoidance behaviours in their patients^{16, 30}. This indicates that both practitioners and patients associate chronic pain with disability. Eccleston and Crombez suggests those in western society more easily relate pain to physical dysfunction,³¹ and this may support a societal attitude that chronic pain justifies disability.

Although the literature alludes to the importance of healthcare practitioner attitudes and beliefs, there is limited literature regarding musculoskeletal practitioners' (particularly osteopathic practitioners) attitudes towards chronic pain. The purpose of this investigation was to investigate the attitudes and beliefs that osteopaths hold towards chronic pain, and determine whether variables such as professional status, education or gender influence these beliefs.

Methods

Design

A questionnaire based cross sectional postal and web-based survey was used to assess the attitudes and beliefs of osteopaths and osteopathy students in New Zealand towards chronic pain.

Participants

Practitioners

New Zealand registered practitioners were identified using the public online register for the Osteopathic Council of NZ. The inclusion criteria for practitioners were the requirement to be registered and hold an annual practicing certificate as at March 1 2008. A total population of 370 practitioners met these criteria.

Students

Unitec Institute of Technology is the only accredited education provider for osteopathy in New Zealand. The undergraduate programme is a three year Bachelor's degree consisting of practical and theory components. Completion of an additional two year Masters degree including theoretical, research and clinical training is necessary for eligibility for registration. To be eligible for inclusion students needed to be enrolled in either the Bachelor or Master's Degrees at Unitec with the first year of enrolment in the Bachelor's degree not earlier than 2004.

Dependent variables

Health Care Providers' Pain and Impairment Relationship Scale

(HC-PAIRS)

The 'health care provider's pain and impairment relationship scale' (HC-PAIRS) was designed to assess practitioners' attitudes and beliefs about chronic pain^{2, 32} and serves as a predictor for work and activity recommendations.³² The scale is based upon the pain and impairment relationship scale (PAIRS) designed by Riley et al¹³ who investigated patients' beliefs about their chronic low back pain. The PAIRS was later

modified to assess practitioners' attitudes and includes 15 items.² Each item is a statement about chronic pain and respondents rate their agreement with each statement using a 7-point Likert scale, ranging from 'totally disagree' (1) to 'totally agree' (7). The higher a respondent's score, the stronger the belief that chronic low back pain justifies disability. Previous factor analyses for the HC-PAIRS instrument have identified four dimensions of attitudes and beliefs; 'functional expectations', 'social expectations', 'need for cure' and 'projected cognition'.² Both the PAIRS and HC-PAIRS have demonstrated robust validity, internal consistency, test-retest reliability, correlation to other similar scales¹³ and repeat factor analysis,^{27, 33}

The pain attitudes and beliefs scale for physiotherapists (PABS_PT)

The 'pain attitudes and beliefs scale for physiotherapists' (PABS_PT) was developed by Ostelo et al³⁴ and was designed to assess orientation towards treatment approach on two sub-scales: 'biomechanical' and 'behavioural'.³⁴ 'Biomechanically orientated' providers associate pain with physical disability, due to the belief that pain is a direct result of physical pathology; therefore it is proposed they follow a pain-contingent approach. By contrast, the behaviourally oriented providers encompass biopsychosocial paradigms in the maintenance of pain, where pain can exist in the absence of nociception. Behaviourally oriented providers are purported to follow a time-contingent treatment approach. The PABS_PT is a 31 item questionnaire that includes reference to diagnosis, treatment and advice.³⁴ Respondents score each item on a 6-point Likert scale, from 'totally disagree' (1) to 'totally agree' (6); without a 'neutral' point. The psychometric properties of the PABS_PT have not been extensively investigated, however, the pioneering study by Ostelo and colleagues have shown both subscales have adequate internal consistency.³⁴ It has been recommended that the behavioural orientation subscale be further developed to improve its internal consistency.³⁴

Procedures

Due to the small population of osteopaths in New Zealand, it was both financially and logically justifiable that the sampling frame constituted the target population. Both postal and web-based data collection methods were employed.

Where possible, practitioners identified from the OCNZ register were matched with email addresses identified in publicly available websites including business directories and industry websites. A personalised email invitation was sent to all email addresses which contained an explanation about the purpose of the research, along with a uniquely coded hyperlink to the questionnaires. On completion of the online survey, the coded link enabled registration of each participant's response and removed them from any follow-up invitations. Non-responders were sent three follow-up emails. Each email invitation included an opt-out option that allowed for the blocking of further follow-up emails.

In the case where email addresses were not attainable from public sources, postal addresses were collected from publicly available databases including telephone directories, professional directories and the Osteopathic Council online register. A cover letter and questionnaire booklet were posted to these participants together with a return self-addressed, prepaid envelope. Each return envelope was uniquely coded and marked off on a register on return of each survey. Coding ensured the preservation of anonymity and prevented subsequent mail-outs to those who had already participated. The questionnaire booklet was not coded in any way that would reveal the identity of the participant. To increase response rate for postal invitations,³⁵ envelopes were hand-addressed and hand-written self-adhesive notes were attached to the face of the questionnaire. Two follow-up questionnaires followed the initial mail-out to maximise response rate.³⁵

The student population were invited to submit email addresses to the school administrative office following verbal introduction and explanation of the research study to class groups. When email addresses were attained, an email invitation was sent in the same way as described for practitioners. Three follow-up invitations were made.

Data Analysis

Data Extraction and Exploration

Raw data was exported from the online survey provider into Excel for formatting and checking. Raw data was then imported into a statistical software package (SPSS

v16.0). Raw data was explored and analysed for normality using visual inspection of histograms, stem and leaf and Q-Q plots. The Shapiro-Wilk statistic and measures of skewness and kurtosis were calculated.

Demographics

Descriptive statistics were calculated for demographic data using cross-tabulation and frequency tables and plots. Response rates were calculated by dividing the number of respondents with completed surveys by the total number of accessible respondents.

Factor Descriptives

Means, standard deviations and 95% confidence intervals were calculated for HC-PAIRS total score for each group of respondents (students by year of enrolment; practitioners by years of clinical experience). Means and standard deviations were also calculated for the four factors and each of the 15 items of the HC-PAIRS and for the two factors and 31 items for the PABS_PT.

Independent t-tests were used to compare means for total score for HC-PAIRS and each sub-scale and item for both HC-PAIRS and PABS_PT across three different grouping variables; practitioner and student, those with or without education in pain medicine; and males and females. Levene's test of homogeneity was used to investigate equality of variances.^{36, 37}

To determine magnitude of effect, effect sizes were calculated using Pearson's r (where $r = \sqrt{[t^2 / (t^2 + df)]}$) as described by Field,³⁶ and interpreted according to Cohen's description.³⁸ Confidence intervals (95% CI) were constructed for the mean difference between each of the comparisons.

Comparison of means for HC-PAIRS total and sub-scales for both HC-PAIRS and PABS_PT were calculated for the following categories for years of clinical experience (0-5; 6-10; 11-20; 20-30; 30+ years) using a one-way analysis of variance with Bonferroni post-hoc tests.

The means and standard deviations for total HC-PAIRS scores and total factor scores for professional status were compared with previously published HC-PAIRS scores for various healthcare providers. The means and standard deviations for the two PABS_PT factors were compared with previously published data.³⁴

To investigate the relationship between the HC-PAIRS and PABS_PT instruments, Pearson's r was calculated for total HC-PAIRS score and each PABS_PT dimension. Means are reported as mean \pm SD.

Results

Demographics

The descriptive statistics for demographic data (institution of study, professional status, age, years in practice and hours worked per week) are presented in tables 1 and 2 and figures 1-3. Total number of returns was 242 for the HC-PAIRS survey (162 practitioners; 80 students); and 232 for the PABS_PT (155 practitioners; 77 students). There were seven spoiled responses for the HC-PAIRS survey and seventeen for the PABS_PT. Spoiled questionnaires were excluded from statistical analysis.

Practitioner Response

Of the 370 registered osteopaths holding current annual practicing certificates at 1 March 2008, there were 352 practitioners with email or postal addresses who were sent invitations to participate. A response rate of 46% (162/352) was achieved for the HC-PAIRS survey and 44% (155/352) for the PABS_PT.

The age category with the highest number of respondents was 36-45 (30%) (See figure 1). Unitec graduates comprised 23% (38/162) of the respondents, with the next most common institution being the British School of Osteopathy with 31 respondents (19%) (See table 1). A third of respondents reported a Masters degree as their highest qualification (See table 2) Respondents most commonly had either 0-5 (32.5%) or 10-20 (32.5%) years of clinical experience (See figure 2) and worked an average working week of 30-40 hours (40%) (See figure 3). Only 21 (13%) respondents claimed to have post graduate experience in pain medicine.

[Insert Figures 1, 2, 3.]

[Insert Tables 1, 2.]

Student response

Of 120 students enrolled in the Unitec osteopathy programmes at 1 March 2008, 99 students were able to be contacted via email. The response rate for this group was 80 (81%). Of year one, 52% of the population responded; 48% of year two; 62% of year three and 100% for each of years four and five. Students were typically younger in

age than practitioners with the most respondents in the 16-25 age brackets (see figure 1). Two students reported previous education in pain medicine (2.5%).

Contrasts between potential ‘Attitude modifying’ variables

Comparing Practitioners and Students

HC-PAIRS

A comparison of means for practitioners (n= 162) and students (n= 80) for the HC-PAIRS reveals a similar mean total score for practitioners (44.1+8.94) compared to students (45.44+7.72) (Table 3). The mean difference between the practitioners and students was 1.02 ($p= .382$; 95% CI for difference between means: -3.33 to 1.28; $r=.06$). Comparison of mean total scores across the four dimensions did not reveal any substantial differences between practitioners and students (see table 3). There were notable differences between practitioners and students for items 5 and 15 (see table 3) (See figure 4).

[Insert table 3.]

[Insert Figure 5.]

PABS_PT

A comparison of means for practitioners (n=155) and students (n=77) ‘behavioural orientation’ showed a lower mean score for practitioners (13.43+3.45) compared to students (15.25+2.80) (See table 4) (see figure 5). The mean difference was 1.81 ($p <.001$; 95% CI for difference between means: -2.6 to -0.98; $r=0.3$). There was no substantial difference between scores on the dimension ‘biomechanical orientation’ between practitioners (31.43+8.42) and students (31.42+7.91) ($p= 0.988$; 95% CI for difference between means: -2.23 to 2.29; $r \leq 0.1$) (see figure 6). There were notable differences between practitioners and students for items 1, 7, 9, 11, 12, 27 and 29. (see table 4).

[Insert table 4.]

[Insert Figure 6 and 7.]

Education in pain medicine

HC-PAIRS

Those respondents who claimed to have undertaken education in pain medicine (n=23) had a lower total score (42.48 + 9.65) than those who did not claim any prior pain medicine education (n=219; 44.99 + 8.42) (see table 5). The mean difference was 2.51 (p= .181; 95% CI for difference between means: -6.20 to -1.17; r= .09). 21 of the 23 claiming prior education were practitioners, with two students also having completed education in pain medicine in previous studies. These data were included in the analysis. Means for each of the four dimensions were not substantially different between those with and without pain education (see table 5). There were notable differences between those with education and those without for items 2, 3, 6, 8, 16 (see table 5).

