

Exploration of the Osteoarthritis Health, Illness and  
Treatment Beliefs of New Zealanders with Hip  
and/or Knee Osteoarthritis and the Clinicians Who  
Treat the Condition

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## Abstract

Osteoarthritis is a chronic musculoskeletal condition that commonly affects physical, social and mental well-being. Adherence to conservative treatments for hip and knee joint osteoarthritis is poor and known to be affected by health, illness and treatment beliefs of people with the condition and the beliefs of the clinicians who treat these people. Despite this knowledge, few studies have explored and compared the osteoarthritis health, illness and treatment beliefs of people with the condition and clinicians, and no known research to date has explored this in the New Zealand healthcare context. Therefore, one aim of this thesis was to identify, compare and contrast the osteoarthritis beliefs held by New Zealanders living with hip and/or knee osteoarthritis and the beliefs of the clinicians who treat people with this condition. The other aim of the thesis was to identify if people's and clinicians' osteoarthritis beliefs could be measured by existing questionnaires that are grounded in theoretical health, illness and treatment belief models.

The research component of this thesis consisted of two strands, both of which followed an exploratory, sequential mixed-methods design. The first explored the beliefs of people with osteoarthritis, and the second explored clinicians' beliefs. Each strand followed the same format and consisted of three studies; a qualitative descriptive study, a systematic literature review, and a cross-sectional survey.

Twelve people with hip and/or knee osteoarthritis were recruited to the study of people's osteoarthritis health, illness and treatment beliefs. Thematic analysis of the data identified four themes that were called: (i) *Knowing the cause but not the consequence*; (ii) *Explaining treatment beliefs*; (iii) *Understanding the importance of clear collaborative care*; and (iv) *Meaning more than just the joint*. Comparison of these themes with existing models of health, illness and treatment beliefs indicated that the themes had notable overlap with many of the constructs contained within the Common Sense Model (CSM). A systematic literature review identified 17 potential questionnaires. Only the Illness Perception Questionnaire - Revised (IPQ-R) and the Knee Osteoarthritis Fears and Beliefs Questionnaire (KOFBeQ) met the criteria for inclusion in the survey. Items of the KOFBeQ were modified so that the measure was appropriate for people with knee and hip osteoarthritis. One hundred and ninety-eight people with hip and/or knee osteoarthritis completed the survey. The results of this study suggest the IPQ-R and the adapted KOFBeQ have the potential to be valid and



reliable measures of osteoarthritis health, illness and treatment beliefs for people with hip and/or knee osteoarthritis, but limitations with both questionnaires were identified.

Eleven clinicians (2 general practitioners, 2 orthopaedic surgeons, 5 physiotherapists, 1 rheumatologist, and 1 sports physician) were recruited to the qualitative descriptive study of clinicians' osteoarthritis health, illness and treatment beliefs. Thematic analysis of the data identified four themes that were called: (i) *Matching each patient's signs and symptoms*; (ii) *Anticipating what patients think*; (iii) *Enabling patients to understand their osteoarthritis and find their treatment path*; and (iv) *Understanding that treatment only works when everyone is engaged*. Comparison of these themes with existing models of clinicians' health, illness and treatment beliefs and clinical practice approaches, revealed some similarities with the Biomedical and Biopsychosocial Models. A second systematic literature review identified 11 potential questionnaires, but only the Pain and Attitudes Beliefs Scale for Physiotherapists (PABS-PT) questionnaire met the criteria for inclusion in the survey. The PABS-PT did not explore all of the themes identified in the qualitative study of clinicians' beliefs. Therefore, a further search of the literature identified a clinical vignette about a person living with moderate knee osteoarthritis. Additionally, the KOFBeQ was adapted for use with the clinicians, and both measures were included in the survey. Two hundred and ninety-five clinicians (87 general practitioners and 208 physiotherapists) took part in the survey. The findings highlighted considerable limitations in the PABS-PT questionnaire and some limitations with the Clinicians' KOFBeQ. The osteoarthritis health, illness and treatment beliefs of clinicians appeared similar to best practice guidelines, but some of the results indicated limitations in current osteoarthritis clinical services.