[Insert table 5.]

PABS_PT

For the biomechanical dimension there was a difference between those with education in pain medicine (29.57+ 10.60) and those without (31.61+7.98) (mean difference = 2.04; p= .40; 95% CI for the difference between means: -6.97 to 2.89; r= .18) (see table 6). For the behavioural dimension there was no substantial difference between those with education in pain medicine (14.33+ 4.22) and those without (14.00+ 13.26) (mean difference = 0.33; p= 0.669; 95% CI for the difference between means: -1.19 to 1.84; r= .03) (see table 6). There were notable differences between those with education and those without for items 8, 13, 14, 17, 18 and 20 (See table 6).

[Insert Table 6.]

Gender

HC-PAIRS

A comparison of mean total scores showed females (44.44+ 8.07) as not substantially different from males (45.11+ 9.09) (see table 7) (see figure 4). (Mean difference = 0.67; p= 0.545; 95% CI for the difference between means -1.51 to 2.84; r=.04) (see table 7). Comparison of means for the four dimensions did not show notable differences between genders. There were notable differences between males and females for item 1 (see table 7).

[Insert table 7.]

[Insert Figure 5.]

PABS_PT

For the biomechanical dimension there were no differences between males and females (males 31.05 + 8.53; females 31.76 + 8.00; mean difference was 0.17; p=.515, 95% CI for the difference between means -2.85 to 1.43); ; r=.04) (see table 8) (see figure 5). Nor were there differences between males and females on the behavioural dimension (males 13.62 + 3.65; females 14.41+ 3.03; difference between means was 0.79; p= .075, 95% CI for the difference between means -1.67 to .08; r=.12) (See table 8) (see figure 6). There were notable differences between Males and females for items 10, 12, 28 and 29 (see table 8).

[Insert table 8.]

[Insert Figure 6 and 7.]

An analysis of variance (ANOVA) to compare mean differences for practitioner with different levels of clinical experience identified no sizeable differences between any of the categories (0-5, 5-10, 10-20, 20-30, 30+ years) for both HC-PAIRS and PABS_PT.

Pooled Osteopathic beliefs

As a result of the above comparative statistics revealing substantially similar results, the data were pooled and assessed for general osteopathic attitudes and beliefs toward chronic pain. Individual items were documented if the mean score indicated a strong

disagreement (Likert scores 0-2 HC-PAIRS; 0-1.75 PABS_PT) or strong agreement (Likert scores 4-6 HC-PAIRS; 3.25-5 PABS_PT) toward a statement.

HC-PAIRS

In the HC-PAIRS items that had a mean score on the Likert scale that represented disagreement were:

-
- 6 Chronic back pain patients owe it to themselves and those around them to perform their usual activities when their pain is bad
-
- 11 Chronic back pain patients have to accept that they are disabled because of their chronic pain
-
- 15 All of chronic back pain patient's problems would be solved if their pain would go away
-

And those items that represented agreement were:

-
- 10 When their pain gets worse, chronic back pain patients find it very hard to concentrate on anything else
-
- 13 Chronic back pain patients find themselves frequently thinking about their pain and what it has done to their life
-

PABS PT

For the PABS_PT, participants disagreed with items:

-
- 1 Back pain sufferers should refrain from all physical activity in order to avoid injury
-
- 8 Unilateral physical stress is not a cause of back pain
-
- 13 The best advice for back pain is 'take care' and 'make no unnecessary movements'
-
- 15 Back pain indicates that there is something dangerously wrong with the back
-
- 20 Back pain indicates the presence of organic injury
-
- 27 There is no effective treatment to eliminate back pain
-
- 29 Even if the pain has worsened, the intensity of the next treatment can be increased
-
- 31 The severity of tissue damage determines the level of pain
-

And agreed with items:

-
- 6 Mental stress can cause back pain even in the absence of tissue damage
-
- 16 The way patients view their pain influences the progress of the symptoms
-

Comparisons with other studies

HC-PAIRS

Analysis of confidence limits for mean total scores for HC-PAIRS across different providers and geographic locations indicates that there are clear differences between NZ osteopaths (including students) and physiotherapists in Australia; and North American healthcare providers and functional restoration providers (See table 9 and figure 7). The direction of these differences indicates NZ osteopaths agree more with the notion that pain justifies disability than the other providers. There is a clear difference between NZ osteopaths (including students) and Brazilian physiotherapy students. The mean total score for Brazilian students is higher than all other provider groups indicating that they agree with the notion that pain justifies disability compared to others (figure 7).

[Insert Table 9.]

[Insert Figure 7.]

PABS_PT

Analysis of confidence limits for mean total scores for biomechanical and behavioural dimensions for PABS_PT indicates that there are no meaningful differences between male and female osteopaths from NZ. There is a minor difference between Dutch male and female physiotherapists for the behavioural dimension, but only a trivial difference between males and females for the biomechanical dimension (See table 9 and figure 8). Analysis of confidence limits between NZ and Dutch practitioners show that there are also no substantial differences in mean total scores. These findings suggest NZ Osteopaths (including students) and Dutch physiotherapists have similar, moderate views on both biomechanical and behavioural orientation scales.

[Insert Table 10.]

[Insert Figure 8.]

Comparisons between HC-PAIRS and PABS_PT biomechanical and behavioural dimensions

There was a strong positive correlation between HC-PAIRS total and the biomechanical dimension of the PABS_PT (Pearson's $r = 0.564$; $R^2 = 0.32$). This result indicates that the two scales are probably measuring similar underlying traits; however, the correlation does show each instrument is slightly different in its analysis of participant attitudes to chronic pain. A weak, inverse relationship was found between the HC-PAIRS total and the behavioural dimension for PABS_PT (Pearson's $r = -0.07$; $R^2 = .01$). The lack of overlap probably means the items of each survey are not measuring similar traits of chronic pain.

Discussion

Overview

The aim of this study was to investigate the attitudes and beliefs towards chronic pain amongst the New Zealand osteopaths and osteopathy students. The results indicate that osteopaths do not hold extreme beliefs towards chronic pain and disability, and these beliefs do not appear to be influenced by professional status, education, gender or clinical experience.

General

Our results indicate that respondents hold moderate views towards chronic pain, and neither strongly agree or disagree with the notion that pain justifies disability.

Respondents do not appear to strongly favour either a biomechanical or behavioural orientation towards chronic pain. These statements are supported by median data for individual items and total dimensional and, for HC-PAIRS, total survey scores tending toward the middle of the Likert scale. Those items and dimensions that were associated with stronger attitudes, albeit sometimes slight, are discussed further below.

HC-PAIRS

Rainville et al² interprets that higher total scores correspond to respondents agreeing with the concept that pain justifies disability. Our results suggest respondents do not strongly agree or disagree with this notion; as median scores tend towards the middle of the range. No other studies appear to have interpreted total scores in this way; with authors having compared the total mean scores of various population, and concluding the larger scores more associated pain with disability. Although the relative difference is important in comparative studies, such analysis alone does not indicate where along the HC-PAIRS scale each of the respondent groups sit, and thus their actual attitudes towards pain and disability are not clearly defined.

When comparing the results of this study with other studies that have used the HC-PAIRS,^{2, 20} it is apparent there were both professional and geographical differences in

mean total scores. These differences were small and it is not clear if such differences would have any clinical impact. A suggestion for further study is to analyse attitudes to chronic pain alongside actual treatment practices. An interesting analysis would be to quantify the minimum difference in attitude score (both within and between professions) that would result in an observable and meaningful difference in the treatment process.

PABS_PT

The total scores for the two dimensions of the PABS_PT (biomechanical and behavioural orientations) showed no indication that the respondents have directional preferences for either orientation. On comparison with Dutch physiotherapists,³⁴ however, osteopaths tend to slightly favour a biomechanical orientation, suggesting that NZ osteopaths are more in agreement with the concept that pain is a signal of physical pathology, and thus disability.²

Discussion of individual items where respondents reported stronger views

The diverse and variable treatment approaches of osteopaths may partly explain the variation of attitudes that are apparent in this population.³⁹ Although the median scores for respondents indicated moderate views towards pain and disability, there were two individual items where respondents held strong views that pain did not justify disability (items 11 and 15 HC-PAIRS). As this is the first time attitudes surrounding chronic pain have been investigated in this population there is no other data available to determine whether these findings are valid or random events. Other studies that used the HC-PAIRS tool have not documented whether their participants findings were consistent with these. In apparent contrast to responses toward items 11 and 15, participants disagreed that '*patients owe it to themselves and those around them that they should perform their usual activities when their pain is bad*' (item 6). This suggests that osteopaths believe, at times, that disability is justified. This contradiction may be due to the philosophical underpinnings of the holistic and individual approach osteopathy claims towards patient assessment and treatment.⁴⁰

Respondents appear to disagree with the notion that chronic pain patients should avoid physical activity and unnecessary movement (Items 1 and 13 PABS_PT). This finding is consistent with the messages conveyed in a recent public campaign over two states in Australia that reinforce the benefit of physical activity for improving back pain.²² The benefits of activity are widely promoted by health promotion agencies in the media such as the NZ Accident Compensation Commission⁴¹ and the World Health organisation, which both encourage activity to prevent disability.⁴²

Respondents had the view that chronic pain was not allied to peripheral damage and that mental stress can cause back pain, even in the absence of tissue damage (items 6, 20 and 31 PABS_PT). They also believed treatment should not be pain contingent (Item 29 PABS_PT). In the study by Ostelo et al, Dutch physiotherapists also believed that peripheral damage was not necessary in chronic pain, and that treatment should not be dependent on a pain contingent approach³⁴. This international concordance may imply there is an increasing awareness toward the current theories that implicate the brain in both construction and maintenance of chronic pain states. Melzack's evolving 'neuromatrix of pain' theory implicates the psychological influence in chronic pain states.⁶

Participants disagreed with item 15 on the PABS_PT '*Back pain indicates that there is something dangerously wrong with the back*'. Dutch physiotherapists also disagreed with this item,³⁴ which is in line with the New Zealand and Dutch guidelines for health.^{34, 43} These views contrast with studies that show patients were genuinely concerned for their health and displayed fear avoidance behaviours such as catastrophising, kinesophobia and hypervigilance.¹⁸ These findings are of professions other than osteopathy, so caution must be taken when generalising these findings to the New Zealand osteopathic setting. Investigation into the attitudes and beliefs of patients seeking osteopathic care would be a worthy complementary study to ascertain their attitudes towards chronic pain as well as investigating whether these attitudes influence the choice of therapy they choose.

Finally, respondents believed there is an effective treatment for back pain (Item 27), however, this single item does not provide any clarification about what treatment approaches participants deemed beneficial. It is reasonable to assume that due to the

‘treatment provider’ status of osteopaths, that they would advocate treatment for chronic pain.

Professional Status

In this study there were no substantial differences in the attitudes and beliefs of pain and disability between practitioners and students (HC-PAIRS). The PABS_PT questionnaire revealed students were more behaviourally oriented than practitioners. This is contrary to expectations that practitioners would score higher for this orientation, due to their clinical experience and exposure to chronic pain states in practice. A possible explanation is that osteopathic practitioners receive a rich biomechanical education, by virtue of their manual profession. Their beliefs are most probably influenced by the treatment methods they routinely employ. Daykin and Richardson²⁸ support this theory with the belief that craft knowledge is an important determinant of chronic pain beliefs. Although the psychological contribution to chronic pain has been recently highlighted as a relevant theory to explain aspects of chronic pain,⁶ it would be inaccurate to assume respondents are actually aware of these theories or apply them to practice. It is reasonable to assume that practitioners educated at various times have different levels of education about chronic pain, and thus variable treatment attitudes and approaches toward it. Additionally, current students may have more exposure to the more recent theories, so collectively these suggestions may explains the small differences seen between practitioner and students.

With regards to the PABS_PT, practitioners agree more with the notion that activity is important (item 1 and 13) than students. This response is consistent with both NZ and international guidelines that promote activity as beneficial for back pain.^{41, 44}

Interestingly, practitioners disagreed more with item 11 ‘*A patient suffering from severe back pain will benefit from physical exercise*’. The way this item is responded to, may depend on how the reader defines ‘severe’. This term is defined in common day language as meaning intensity, however, more accurate clinical definition of severity is defined as the extent to which pain impacts activities of daily living.⁴⁵ Practitioners also believed in the importance in finding a diagnosis (item 7) and treating chronic pain (item 27). It is hardly surprising given that respondents were

practitioners (or training to be) who routinely diagnose and treat people with chronic pain.

Education

Education has been shown to influence on healthcare practitioner's attitudes towards chronic pain.²⁷ In the current study only small differences in attitudes and beliefs were found between those with pain medicine education and those without. A major restriction in this analysis was the small sample size of those who claimed to be 'educated' in pain medicine. An additional limitation was the lack of an operational definition for 'education in pain medicine' in the questionnaire. With the definition undefined, the ability to draw strong conclusions from the data was limited. A suggestion for future work would be to clearly define education.

Alternatively an educational intervention study is suggested to more accurately assess the effect of education on changing attitudes and beliefs. Latimer et al²⁷ employed such a method and found that a short course in pain medicine modified physiotherapists attitudes such that after the intervention they agreed less with the notion that pain justified disability.

In contrast, Niemi-Murola et al found that Helsinki nurses felt less capable of treating chronic pain patients following pain education.⁴⁶ A potential explanation for this contrast in findings was that Neimi-Murola et al⁴⁶ investigated the attitudes of nurses throughout a treatment encounter, where Laitmer et al²⁷ investigated practitioner perceptions toward a theoretical treatment encounter. In order to more accurately assess whether participants' perceptions about attitudes and beliefs are reflected in practice, field observations of practitioners in real settings would be useful.

Those with education in pain medicine agreed less with the biomechanical dimension of the PABS_PT than those who have no specific pain medicine education. The operational definition for the biomechanical orientation is '*one in which the healthcare provider believes in a biomedical model of disease, where disability and pain are a consequence of specific pathology.*'⁴⁷ It could be assumed that those with pain medicine education have had more exposure to the current theories regarding

chronic pain that implicate more than physical pathology,⁶ therefore this result would be expected. In light of the limitations of sample size and operational definition described above, these findings should be interpreted cautiously.

The differences in attitudes between those with education in pain medicine and those without, indicated those with education have a slightly stronger disagreement with the concept that pain justifies disability. Once again this would be expected in a population theoretically educated on current theories regarding chronic pain mechanisms.⁶

Gender

There were no considerable differences in either instrument when comparing males and females, indicating male and female osteopaths have similar attitudes toward chronic pain. In a study by Coward and Wilkie⁴⁸ similar findings were identified, where both male and female patients had similar beliefs regarding chronic pain.

Clinical experience

Practitioners' clinical experience did not appear to have an effect on the attitudes and beliefs towards chronic pain. This was contrary to expectation in that clinical experience is likely allied to greater awareness of the factors that influence chronic pain states. A likely explanation is that clinical experience is not accurately represented by time alone and may be determined by other factors such as patient exposure, fulltime work or specific clinical situations. It would be suggested that this factor either be relabelled or more clearly defined.

Validity

Both instruments reinforced the content and construct validity and reliability as measured in previous studies.^{33, 34} Ostelo et al³⁴ suggested the behavioural dimension of the PABS_PT be reviewed to improve its internal consistency. Houben et al³³ later modified the PABS_PT and improved its internal consistency, however, both studies retained the same factor structure. The high correlation between the original

PABS_PT and the HC-PAIRS survey,³⁴ justifies the decision to use the original instrument in the current study.

Due to the relatively small and approachable size of the New Zealand osteopathic population, it was both financially and practically logistical that the total population was surveyed. This eliminated selection bias and, together with the high response rate, reinforced generalisability of our findings to the whole population of NZ osteopaths.

Several steps were taken to maximise the response rate including the use of hand addressed envelopes and fluorescent, handwritten thank you notes on mailed questionnaires,⁴⁹ and a personalised welcome note on the emailed version.

Limitations

All surveys are subject to responder bias, as it can never be assured that the way a participant responds reflects how they would respond in real life. An additional limitation may have been the way the questionnaires were distributed. It was financially viable to email those respondents who we had email addresses for, with the remaining receiving postal versions. There may have been responder bias to either of the media. This is both speculative and unavoidable; unless participants were presented with both media to select from.

The relevance of the neutral option in the HC_PAIRS survey Likert scale is questionable. When assessing beliefs, a neutral option provides no information on the participants' view in any one direction, essentially rendering a statement redundant. Finally, the demographic questions that contained continuous responses (For example: age, years of practice, hours worked per week etc.) were categorised in this study. Average results could not be recorded in this way, posing limitations in their analysis. It would be suggested that future research questions are left open to record the continuous data, rather than categorise them.

Suggestions

This study has provided preliminary data on the attitudes and beliefs of the New Zealand osteopathic profession. Additional to the suggestions already stated, instrument modification would be the logical next step in ensuring the robustness of

the individual items. By rearranging the order of the statements or using a split test, this would help assess whether item order had an impact on the resultant responses.

It is a further suggestion that the findings of this study are compared and contrasted to actual clinical encounters to assess whether these attitudes persist in real practice.

Conclusion

This study revealed that there were no substantial differences in attitudes and beliefs to chronic pain when comparing practitioners and students; those with and without education in pain medicine; males and females or clinical experience. There were small differences between practitioners and students; students were more behaviourally oriented in their attitudes than practitioners. Respondents with education disagreed more with the biomechanical orientation than those without education in pain medicine. However these findings should be interpreted cautiously as differences were only small and the small sample size of people with prior pain medicine experience and lack of operational definitions for education limited the findings generalisability.

The majority of respondents indicated that patient activity and their view towards pain is important for successful outcome. The findings of this study suggest NZ osteopaths and students are cogniscent of the psychological factors that contribute to chronic pain.

This study supports the conclusion that osteopaths do not hold extreme views about pain justifying disability. Further, they do not appear to strongly prefer a biomechanical or behavioural orientation towards chronic pain.

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TABLES & FIGURES

Table 1: Cross tabulation of the number (n) of practitioners and institution of study

Institution	Practitioners (n)
British School of Osteopathy	31
British College of Naturopathy and Osteopathy	20
British College of Osteopathic Medicine	1
College of Osteopaths, United Kingdom	3
European School of Osteopathy	16
International College of Osteopathy, Australia	2
London College of Osteopathic Medicine, United Kingdom	1
London School of Osteopathy, United Kingdom	3
Osteopathic College of New Zealand	22
Oxford Brookes University, United Kingdom	1
New South Wales College of Osteopathy, Sydney	1
Phillip Institute Of Technology, Australia	1
Royal Melbourne Institute of Technology, Australia	13
South Pacific College of Naturopathy and Osteopathy, New Zealand	2
Unitec School of Osteopathy, New Zealand	38
University of Western Sydney, Australia	1
Victoria University, Australia	6
Total	162

Table 2. Cross tabulation of professional status and highest qualification

Qualification	Professional status	
	Practitioner	Student
None	3	32
Diploma	45	5
Bachelors Degree	19	35
Honors Degree	39	4
Masters Degree	54	4
PhD or Doctoral Degree	2	0

Table 3. Table of Practitioner and student scores for HC-PAIRS

N= 242	Prac (n=162)	SD	Student		P- value ^[2]	t	95% CI for the mean difference		Mean Diff (Abs)	Effect Size ^[1] (r)
			Mean	Mean			SD	Lower	Upper	
HC-PAIRS total	44.41	8.94	45.44	7.72	.382	-.876	-3.33	1.28	1.02	.06
Dimension Functional Expectations	25.16	6.45	25.28	5.72	.893	-.135	-1.79	1.56	.12	<.01
Dimension Social Expectations	11.08	3.12	11.44	2.63	.379	-.881	-1.16	0.44	.36	.06
Dimension Need for Cure	8.06	3.26	8.56	2.92	.246	-1.163	-1.35	0.35	.50	.07
Dimension Projected Cognition	8.60	1.72	8.44	1.97	.534	.623	-.35	.67	.16	.05
Chronic pain patients can still be expected to fulfil work and family responsibilities despite pain (HC1)	3.30	1.56	3.12	1.35	.363	.912	-.21	.56	.18	.07
An increase in pain is an indicator that a chronic back pain patient should stop what they are doing until the pain decreases (HC2)	3.30	1.54	3.44	1.47	.498	-.679	-5.51	.27	.14	.04
Chronic back pain patients cannot go about normal life activities when they are in pain (HC3)	2.80	1.57	2.88	1.65	.718	-.361	-.51	.35	.08	.02
If their pain would go away, chronic back pain patients would be every bit as active as they used to be (HC4)	3.21	1.59	3.32	1.50	.590	-.540	-5.35	.31	.12	.03
Chronic back pain patients should have the same benefits as the handicapped because of their chronic pain problem (HC5)	2.36	1.50	2.91	1.34	.005	-2.874	-.93	-.17	.55	.20
Chronic back pain patients owe it to themselves and those around them to perform their usual activities when their pain is bad (HC6)	1.95	1.36	1.95	1.24	.997	.003	-.35	.36	<.01	<.01
Most people expect too much of chronic back pain patients, given their pain (HC7)	3.27	1.26	3.10	1.03	.276	1.092	-.13	.46	.17	.08
Chronic back pain patients have to be careful not to do anything that might make their pain worse (HC8)	3.21	1.56	3.51	1.61	.161	-1.407	-.73	.12	.30	.09
As long as they are in pain, chronic back pain patients will never be able to live as well as they did before (HC9)	3.25	1.62	3.14	1.66	.624	.490	-.33	.55	.11	.03
When their pain gets worse, chronic back pain patients find it very hard to concentrate on anything else (HC10)	4.33	0.99	4.31	1.12	.917	.104	-.26	.29	.02	<.01
Chronic back pain patients have to accept that they are disabled	1.98	1.40	2.04	1.25	.736	-.337	-.43	.30	.06	.02

	95% CI for the mean difference									
because of their chronic pain (HC11)										
There is no way that chronic back pain patients can return to doing the things they used to do unless they find a cure for their pain (HC12)	2.12	1.47	2.10	1.44	.931	.087	-.38	.41	.02	<.01
Chronic back pain patients find themselves frequently thinking about their pain and what it has done to their life (HC13)	4.27	1.05	4.12	1.25	.337	.906	-.17	.47	.15	.08
Even though their pain is always there, chronic back pain patients often don't notice it at all when they are keeping themselves busy (HC14)	3.48	1.22	3.39	1.11	.587	.544	-.23	.41	.09	.04
All of chronic back pain patient's problems would be solved if their pain would go away (HC15)	1.60	1.53	2.10	1.49	.017	-2.393	-.90	-.88	.50	.15