Three conclusions emerged from the research component of this thesis. First, people with hip and/or knee osteoarthritis and clinicians who manage the condition hold similar and conflicting beliefs about the disease. Second, the current questionnaires used to measure the osteoarthritis health, illness and treatment beliefs of people with hip and/or knee osteoarthritis and clinicians who treat the condition are limited. Third, the health, illness and treatment beliefs of both people with hip and/or knee osteoarthritis and clinicians who treat the condition were not fully explained by existing health, illness and treatment beliefs models. A shared model of osteoarthritis beliefs was proposed as a theoretical framework that has the potential to overcome the limitations of existing osteoarthritis health, illness and beliefs models and improve clinical services for people living with the condition.

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## Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of another degree or diploma of a university or other institution of higher learning.

Signed:

A handwritten signature in black ink, consisting of a stylized 'S' followed by a horizontal line.

Date: 12<sup>th</sup> October, 2017.

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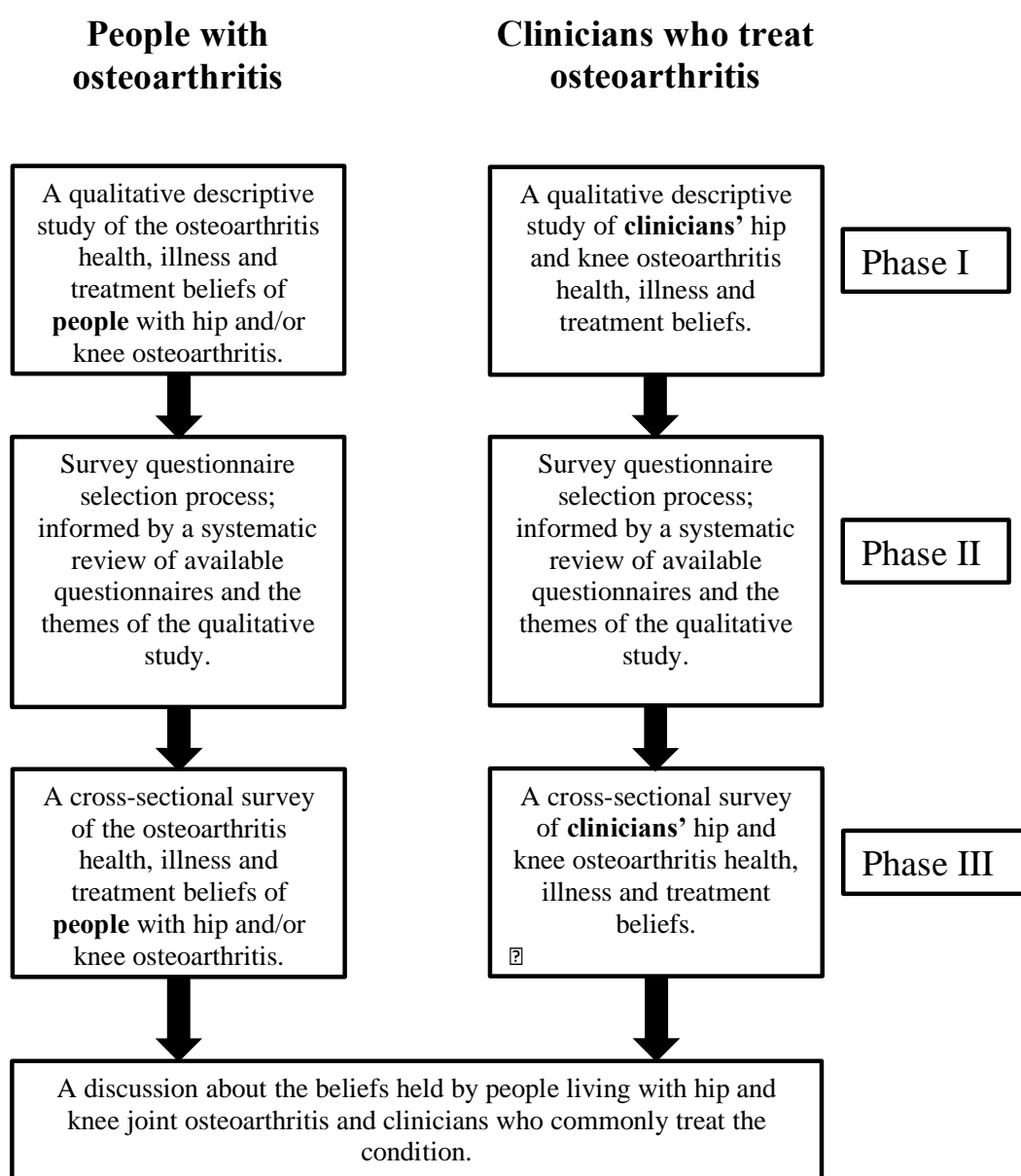
Most importantly, I want to thank my wife, Louise. The years it has taken to complete this thesis constitute a large part of our life together. In this time, we have expanded our family, bought, sold and renovated houses, started and run a very successful company (well, you have). It is cliché to say that this thesis is as much yours as it is mine, but given how we choose to live our lives you know this is true. I look forward to being more ‘present’ at home and to us getting to move on to new adventures.

## Thesis aims and organisation

People's beliefs about illness and disease can influence how they approach treatment. Furthermore, clinicians' beliefs are known to affect how they practise. Therefore, one aim of this thesis was to explore the osteoarthritis health, illness and treatment beliefs of New Zealanders with hip and/or knee osteoarthritis and the clinicians who treat the condition. The other aim of the thesis was to identify if people's and clinicians' osteoarthritis beliefs could be measured by existing questionnaires that are grounded in theoretical health, illness and treatment belief models.

The structure of the thesis reflects the methods used to conduct the six studies making up this research. The research was completed in two strands. The first strand was a mixed-method exploratory sequential investigation of the treatment beliefs of people living with hip and/or knee osteoarthritis in New Zealand. The second strand used the same methods but explored the treatment beliefs held by New Zealand clinicians who work with people with osteoarthritis. Each strand of the research consisted of three phases or studies; a qualitative descriptive observational study, a systematic review, and a cross-sectional observational study (*Figure 1*).

Chapter 1 introduces the problem of hip and knee joint osteoarthritis in New Zealand and presents the seven research questions. Chapter 2 is an overview of the anatomy, aetiology, pathology, signs and symptoms, clinical assessment, and treatment of hip and knee joint osteoarthritis. Chapter 3 provides a review of literature relevant to people's beliefs about the treatment of hip and knee joint osteoarthritis. Chapter 4 provides a review of literature relevant to clinicians' beliefs about the treatment of hip and knee joint osteoarthritis. Chapter 5 is a summary and justification of the methods used in the thesis. Chapters 6 through 11 present each of the six studies conducted as part of the research. Presented first are the three studies associated with people's beliefs about the treatment of hip and/or knee osteoarthritis (Chapters 6, 7 and 8). Following these chapters are the three studies associated with clinicians' beliefs about the treatment of hip and/or knee osteoarthritis (Chapters 9, 10 and 11). Chapter 12 is a discussion of the key findings, recommendations for future research and conclusions drawn from this research.



**Figure 1.** Organisation of the six studies contained within the research.

# Chapter 1 Introduction

## 1.1 The problem

Osteoarthritis is the most common form of arthritis and typically affects the joints of the knees, hips, spine, and hands (Hochberg, Silman, Smolen, Weinblatt, & Weisman, 2015; Palazzo, Nguyen, Lefevre-Colau, Rannou, & Poiraudau, 2016). Hip and knee joint osteoarthritis are ranked as the 11<sup>th</sup> highest contributor to global disability (Cross et al., 2014). Despite this, some prominent researchers argue that most people in Western countries with hip and knee osteoarthritis receive substandard care (Hunter, 2011, 2017; Hunter & Lo, 2009; Hunter, Neogi, & Hochberg, 2011). Approximately 387,000 people, or 10.7% of the population of New Zealand, live with osteoarthritis (Ministry of Health, 2015). Furthermore, this figure is expected to rise due to projected increases in the age of the population and the growing obesity rate, factors known to affect the development of osteoarthritis (Cross et al., 2014; Palazzo et al., 2016). People with osteoarthritis often experience pain, joint stiffness, and weakness; which can affect their mobility, function, mental well-being and independence (Hall et al., 2008). The estimated cost of arthritis to the New Zealand health service in 2010 was \$3.2 billion New Zealand dollars, approximately \$100 million of which was spent primarily on joint replacement surgery (Arthritis New Zealand, 2016). However, the total cost of arthritis is thought to be far higher because these figures do not include costs attributed to lost productivity, these expenses are believed to be much greater than those of medical care (Hermans et al., 2012). Additionally, these figures may not account for people who view osteoarthritis as a normal part of ageing and therefore do not choose to seek medical attention (Appelt, Burant, Siminoff, Kwoh, & Ibrahim, 2007; Morden, Jinks, & Ong, 2011).