Notes

- Abbreviations: HC1 etc represent the item from the questionnaire; Prac = practitioners; CI = confidence interval; Mean Diff = Mean Difference; Abs = Absolute;
- Effect sizes were calculated as described by Field³⁶
 - The P-value reported is from an independent t-test for the difference in score between Practitioners and Students. The P-value, test statistic and confidence interval reported is dependent on the assumption of equal / non-equal variance as determined by Levene's test (not reported here)

Table 4.Table of Practitioner and student scores for PABS_PT

N= 232	Prac (n=155)		Student (n=77)		P- Value ^[2]	t	95% CI		Mean Diff (Abs)	Effect Size ^[1] (r)
	Mean	(SD)	Mean	(SD)			Lower	Upper		
Dimension 1: Biomechanical Orientation	31.43	8.42	31.42	7.91	.988	.014	-2.25	2.29	.02	<.01
Dimension 2: Behavioural Orientation	13.43	3.45	15.25	2.80	.000	-4.297	-2.6	-.98	1.81	.30
Back pain sufferers should refrain from all physical activity in order to avoid injury (PA1)	.79	.88	1.06	.92	.027	-2.224	-.52	-.03	.28	.15
Good posture prevents back pain (PA2)	2.88	1.08	2.87	1.09	.962	.048	-.29	.31	.01	<.01
Knowledge of the tissue damage is not necessary for effective therapy (PA3)	1.86	1.27	1.65	1.11	.220	1.230	-.13	.54	.21	.08
Reduction of daily physical exertion is a significant factor in treating back pain (PA4)	1.97	1.10	2.00	1.05	.831	-.214	-.33	.27	.03	.01
Not enough effort is made to find the underlying organic causes of back pain (PA5)	2.76	1.11	2.58	.92	.229	1.205	-.11	.47	.18	.08
Mental stress can cause back pain even in the absence of tissue damage (PA6)	3.72	.99	3.87	.87	.247	-1.161	-.42	.11	.15	.08
The cause of back pain is unknown (PA7)	1.66	1.16	2.10	1.00	.003	-2.997	-.73	-.15	.44	.22
Unilateral physical stress is not a cause of back pain (PA8)	1.49	1.10	1.51	.77	.897	-.130	-.26	.23	.02	.01
Patients who have suffered back pain should avoid activities that stress the back (PA9)	2.01	1.22	2.44	1.02	.008	-2.697	-.75	-.12	.44	.18
Pain is a nociceptive stimulus, indicating tissue damage (PA10)	2.46	1.24	2.44	1.38	.927	.092	-.34	.37	.02	.01
A patients suffering from severe back pain will benefit from physical exercise (PA11)	2.83	1.16	3.21	.88	.006	-2.796	-.65	-.11	.38	.20

Functional limitations associated with back pain are the result of psychosocial factors (PA12)	2.15	1.02	2.69	.83	.000	-4.259	-.78	-.29	.53	.30
The best advice for back pain is: 'Take care' and 'Make no unnecessary movements' (PA13)	1.29	1.09	1.32	1.06	.819	-.229	-.33	.26	.03	.02
Patients with back pain should preferably practice only pain free movements (PA14)	2.15	1.07	2.23	1.04	.563	-.579	-.38	.21	.09	.04
Back pain indicates that there is something dangerously wrong with the back (PA15)	1.05	1.07	1.25	.73	.092	-1.691	-.44	.03	.20	.12
The way patients view their pain influences the progress of the symptoms (PA16)	3.88	.93	3.91	.99	.849	-.191	-.29	.24	.03	.01
Therapy may have been successful even if pain remains (PA17)	3.01	.95	3.18	1.00	.212	-1.252	-.44	.10	.17	.08
Therapy can completely alleviate the functional symptoms caused by back pain (PA18)	2.88	1.30	2.77	1.05	.492	.688	-.22	.45	.12	.05
If activities of daily living (eg dressing, cooking, bathing) cause more back pain, this is not dangerous (PA19)	2.42	1.10	2.19	1.08	.141	1.476	-.08	.52	.23	.10
Back pain indicates the presence of organic injury (PA20)	1.85	1.19	2.10	1.11	.112	-1.595	-.58	.06	.26	.10
Sport should not be recommended for patients with back pain (PA21)	1.66	1.15	1.84	.99	.219	-1.233	-.47	.11	.18	.09
If back pain increases in severity, I immediately adjust the intensity of my treatment accordingly (PA22)	3.10	1.28	2.81	1.28	.103	1.636	-.06	.64	.29	.11
If therapy does not result in a reduction in back pain, there is a high risk of severe restrictions in the long term (PA23)	2.10	1.12	2.23	.89	.337	-0.963	-.40	.14	.13	.07
Pain reduction is a precondition for the restoration of normal functioning (PA24)	2.83	1.12	2.73	1.06	.521	0.643	-.20	.40	.10	.04
Increased pain indicates new tissue damage or the spread of existing damage (PA25)	2.03	1.10	2.05	1.01	.895	-0.132	-.31	.28	.02	.01
It is the task of the osteopath to remove the cause of back pain (PA26)	2.76	1.35	2.43	1.18	.066	1.844	-.02	.69	.33	.12

There is no effective treatment to eliminate back pain (PA27)	1.21	1.16	1.73	.98	.001	-3.336	-.82	-.21	.51	.20
Electrotherapy (eg TENS, ultrasound) and/or back braces support functional recovery (PA28)	2.21	1.07	2.36	.95	.295	-1.050	-.43	.13	.15	.07
Even if the pain has worsened, the intensity of the next treatment can be increased (PA29)	1.63	.95	1.94	.89	.018	-2.383	-.55	-.05	.30	.20
If patients complain of pain during exercise, I worry damage is being caused (PA30)	2.45	.95	2.38	.97	.608	0.514	-.19	.33	.07	.03
The severity of tissue damage determines the level of pain (PA31)	1.69	1.21	1.66	1.26	.870	0.164	-.31	.37	.03	.01

Notes

Abbreviations: PA1 etc represent the item from the questionnaire; Prac = practitioners; CI = confidence interval; Mean Diff = Mean differences; Abs = Absolute;

1. Effect sizes were calculated as described by Field³⁶
2. The P-value reported is from an independent t-test for the difference in score between Practitioners and Students. The P-value, test statistic and confidence interval reported is dependent on the assumption of equal / non-equal variance as determined by Levene's test (not reported here)

Table 5. Table of Education in pain medicine scores for HC-PAIRS

N=242		Education (n=23) Mean	(SD)	No Education (n=219) Mean	(SD)	P- Value [2]	t	95% CI		Mean Diff (abs)	Effect Size [1] (r)
								Lower	Upper		
	HC-PAIRS total	42.48	9.65	44.99	8.42	.181	-1.343	-6.20	1.17	2.51	.09
Dimension	Functional Expectations	23.26	6.99	25.40	6.11	.116	-1.578	-4.81	.53	2.14	.10
	Social Expectations	10.57	4.19	11.26	2.81	.441	-1.077	-2.54	1.14	.70	.12
	Need for Cure	7.61	3.23	8.29	3.14	.324	.989	-2.05	.68	.68	.06
	Projected Cognition	9.04	1.87	8.49	1.80	.165	1.393	-.23	1.33	.55	.09
Chronic pain patients can still be expected to fulfil work and family responsibilities despite pain (HC1)		3.74	1.48	3.19	1.49	.094	1.680	-.10	1.19	.55	.11
An increase in pain is an indicator that a chronic back pain patient should stop what they are doing until the pain decreases (HC2)		2.35	1.75	3.45	1.46	.001	-3.372	-1.74	-.46	1.10	.21
Chronic back pain patients cannot go about normal life activities when they are in pain (HC3)		1.96	1.64	2.91	1.56	.006	-2.778	-1.64	-.28	.96	.12
If their pain would go away, chronic back pain patients would be every bit as active as they used to be (HC4)		3.26	2.01	3.25	1.51	.974	.033	-.87	.90	.01	.01
Chronic back pain patients should have the same benefits as the handicapped because of their chronic pain problem (HC5)		2.26	1.82	2.58	1.43	.330	-.977	-.95	.32	.31	.06
Chronic back pain patients owe it to themselves and those around them to perform their usual activities when their pain is bad (HC6)		2.74	1.63	1.87	1.26	.020	2.488	.15	1.59	.87	.45
Most people expect too much of chronic back pain patients, given their pain (HC7)		2.96	1.26	3.24	1.18	.282	-1.079	-.79	.23	.28	.07
Chronic back pain patients have to be careful not to do anything that might make their pain worse (HC8)		2.61	1.85	3.38	1.53	.025	-2.260	-1.45	-.10	.78	.14
As long as they are in pain, chronic back pain patients will never be able to live as well as they did before (HC9)		3.22	1.83	3.21	1.61	.984	.021	-.70	.71	.01	<.01
When their pain gets worse, chronic back pain patients find it very hard to concentrate on anything else (HC10)		4.39	1.37	4.32	.99	.737	.336	-.37	.52	.08	.02
Chronic back pain patients have to accept that they are disabled because		1.83	1.47	2.01	1.34	.526	-.635	-.77	.40	.19	.04

of their chronic pain (**HC11**)

There is no way that chronic back pain patients can return to doing the things they used to do unless they find a cure for their pain (HC12)	1.87	1.60	2.14	1.44	.403	-.838	-.90	.36	.27	.05
Chronic back pain patients find themselves frequently thinking about their pain and what it has done to their life (HC13)	4.65	.98	4.18	1.12	.052	1.950	-.01	.95	.47	.12
Even though their pain is always there, chronic back pain patients often don't notice it at all when they are keeping themselves busy (HC14)	3.52	1.38	3.44	1.16	.748	.322	-.43	.59	.08	.02
All of chronic back pain patient's problems would be solved if their pain would go away (HC15)	1.13	1.46	1.84	1.52	.035	-2.120	-1.36	-.05	.71	.14

Notes :

- Abbreviations: HC1 etc represent the item from the questionnaire; med = medicine; CI = confidence interval; Mean Diff = Mean difference; Abs = Absolute;
1. Effect sizes were calculated as described by Field³⁶
 2. The P-value reported is from an independent t-test for the difference in score between those who had completed education in pain medicine and those who had not. The P-value, test statistic and confidence interval reported is dependent on the assumption of equal / non-equal variance as determined by Levene's test (not reported here)