There is currently no cure for osteoarthritis, and unlike other forms of arthritis, there are no disease-modifying drugs available for the condition. Therefore, the focus of treatment for osteoarthritis is on the maintenance of physical function, symptom reduction and limiting disease progression (Hochberg et al., 2015). Exhausting all conservative treatment options is encouraged before more invasive interventions are employed. Additionally, all interventions used should reflect the wants and values of the individual patient (Hunter & Lo, 2009). Current clinical guidelines recommend the use of treatments such as lifestyle change, weight loss, exercise and manual therapy (non-



pharmacological), prior to considering medication or surgery (Bennell, 2013; Bennell & Hinman, 2011; Dean & Gormsen Hansen, 2012; Fransen et al., 2015; Merashly & Uthman, 2012; Van Manen, Nace, & Mont, 2012; Zhang et al., 2008). The National Institute for Health and Care Excellence (NICE) Osteoarthritis Guidelines (2014) advocate for a staged progressive model of clinical management, which shows a progression from non-pharmacological, to pharmacological, to surgical management of osteoarthritis. However, often non-pharmacological treatments are underutilised (Brand et al., 2014; Hunter, 2011; Hunter & Lo, 2009). Clinicians continue to focus on the provision of pharmaceutical and surgical treatment options, even though these treatment approaches fail to address comorbidities that commonly occur in people with osteoarthritis such as heart disease and diabetes (Hunter & Lo, 2009; Kim et al., 2016; Piva et al., 2015).

Research shows a rapid increase in the number of total joint replacement (TJR) surgeries currently undertaken each year both in New Zealand and internationally (Hooper, Lee, Rothwell, & Frampton, 2014; Leskinen, Eskelinen, Huhtala, Paavolainen, & Remes, 2012; Losina & Katz, 2012). Changes in population age and obesity rates cannot fully explain this growth. The growth is a trend that looks set to continue, with the demand for TJR surgery predicted to increase by nearly seven times between the years 2005 and 2030 in the United States of America (Kurtz, Ong, Lau, Mowat, & Halpern, 2007). This growth in surgery rates is seen elsewhere, with a considerable rise in TJR also observed in Finland (Leskinen et al., 2012). Unexpectedly, the largest increase in TJR surgery has been in people under the age of 59 years, a group previously described as too young for surgery (Leskinen et al., 2012). Leskinen et al. (2012) suggested possible reasons for the change as: (i) people being more informed through media such as internet, (ii) people opting for surgery at earlier stages of their disease, (iii) the increased 'life' of the implant, (iv) improvements in surgical techniques, and (v) surgeons being more competent and willing to complete the procedure.

In contrast to the popularity of surgery, referral of people with hip and knee osteoarthritis to non-pharmaceutical or conservative management programmes is poor (Australian Institute of Health and Welfare, 2010; Chevalier, Marre, de Butler, & Hercek, 2004; Cottrell, Roddy, & Foster, 2010). Additionally, the success of these programmes can be further hindered by low levels of patient engagement and long-term adherence (Pisters et al., 2010; Poitras et al., 2010). Research indicates that the

health beliefs of people with osteoarthritis may affect their treatment choices (Toye, Barlow, Wright, & Lamb, 2006). Therefore, these trends in referral rates, engagement, and adherence to conservative treatment may be a reflection of people's perceptions about treatment efficacy. The poor engagement and adherence may be in part due to people believing that exercises are not helpful and are merely preparatory for surgery, as has been indicated elsewhere (Toye et al., 2006). For many people, past experiences with health care services and the education and advice they receive from health care professionals influence their treatment beliefs (Crum & Zuckerman, 2017; Thompson, 2013). Additionally, research indicates that people's health and illness beliefs can be directly influenced by the health and illness beliefs of the clinicians they interact with (Crum & Zuckerman, 2017; Darlow et al., 2012). In contrast to the known benefits of conservative management, it has been found that some clinicians believe that the conservative management of osteoarthritis is ineffective and too challenging for patients (Conrozier, Marre, Payen-Champenois, & Vignon, 2008; Poitras et al., 2010). Hunter (2011) argues that, for the conservative or non-pharmaceutical management of osteoarthritis to become standard, a paradigm shift with regards to treatment beliefs needs to occur for both people living with osteoarthritis and the clinicians who treat it (Hunter, 2011).

The funding and delivery of clinical health services for people with chronic musculoskeletal disease further impact treatments offered to people with hip and knee osteoarthritis in New Zealand. New Zealand's health system can be referred to as 'two-tiered'. One tier is the state-funded public health system. The other is the accident compensation service (Accident Compensation Corporation: ACC), which functions as a state-funded private insurance company (Ministry of Business, Innovation, and Employment, 2017). The belief regarding the two-tier system is based on the argument that ACC is better resourced than the public health system. However, ACC care only covers disability due to injury, as such most people living with hip and knee osteoarthritis do not meet the criteria for care in this system (Scott, 2008). One consequence of this is that people with osteoarthritis are often required to go onto a waitlist for publicly funded clinical services which typically means services are delayed (Broughton & Stewart, 2016). These are tertiary services that predominantly focus on pharmaceutical and surgical management. More recently, primary care initiatives that focus on conservative management for people with chronic musculoskeletal conditions have been developed. However, these services (Mobility Action Programmes: MAP)

are currently in the early stages of development and evaluation and are not widely available (Ministry of Health, 2017).

Research has separately investigated the health, illness and treatment beliefs of people living with hip and/or knee osteoarthritis (Baird, Yehle, & Schmeiser, 2007; Ballantyne, Gignac, & Hawker, 2007; Dosanjh, Matta, & Bhandari, 2009; Hall et al., 2008; Hudak et al., 2002; Kao & Tsai, 2012; Maly & Krupa, 2007; Parsons, Godfrey, & Jester, 2009; Suarez-Almazor, Richardson, Kroll, & Sharf, 2010; Toye et al., 2006), and the beliefs of clinicians who treat these people (Chevalier et al., 2004; Conrozier et al., 2008; Cottrell et al., 2010; Holden, Nicholls, Young, Hay, & Foster, 2009; Larsson, Liljedahl, & Gard, 2010; Wright, Hawker, Bombardier, Croxford, & Dittas, 1999). However, only a few studies have compared the beliefs of the two groups (Alami et al., 2011; Cordero-Ampuero, Darder, Santillana, Caloto, & Nocea, 2012; Poitras et al., 2010; Prasanna, Korner-Bitensky, & Ahmed, 2012), and an even smaller number of studies have investigated the models that underpin these beliefs (Kaptein et al., 2010; Nicholls, Hill, & Foster, 2013). Furthermore, no identified studies have investigated the health, illness and treatment beliefs held by people living with hip and/or knee osteoarthritis and the beliefs of clinicians who treat these people in the New Zealand context. The findings of such a study could be used to inform strategies to increase the use of conservative treatments for people with hip and/or knee osteoarthritis in New Zealand.

## **1.2 Research aims**

One aim of this research (thesis) was to identify, compare and contrast the osteoarthritis beliefs held by New Zealanders living with hip and/or knee osteoarthritis and the beliefs of the clinicians who treat the condition. The other aim of the thesis was to identify if people's and clinicians' osteoarthritis beliefs could be measured by existing questionnaires that are grounded in theoretical health, illness and treatment belief models. These aims led to the development of the following research questions.

- Question 1: What osteoarthritis health, illness and treatment beliefs are held by people living with hip and/or knee joint osteoarthritis in New Zealand?
- Question 2: Can an existing health, illness or treatment beliefs questionnaire adequately measure the osteoarthritis beliefs of people living with hip and/or knee osteoarthritis in New Zealand?