Table 6. Table of Education in Pain Medicine scores for PABS_PT

N= 232	Education in pain med (n=21) Mean	(SD)	No Education in pain med (n= 211) Mean	(SD)	P-value [2]	t	95% CI		Mean Diff (Abs)	Effect Size [1] (r)
							Lower	Upper		
Dimension 1: Biomechanical Orientation	29.57	10.60	31.61	7.98	.400	-1.082	-6.97	2.89	2.04	.18
Dimension 2: Behavioural Orientation	14.33	4.22	14.00	3.26	.669	.428	-1.19	1.84	.33	.03
Back pain sufferers should refrain from all physical activity in order to avoid injury (PA1)	.81	.87	.89	.91	.711	-.370	-.49	.33	.08	.02
Good posture prevents back pain (PA2)	2.95	1.16	2.87	1.07	.731	.344	-.40	.57	.09	.02
Knowledge of the tissue damage is not necessary for effective therapy (PA3)	1.67	1.46	1.80	1.20	.631	-.481	-.68	.42	.13	.03
Reduction of daily physical exertion is a significant factor in treating back pain (PA4)	1.86	.96	1.99	1.09	.590	-.539	-.62	.35	.13	.04
Not enough effort is made to find the underlying organic causes of back pain (PA5)	2.76	.89	2.70	1.07	.787	.270	-.41	.54	.07	.02
Mental stress can cause back pain even in the absence of tissue damage (PA6)	4.00	1.10	3.74	.94	.241	1.176	-.17	.69	.26	.08
The cause of back pain is unknown (PA7)	1.76	1.48	1.82	1.09	.874	-.207	-.74	.63	.05	.03
Unilateral physical stress is not a cause of back pain (PA8)	2.10	1.41	1.44	.93	.048	2.096	.01	1.31	.66	.41
Patients who have suffered back pain should avoid activities that stress the back (PA9)	2.14	1.24	2.15	1.17	.974	-.033	-.54	.52	.01	.002
Pain is a nociceptive stimulus, indicating tissue damage (PA10)	2.19	1.66	2.48	1.25	.447	-.773	-1.06	.48	.29	.16
A patients suffering from severe back pain will benefit from physical exercise (PA11)	3.19	1.08	2.93	1.09	.294	1.053	-.23	.75	.26	.07
Functional limitations associated with back pain are the result of psychosocial factors (PA12)	2.33	1.28	2.33	.96	.996	.006	-.59	.60	<.01	<.01

The best advice for back pain is: 'Take care' and 'Make no unnecessary movements' (PA13)	.95	.81	1.34	1.09	.054	-2.010	-.78	.01	.38	.36
Patients with back pain should preferably practice only pain free movements (PA14)	1.76	1.14	2.22	1.04	.059	-1.898	-.93	.02	.46	.12
Back pain indicates that there is something dangerously wrong with the back (PA15)	.81	.93	1.14	.97	.134	-1.504	-.77	.10	.33	.10
The way patients view their pain influences the progress of the symptoms (PA16)	4.10	.89	3.87	.95	.303	1.032	-.20	.65	.22	.07
Therapy may have been successful even if pain remains (PA17)	3.48	.87	3.03	.97	.043	2.033	.01	.88	.45	.13
Therapy can completely alleviate the functional symptoms caused by back pain (PA18)	3.48	1.08	2.78	1.22	.013	2.506	.15	1.24	.69	.16
If activities of daily living (eg dressing, cooking, bathing) cause more back pain, this is not dangerous (PA19)	2.57	1.03	2.32	1.10	.321	.995	-.24	.74	.25	.07
Back pain indicates the presence of organic injury (PA20)	1.38	1.16	1.99	1.16	.023	-2.285	-.113	-.08	.61	.15
Sport should not be recommended for patients with back pain (PA21)	1.48	.98	1.75	1.11	.280	-1.082	-.77	.22	.27	.07
If back pain increases in severity, I immediately adjust the intensity of my treatment accordingly (PA22)	3.19	1.17	2.98	1.30	.477	.713	-.37	.79	.21	.05
If therapy does not result in a reduction in back pain, there is a high risk of severe restrictions in the long term (PA23)	2.29	1.19	2.13	1.04	.526	.636	-.32	.63	.15	.04
Pain reduction is a precondition for the restoration of normal functioning (PA24)	2.71	1.42	2.80	1.06	.788	-.345	-.75	.57	.09	.06
Increased pain indicates new tissue damage or the spread of existing damage (PA25)	1.95	1.16	2.05	1.06	.699	-.387	-.58	.39	.10	.03
It is the task of the osteopath to remove the cause of back pain (PA26)	2.57	1.57	2.66	1.28	.770	-.293	-.68	.50	.09	.02
There is no effective treatment to eliminate back pain (PA27)	1.38	1.40	1.38	1.10	.991	-.011	-.51	.51	<.01	<.01
Electrotherapy (eg TENS, ultrasound) and/or back braces support functional recovery (PA28)	2.05	1.07	2.28	1.03	.316	-1.005	-.70	.23	.24	.07
Even if the pain has worsened, the intensity of the next treatment can be increased (PA29)	1.67	.80	1.74	.95	.736	-.338	-.50	.35	.07	.02

If patients complain of pain during exercise, I worry damage is being caused (PA30)	2.33	1.24	2.43	.93	.655	-.448	-.53	.33	.10	.03
The severity of tissue damage determines the level of pain (PA31)	1.48	1.54	1.70	1.19	.423	-.803	-.78	.33	.23	.05

Notes

- Abbreviations: PA1 etc represent the item from the questionnaire; Prac = practitioners; CI = confidence interval; med = medicine; mean diff = Mean difference; Abs = Absolute;
1. Effect sizes were calculated as described by Field³⁶
 2. The P-value reported is from an independent t-test for the difference in score between those with education and those without. The P-value, test statistic and confidence interval reported is dependent on the assumption of equal / non-equal variance as determined by Levene's test (not reported here)

Table 7. Table of Gender scores for HC-PAIRS

N= 242		Male (n=114)		Female (n=128)		P- value [2]	t	95% CI for the mean difference		Mean Diff (Abs)	Effect Size ^[1] (r)
		Mean	SD	Mean	SD			Lower	Upper		
	HC-PAIRS total	45.11	9.09	44.44	8.07	.545	.606	-1.51	2.84	.67	.04
	Dimension 1: Functional Expectations	25.57	6.33	24.87	6.11	.381	.879	-.87	2.28	.70	.06
	Dimension 2: Social Expectations	11.13	3.17	11.26	2.78	.742	-.330	-.88	.63	-.13	.02
	Dimension 3: Need for Cure	8.25	3.37	8.20	2.96	.900	.126	-.75	.85	.05	.01
	Dimension 4: Projected Cognition	8.54	1.81	8.55	1.81	.990	-.013	-.46	.46	<.01	<.01
	Chronic pain patients can still be expected to fulfil work and family responsibilities despite pain (HC1)	3.46	1.48	3.05	1.48	.029	2.193	.04	.79	.42	.14
	An increase in pain is an indicator that a chronic back pain patient should stop what they are doing until the pain decreases (HC2)	3.31	1.51	3.38	1.53	.729	-.347	-.45	.32	-.07	.02
	Chronic back pain patients cannot go about normal life activities when they are in pain (HC3)	2.85	1.66	2.80	1.54	.793	.263	-.35	.46	.05	.02
	If their pain would go away, chronic back pain patients would be every bit as active as they used to be (HC4)	3.15	1.62	3.34	1.50	.353	-.931	-.58	.21	-.19	.06
	Chronic back pain patients should have the same benefits as the handicapped because of their chronic pain problem (HC5)	2.57	1.49	2.52	1.45	.805	.247	-.33	.42	.05	.02
	Chronic back pain patients owe it to themselves and those around them to perform their usual activities when their pain is bad (HC6)	2.04	1.36	1.88	1.27	.346	.944	-.17	.49	.16	.06
	Most people expect too much of chronic back pain patients, given their pain (HC7)	3.18	1.24	3.23	1.15	.744	-.327	-.35	.25	-.05	.02
	Chronic back pain patients have to be careful not to do anything that might make their pain worse (HC8)	3.36	1.71	3.27	1.46	.648	.458	-.31	.50	.09	.03
	As long as they are in pain, chronic back pain patients will never be able to live as well as they did before (HC9)	3.28	1.70	3.15	1.57	.530	.629	-.28	.55	.13	.04
	When their pain gets worse, chronic back pain patients find it very hard to concentrate on anything else (HC10)	4.30	1.11	4.34	.97	.733	-.342	-.31	.22	-.05	.02

Chronic back pain patients have to accept that they are disabled because of their chronic pain (HC11)	1.93	1.29	2.05	1.40	.473	-.719	-.47	.22	-.13	.05
There is no way that chronic back pain patients can return to doing the things they used to do unless they find a cure for their pain (HC12)	2.16	1.51	2.07	1.41	.641	.467	-.28	.46	.09	.03
Chronic back pain patients find themselves frequently thinking about their pain and what it has done to their life (HC13)	4.25	1.06	4.20	8.07	.768	.295	-.24	.33	.04	.02
Even though their pain is always there, chronic back pain patients often don't notice it at all when they are keeping themselves busy (HC14)	3.45	1.20	3.45	6.11	.989	.013	-.30	.30	<.01	<.01
All of chronic back pain patient's problems would be solved if their pain would go away (HC15)	1.82	1.70	1.72	2.78	.597	.530	-.29	.50	.11	.04

Notes

Abbreviations: HC1 etc represent the item from the questionnaire; Prac = practitioners; CI = confidence interval; Mean Diff = Mean Difference; Abs = Absolute;

1. Effect sizes were calculated as described by Field³⁶

2. The P-value reported is from an independent t-test for the difference in score between males and females. The P-value, test statistic and confidence interval reported is dependent on the assumption of equal / non-equal variance as determined by Levene's test (not reported here).

Table 8. Table of Gender scores for PABS_PT

N = 232	Male (n=114)		Female (n=128)		P-value [2]	t	95% CI for the mean difference		Mean Diff (Abs)	Effect Size[1] (r)
	Mean	SD	Mean	SD			Lower	Upper		
Dimension 1: Biomechanical Orientation	31.05	8.53	31.76	8.00	.515	-.652	-2.85	1.43	.71	.04
Dimension 2: Behavioural Orientation	13.62	3.65	14.41	3.03	.075	-1.788	-1.67	.08	.79	.12
Back pain sufferers should refrain from all physical activity in order to avoid injury (PA1)	.93	.97	.84	.84	.440	.767	-.14	.33	.09	.05
Good posture prevents back pain (PA2)	2.83	1.12	2.92	1.05	.524	-.638	-.37	.19	.09	.04
Knowledge of the tissue damage is not necessary for effective therapy (PA3)	1.79	1.28	1.79	1.17	.980	.025	-.31	.32	<.01	<.01
Reduction of daily physical exertion is a significant factor in treating back pain (PA4)	2.05	1.18	1.92	.98	.375	.889	-.16	.41	.13	.06
Not enough effort is made to find the underlying organic causes of back pain (PA5)	2.58	1.14	2.81	.96	.101	-1.649	-.50	.05	.23	.11
Mental stress can cause back pain even in the absence of tissue damage (PA6)	3.70	1.05	3.83	.86	.313	-1.011	-.38	.12	.13	.07
The cause of back pain is unknown (PA7)	1.68	1.21	1.93	1.03	.101	-1.647	-.54	.05	.24	.11
Unilateral physical stress is not a cause of back pain (PA8)	1.62	1.16	1.39	.82	.081	1.753	-.03	.50	.23	.12
Patients who have suffered back pain should avoid activities that stress the back (PA9)	2.03	1.25	2.26	1.10	.128	-1.529	-.54	.07	.24	.10
Pain is a nociceptive stimulus, indicating tissue damage (PA10)	2.27	1.39	2.61	1.17	.043	-2.033	-.67	-.01	.34	.13
A patients suffering from severe back pain will benefit from physical exercise (PA11)	2.87	1.19	3.02	.98	.293	-1.053	-.44	.13	.15	.07
Functional limitations associated with back pain are the result of psychosocial	2.18	1.05	2.47	.92	.028	-2.206	-.54	-.03	.29	.14