- Question 3: Are the treatment beliefs of people living with hip and/or knee osteoarthritis in New Zealand explained by an existing model(s) of health, illness or treatment beliefs?
- Question 4: What are the hip and knee osteoarthritis health, illness and treatment beliefs held by clinicians working in New Zealand?
- Question 5: Can an existing health, illness or treatment beliefs questionnaire adequately measure the hip and knee osteoarthritis treatment beliefs held by clinicians working in New Zealand?
- Question 6: Are the hip and/or knee osteoarthritis treatment beliefs held by clinicians working in New Zealand explained by an existing model(s) of health and illness beliefs, or clinical practice?
- Question 7: What are the similarities and differences in health, illness and treatment beliefs among and between clinicians and people living with hip and/or knee osteoarthritis in New Zealand

### **1.3 Glossary of key acronyms used in this thesis**

- COSMIN: Consensus-based Standards for the selection of health status Measurement Instruments
- CSM: Common Sense Model
- KOFBQ: Knee Osteoarthritis Fears and Beliefs Questionnaire
- IPQ-R: Illness Perception Questionnaire - Revised
- PABS-PT: Pain Attitudes and Beliefs Scale for Physiotherapists.

### **1.4 Delimitations of this research**

There are three delimitations of this research that merit discussion. The first delimitation relates to the decision to focus on the beliefs of people with osteoarthritis, and not other forms of arthritis such as rheumatoid arthritis or ankylosing spondylitis. The pathology and management of inflammatory arthropathies differs considerably from osteoarthritis, as such, people's beliefs about the conditions also differ (Erwin, Edwards, Woolf, Whitcombe, & Kilty, 2017a). Therefore, it was decided that only one form of arthritis should be included because combining the groups would cause confusion. The second delimitation relates to the decision to focus on the beliefs of people with hip and/or knee joint osteoarthritis. Osteoarthritis commonly affects a number of different joints in the body and is not limited to the hip and knee (Hochberg et al., 2015). However, the hip

and knee joints were selected for three reasons. One, these joints are reported as the two most commonly affected joints in the body (Cross et al., 2014). Two, the assessment methods of people with osteoarthritis of these two joints are similar (Rolfson et al., 2016). Three, the treatment options and expected disease progression is similar at each joint (Hochberg et al., 2015). Therefore, while osteoarthritis can affect many other joints in the body, it was anticipated that should more joints be included, differences in their prevalence, impairments, and treatment could lead to data that were too diverse to be analysed meaningfully. The third delimitation of the research relates to the decision not to explore where the beliefs come from or how they are formed. While this is a question that would merit exploration, it was decided that it would be beyond the scope of the present research. Including this question would broaden the focus of the research, lead to greater heterogeneity of the data and limit analysis. Therefore, it was decided that it was more important to establish what the beliefs were, before exploring where they came from.

## **1.5 Significance of the research**

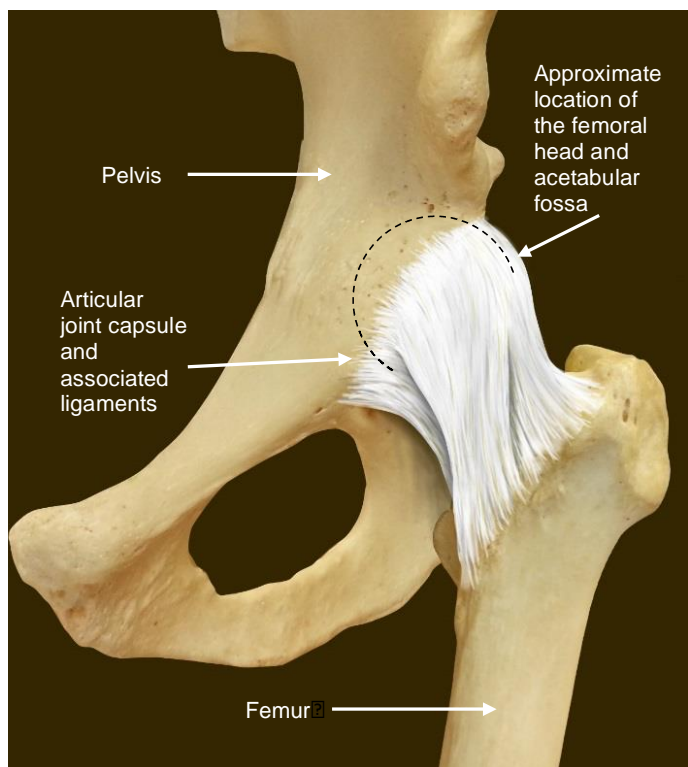
This research will have significance for people living with hip and/or knee joint osteoarthritis, clinicians who treat hip and knee osteoarthritis and healthcare funders. By understanding the osteoarthritis health, illness and treatment beliefs of people with the condition and those of clinicians, strategies may be implemented to overcome the barriers to conservative treatment use, and lead to better utilisation of these options for people with hip and/or knee osteoarthritis. These changes could lead to a reduction in joint replacement surgeries and a reduction in surgery-related costs. Furthermore, a better understanding of the treatment beliefs of both groups could result in improved patient and clinician education resources, as well as more person-centred clinical services for these patients. This education could in turn improve the quality of life and general health for people with the disorder and may reduce the reliance on current health services through better self-management.