factors (PA12)										
The best advice for back pain is: 'Take care' and 'Make no unnecessary movements' (PA13)	1.32	1.08	1.29	1.07	.825	.221	-.25	.31	.03	.01
Patients with back pain should preferably practice only pain free movements (PA14)	2.11	1.14	2.24	.98	.356	-.926	-.40	.15	.13	.06
Back pain indicates that there is something dangerously wrong with the back (PA15)	1.15	1.10	1.08	.84	.624	.491	-.19	.32	.06	.03
The way patients view their pain influences the progress of the symptoms (PA16)	3.83	.91	3.95	.98	.321	-.994	-.37	.12	.12	.07
Therapy may have been successful even if pain remains (PA17)	3.08	1.00	3.06	.95	.848	.191	-.23	.28	.02	.01
Therapy can completely alleviate the functional symptoms caused by back pain (PA18)	2.82	1.32	2.87	1.14	.756	-.312	-.37	.27	.05	.02
If activities of daily living (eg dressing, cooking, bathing) cause more back pain, this is not dangerous (PA19)	2.34	1.19	2.35	1.00	.912	-.111	-.30	.27	.02	<.01
Back pain indicates the presence of organic injury (PA20)	1.88	1.26	1.98	1.08	.547	-.604	-.40	.21	.09	.04
Sport should not be recommended for patients with back pain (PA21)	1.71	1.14	1.74	1.07	.844	-.197	-.32	.26	.03	.01
If back pain increases in severity, I immediately adjust the intensity of my treatment accordingly (PA22)	2.87	1.26	3.11	1.29	.152	-1.439	-.57	.09	.24	.10
If therapy does not result in a reduction in back pain, there is a high risk of severe restrictions in the long term (PA23)	2.27	1.12	2.03	.97	.085	1.731	-.03	.51	.24	.12
Pain reduction is a precondition for the restoration of normal functioning (PA24)	2.76	1.16	2.82	1.05	.699	-.388	-.34	.23	.06	.03
Increased pain indicates new tissue damage or the spread of existing damage (PA25)	1.93	1.06	2.14	1.07	.132	-1.511	-.49	.06	.21	.10
It is the task of the osteopath to remove the cause of back pain (PA26)	2.76	1.43	2.55	1.17	.215	1.242	-.13	.56	.21	.09
There is no effective treatment to eliminate back pain (PA27)	1.39	1.20	1.38	1.07	.926	.093	-.28	.31	.01	.01

Electrotherapy (eg TENS, ultrasound) and/or back braces support functional recovery (PA28)	2.10	1.09	2.41	.95	.023	-2.310	-.57	-.05	.31	.15
Even if the pain has worsened, the intensity of the next treatment can be increased (PA29)	1.86	.93	1.61	.93	.043	2.031	.01	.49	.25	.13
If patients complain of pain during exercise, I worry damage is being caused (PA30)	2.43	1.05	2.42	.86	.942	.073	-.24	.26	.01	.01
The severity of tissue damage determines the level of pain (PA31)	1.79	1.34	1.58	1.11	.200	1.287	-.11	.53	.21	.09

Notes

Abbreviations: PA1 etc represent the item from the questionnaire; Prac = practitioners; CI = confidence interval; Mean Diff = Mean differences; Abs = Absolute;

1. Effect sizes were calculated as described by Field³⁶
2. The P-value reported is from an independent t-test for the difference in score between Practitioners and Students. The P-value, test statistic and confidence interval reported is dependent on the assumption of equal / non-equal variance as determined by Levene's test (not reported here)

Table 9. Comparison of HC-PAIRS total scores and dimension scores for the New Zealand practitioners and students of Osteopathy, Australian Physiotherapy students, Brazilian Physiotherapy students, and North American Community healthcare providers and functional restoration providers

	New Zealand Osteopathic Practitioners n= 162	New Zealand Osteopathic Students n= 80	Nth American Healthcare providers n= 144	Nth American functional restoration providers n= 66	Australian Physiotherapy Students n= 618	Brazilian Physiotherapy Students n= 153
HC-PAIRS total	44.4 \pm 8.9	45.4 \pm 7.7	37.0 \pm 10.0**	23.0 \pm 7.0**	38.3 \pm 9.2**	51.4 \pm 8.5**
Dimension_1 'Functional Expectations'	25.2 \pm 6.5	25.3 \pm 5.7	19.0 \pm 8.0**	8.0 \pm 5.0**	20.7 \pm 7.1**	30.3 \pm 5.9**
Dimension_2 'Social Expectations'	11.1 \pm 3.1	11.4 \pm 2.6	8.0 \pm 8.0**	4.0 \pm 2.0**	8.4 \pm 3.1**	9.9 \pm 3.3**
Dimension_3 'Need for Cure'	8.1 \pm 3.3	8.6 \pm 2.9	6.0 \pm 3.0**	4.0 \pm 3.0**	7.3 \pm 3.2**	10.2 \pm 3.6**
Dimension_4 'Projected Cognition'	8.6 \pm 1.7	8.4 \pm 2.0	10.0 \pm 1.0**	10.0 \pm 2.0**	8.4 \pm 1.9**	9.4 \pm 1.7**

Notes

All values are mean \pm SD

** Scores were scaled to adjust for the 0-6 Likert scale in the current study compared to the previous 1-7 stage Likert scales of previous studies. Each answer was therefore one unit less than the previous studies, with a total score being fifteen units less.

Data from Rainville et al² and Ferriera et al²⁰

Table 10. Comparison between NZ male and female osteopaths (including students) and male and female Dutch physiotherapists for PABS_PT mean total scores for the biomechanical dimension and behavioural dimension.

	NZ Males n= 114	NZ Females n= 128	Netherlands Males n= 255	Netherlands Females n= 147
Biomechanical Orientation	31.1 ± 8.5	31.8 ± 8.0	25.7 ± 10.8**	27.2 ± 10.0**
Behavioural Orientation	13.6 ± 3.7	14.4 ± 3.0	13.5 ± 4.6**	14.7 ± 3.8**

Notes

All values are mean ± SD

** Scores were scaled to adjust for the 0-5 Likert scale in the current study compared to the previous 1-6 stage Likert scales of previous studies. Each answer was therefore one unit less than the previous studies. The biomechanical dimension has 14 items; above results are 14 units less than reported in original study. Behavioural dimension has 6 items; above results are 6 units less than reported in original study

Netherlands data from Ostelo et al.³⁴

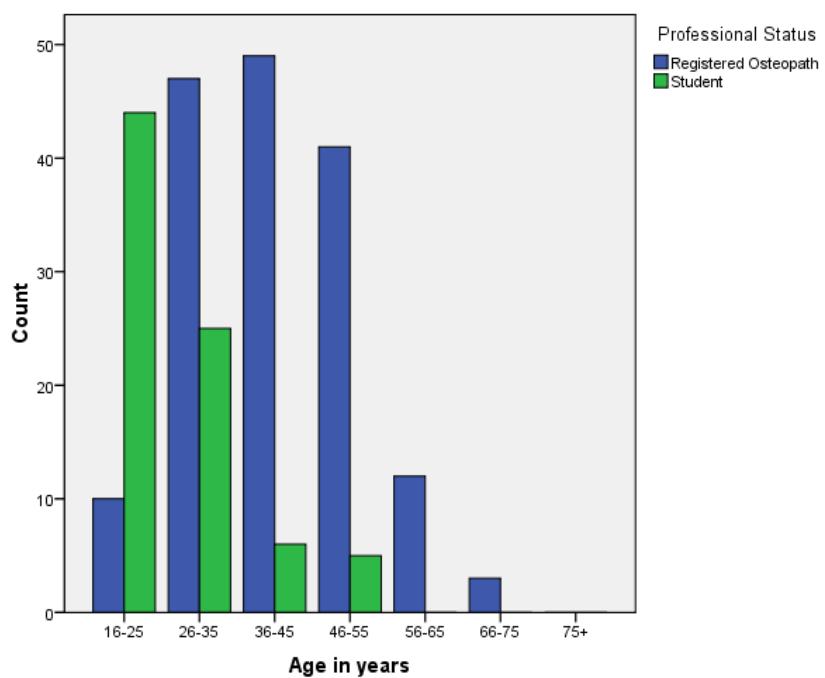


Figure 1. Frequency of the ages of osteopathic practitioners and students

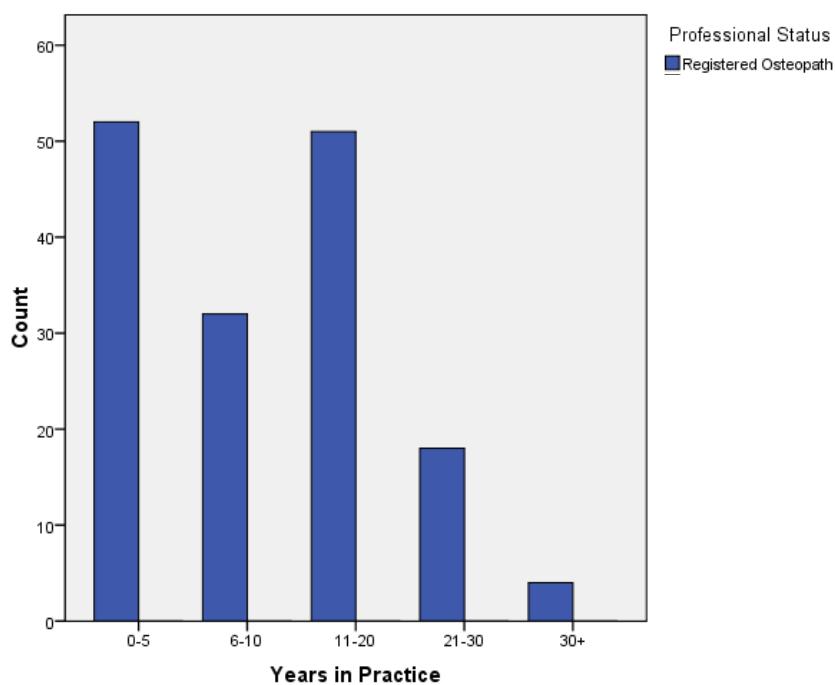


Figure 2. Frequency of practitioner years in practice

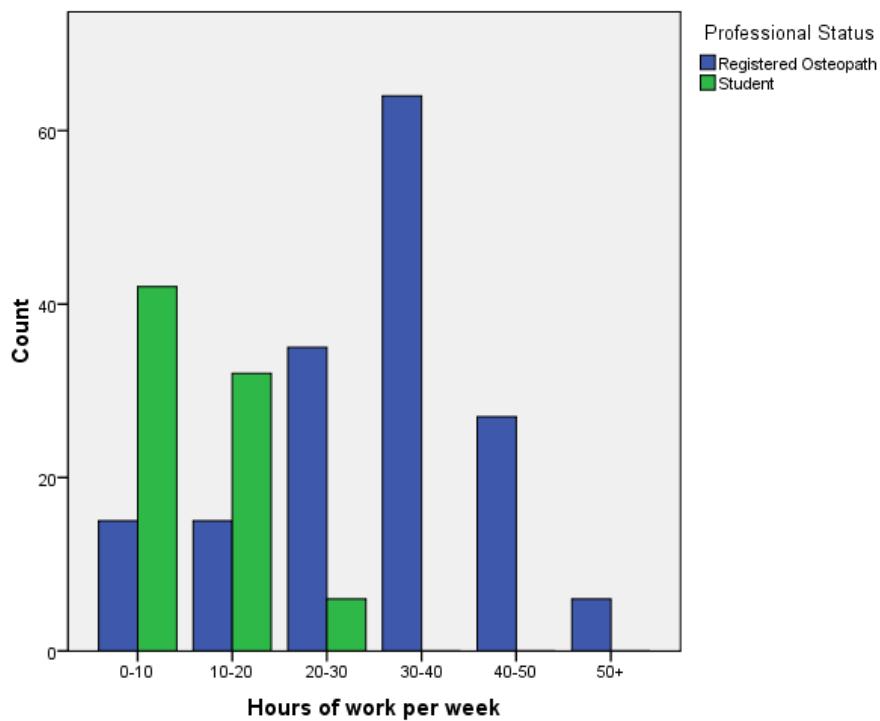


Figure 3. Frequency of Practitioner and Students hours of work (per week)

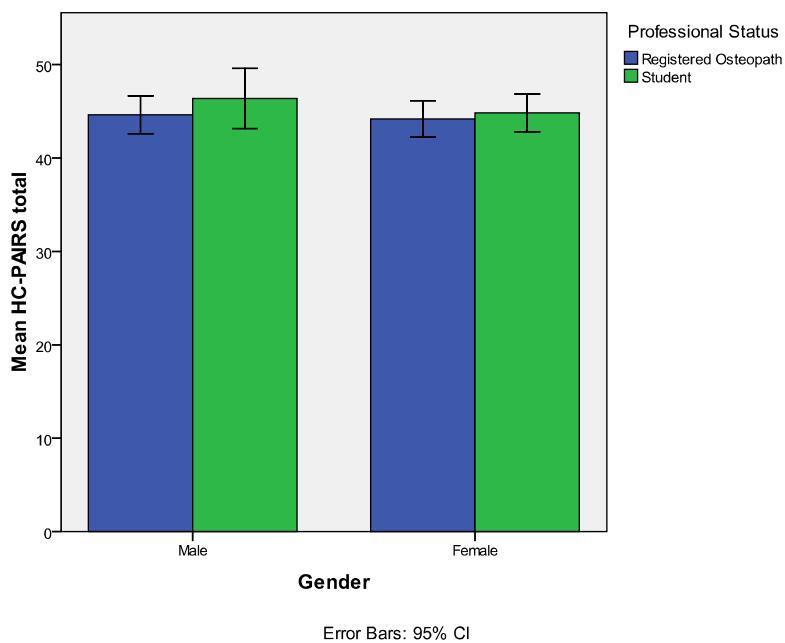


Figure 4. Histogram showing the differences between gender and professional status on Mean HC-PAIRS total scores

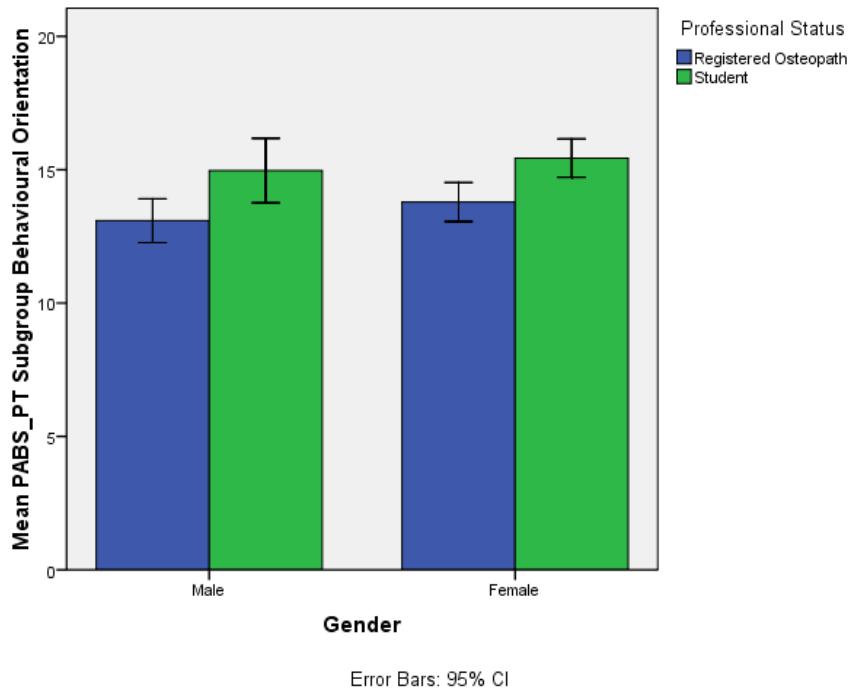


Figure 5. Histogram showing the differences between gender and professional status on mean PABS_PT behavioural dimension total scores

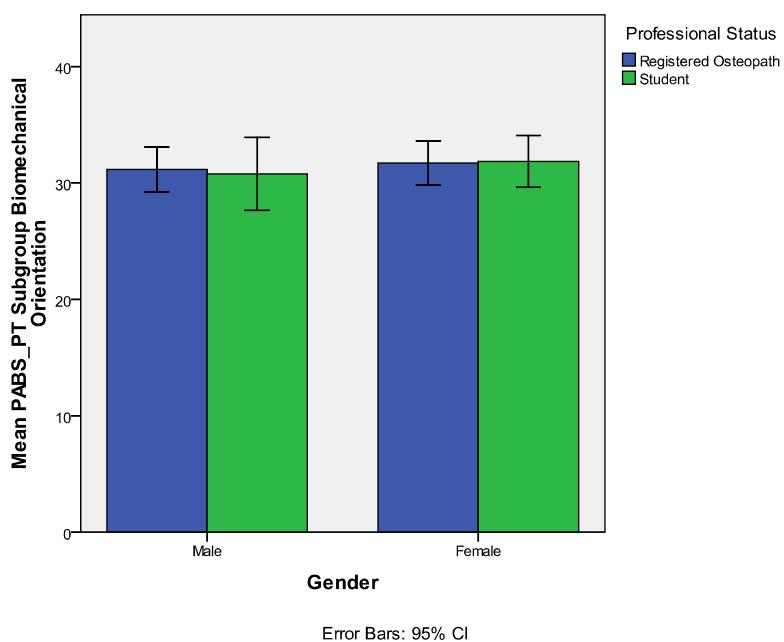


Figure 6. Histogram showing the differences between gender and professional status on mean PABS_PT Biomechanical dimension total scores

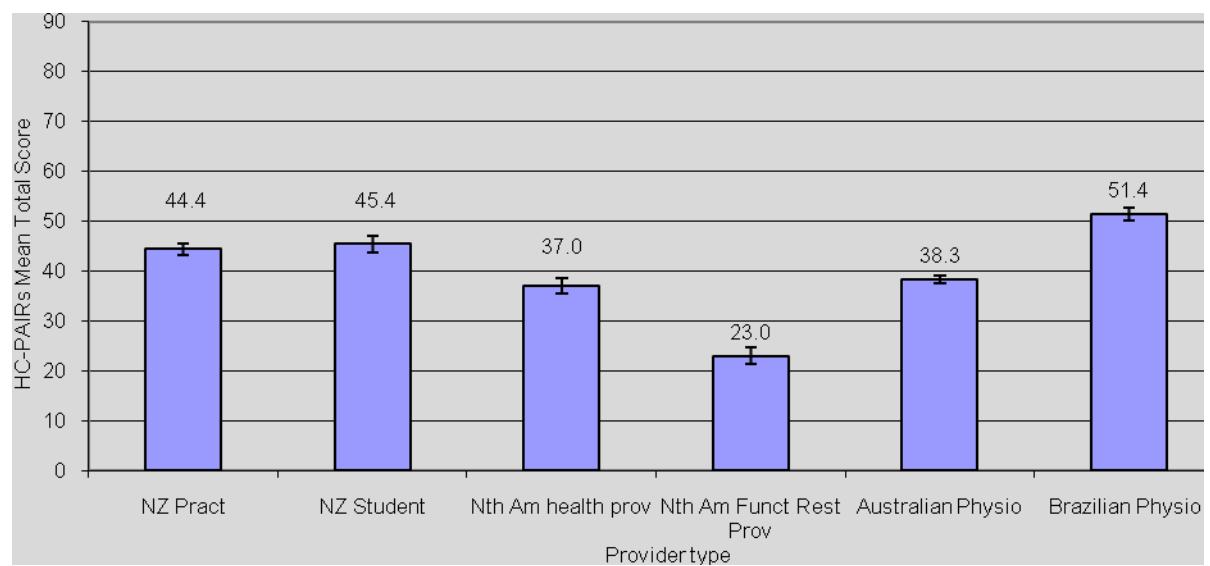


Figure 7. Histogram plot of HC-PAIRS mean total score for New Zealand Osteopathic practitioners and students, Brazilian and Australian Students, and American community healthcare providers and functional restoration providers. Values are mean $\pm 95\%$ CI.

Data from Rainville et al² and Ferriera et al²⁰

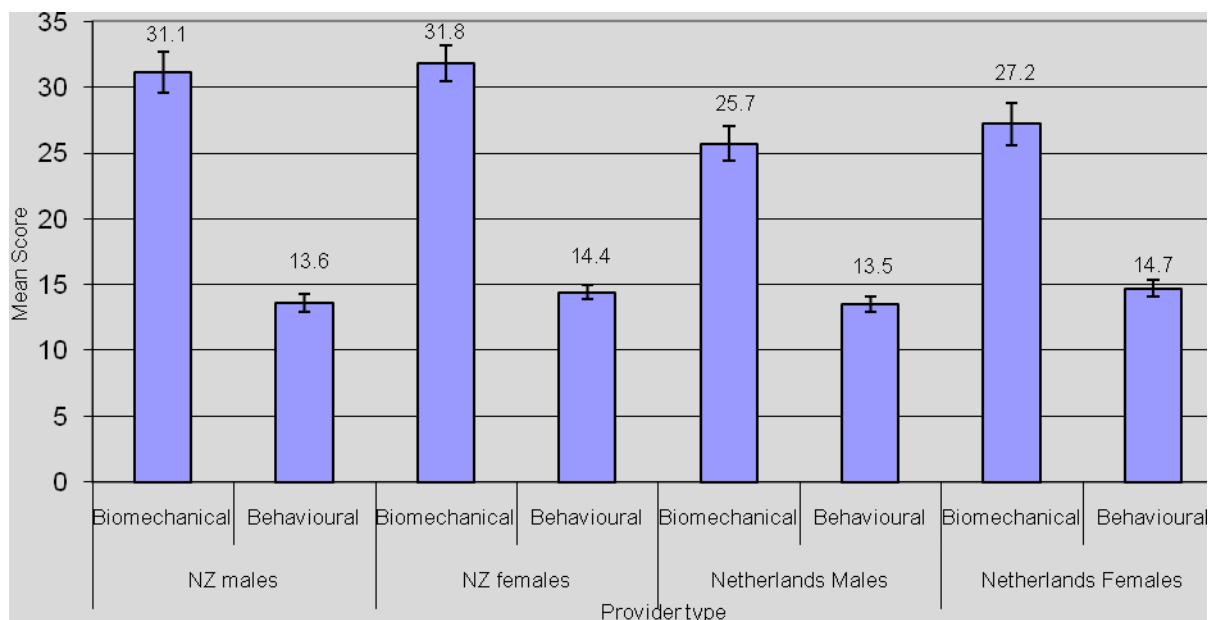


Figure 8. Histogram plot of PABS_PT mean total scores for biomechanical and behavioural dimensions between male and female NZ osteopaths and male and female physiotherapists. Values are mean $\pm 95\%$ CI

Netherlands data from Ostelo et al³⁴

Section 3: Appendices

Appendix A: Participant information sheet

Participant information sheet. Osteopathic attitudes and beliefs of chronic pain.

Dear participant,

Hello, my name is Abby Carrington. I am a fifth year osteopathic student at Unitec, undertaking my research dissertation as part of my Masters of Osteopathy. Along with my supervisors, Rob Moran and Clive Standen, I would like to invite you to participate in the study that is investigating “the osteopathic beliefs and attitudes associated with chronic pain”. The purpose if this study is to establish the attitudes and beliefs about chronic pain among registered osteopaths and students of osteopathy in New Zealand.

Pain is the most common symptomatic reason to seek medical consultation. Practitioner and Patient’s Beliefs and attitudes about pain can potentially affect the outcome of treatment and management of patients with pain.

Various factors have been proposed as possible affecters of the beliefs and attitudes towards pain, including education, cultures and profession.

With the limited literature on osteopathic research, the purpose of this investigation is to discover themes related to attitudes and beliefs about chronic pain. A further search will aim to establish whether factors such as further medical education or clinical experience can alter these perspectives, further adding to the research in the field of osteopathy in New Zealand.

A sample of osteopaths and osteopathic students will be sent two questionnaires, similar in design, attempting to gather ‘YOUR VIEWS’ on chronic pain. There are no right or wrong answers. The first questionnaire has a total of 15 questions, with the second, 31 questions. Both have a similar grading scheme and should take no more than ten minutes to complete. We ask that you carefully consider each question and answer. Remember, this is not a test!

Distribution to all students will occur on five separate occasions (for each year) and will be distributed by an independent third party. A second distribution will occur to allow for follow-up of non-responders. There will be mail-outs of questionnaires to the registered osteopaths- with prepaid envelopes supplied. A second mail-out is forecast for non-responders.

All questionnaires are anonymous, so **participants are asked not to identify themselves**. Return of questionnaires is taken as IMPLIED CONSENT for participation in the study. In the end, it is up to you whether you decide to participate.

Please remember this is no assessing your knowledge. There are no anticipated risks involved in this study as we are asking for your views and opinions. However, if you do have questions about the study do not hesitate to contact any of the investigators below:

Contacts:

Abby Carrington Unitec, New Zealand (09)8183395 0274390824 abby.carrington@gmail.com	Rob Moran Unitec, New Zealand (09)8154321 ext: 8642	Clive Standen Unitec, New Zealand (09)8154321 ext:
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UREC REGISTRATION NUMBER: (683.2007)

This study has been approved by the UNITEC Research Ethics Committee from 21 February 2007 to 31 December 2009. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (Tel: + 64 9 815-4321 ext 7248 or by email ethics@unitec.ac.nz). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix B: Complete questionnaires

Osteopath's attitudes and beliefs of chronic pain.

Questionnaires about chronic low back pain

Thank you for agreeing to participate in this project. The purpose of these surveys is to help us analyse how you, as an osteopath/osteopathic student, approach the most common forms of chronic back pain. For the osteopathic practitioners when we state 'back pain' we do not mean back pain resulting from a 'radicular' or 'nerve root syndrome', cauda equina syndrome, fractures, infections, inflammatory disease, a tumor or metastasis.

We are looking for *your* opinion and the way that you do work in practice; not the opinions of others or the way you might think you should practice. These scales do not require you to have had clinical experiences with patients or specific knowledge about pain science.

Please answer ALL of the questions by marking the relevant options within the demographics sheet, and with the other scales, the answer that best represents your view on chronic pain.

Section 1: Demographic details-

Just a little bit about you

- 1) Institution where you gained your qualification (If you are a practitioner- If you are pre-qualified, please indicate your current institution).

- British School of Osteopathy, United Kingdom
- British College of Naturopathy and Osteopathy, United Kingdom
- British College of Osteopathic Medicine, United Kingdom
- College of Osteopaths, United Kingdom
- European School of Osteopathy
- International College of Osteopathy, Australia
- London College of Osteopathic Medicine, United Kingdom
- London School of Osteopathy, United Kingdom
- Osteopathic College of New Zealand, New Zealand
- Oxford Brookes University, United Kingdom
- Phillip Institute of Technology, Australia (pre 1993)
- Royal Melbourne Institute of Technology (RMIT), Australia
- South Pacific College of Naturopathy and Osteopathy, New Zealand
- Surrey Institute of Osteopathic Medicine, United Kingdom
- Sydney College of Osteopathy, Australia
- UNITEC New Zealand, New Zealand
- University of Western Sydney, Australia
- Victoria University, Australia
- Windsor College, Australia
- Other (please specify): _____

- 2) Gender

- Male
- Female

- 3) Age (In years):_____
- 4) Professional Status
 - Practitioner
 - Student
- 5) If you are a student, what year of your degree are you currently in:_____
- 6) If you are a registered practitioner, how many years have you been practicing:_____
- 7) Highest level of Education in ANY area of study
 - Diploma
 - Bachelor's Degree
 - Honours Degree
 - Masters Degree
 - PhD or Doctoral Degree
 - Other (name):_____
- 8) Have you had any post graduate education in pain medicine
 - No
 - Yes,
If yes, what course did you do and where?_____
- 9) Average working week (Hours)- (Students- this question relates to hours in student clinic, practical class and associated clinical practice time; Practitioners, this question relates to your hours in your Osteopathic clinic):_____
- 10) In what kind of area is/are your practice(s) located?
 - Rural or community
 - Village
 - Provincial town (outside a main centre)
 - City (suburbs close to central business district)
 - Inner city (central business district)
 - City Suburban
 - Other (name):_____

Section 2: Questionnaires

Questionnaire 1: HC-PAIRS scale:

Please respond to each statement by circling the response that best represents your view.
Please answer all questions

		Totally Disagree	Largely Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Largely agree	Totally Agree
1	Chronic pain patients can still be expected to fulfil work and family responsibilities despite pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
2	An increase in pain is an indicator that a chronic back pain patient should stop what they are doing until the pain decreases	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
3	Chronic back pain patients cannot go about normal life activities when they are in pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
4	If their pain would go away, chronic back pain patients would be every bit as active as they used to be	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
5	Chronic back pain patients should have the same benefits as the handicapped because of their chronic pain problem	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
6	Chronic back pain patients owe it to themselves and those around them to perform their usual activities when their pain is bad	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
7	Most people expect too much of chronic back pain patients, given their pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
8	Chronic back pain patients have to be careful not to do anything that might make their pain worse	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
9	As long as they are in pain, chronic back pain patients will never be able to live as well as they did before	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
10	When their pain gets	1	2	3	4	5	6	7

	worse, chronic back pain patients find it very hard to concentrate on anything else	<input type="checkbox"/>						
11	Chronic back pain patients have to accept that they are disabled because of their chronic pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
12	There is no way that chronic back pain patients can return to doing the things they used to do unless they find a cure for their pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
13	Chronic back pain patients find themselves frequently thinking about their pain and what it has done to their life	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
14	Even though their pain is always there, chronic back pain patients often don't notice it at all when they are keeping themselves busy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
15	All of chronic back pain patient's problems would be solved if their pain would go away	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

Questionnaire 2: PABS_PT

This questionnaire is much the same as the previous. Again, there are no right or wrong answers. Please respond to each statement by circling the response that best represents your view. Please answer all questions

		Totally disagree	Largely disagree	Disagree somewhat extent	Agree somewhat	Largely agree	Totally agree
1	Back pain sufferers should refrain from all physical activity in order to avoid injury	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
2	Good posture prevents back pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
3	Knowledge of the tissue damage is not necessary for effective therapy	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
4	Reduction of daily physical exertion is a significant factor in treating back pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
5	Not enough effort is made to find the underlying organic causes of back pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
6	Mental stress can cause back pain even in the absence of tissue damage	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
7	The cause of back pain is unknown	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
8	Unilateral physical stress is not a cause of back pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
9	Patients who have suffered back pain should avoid activities that stress the back	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
10	Pain is a nociceptive stimulus, indicating tissue damage	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>

11	A patients suffering from severe back pain will benefit from physical exercise	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
12	Functional limitations associated with back pain are the result of psychosocial factors	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
13	The best advice for back pain is: 'Take care' and 'Make no unnecessary movements'	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
14	Patients with back pain should preferably practice only pain free movements	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
15	Back pain indicates that there is something dangerously wrong with the back	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
16	The way patients view their pain influences the progress of the symptoms	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
17	Therapy may have been successful even if pain remains	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
18	Therapy can completely alleviate the functional symptoms caused by back pain	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
19	If activities of daily living (eg dressing, cooking, bathing) cause more back pain, this is not dangerous	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
20	Back pain indicates the presence of organic injury	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
21	Sport should not be recommended for patients with back pain	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
22	If back pain increases in severity, I immediately adjust the intensity of my treatment accordingly	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

23	If therapy does not result in a reduction in back pain, there is a high risk of severe restrictions in the long term	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
24	Pain reduction is a precondition for the restoration of normal functioning	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
25	Increased pain indicates new tissue damage or the spread of existing damage	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
26	It is the task of the osteopath to remove the cause of back pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
27	There is no effective treatment to eliminate back pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
28	Electrotherapy (eg TENS, ultrasound) and/or back braces support functional recovery	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
29	Even if the pain has worsened, the intensity of the next treatment can be increased	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
30	If patients complain of pain during exercise, I worry damage is being caused	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
31	The severity of tissue damage determines the level of pain	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>

Your voluntary contribution is appreciated. By participating in research such as this, you are assisting in extending the literature base and investing in the future of Osteopathy.

Results of this research will be made available following full completion of my research project. Emails will be sent out with the necessary links attached. If you prefer a hardcopy to be mailed to you, please dont hesitate to contact me.

Kind Regards,
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Appendix C: Ethics Approval for this Project



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Abby Carrington
68 Glengarry Road
Glen Eden
Auckland 0602

17 March 2009

Dear Abby

Your file number for this application: 2008.683

Title: Osteopathic attitudes and beliefs about chronic pain

This is to confirm that your application for ethics approval was reviewed by the Unitec Research Ethics Committee (UREC) and was **approved** on 27 June 2007.

Yours sincerely

A handwritten signature in black ink, appearing to read "Deborah Rolland".

Deborah Rolland
Deputy Chair, UREC