## Chapter 2 Hip and knee joint osteoarthritis

The purpose of this chapter is to provide an overview of hip and knee joint osteoarthritis by addressing the following: (i) anatomy, (ii) aetiology, (iii) pathology, (iv) signs and symptoms, (v) clinical assessment, and (vi) treatment.

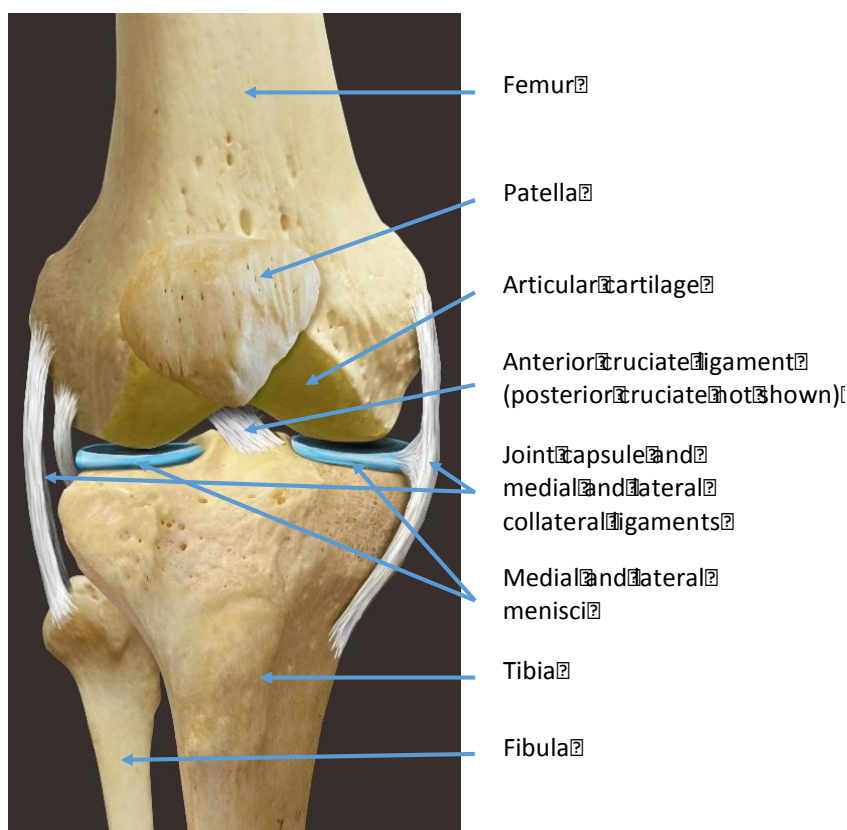
### 2.1 Anatomy of the hip and knee joints

The hip joint (*Figure 2*) is a weight-bearing synovial ball and socket joint formed via articulation of the head of the femur and the acetabular fossa of the pelvic bone (Drake, Vogl, & Mitchell, 2014). Smooth cartilage covers the articulating bony surfaces, which allows even movement of the joint in multiple directions (flexion and extension, abduction and adduction, and medial and lateral rotation). An articular capsule encloses that joint and is lined internally by a synovial membrane and supported externally by ligaments that connect the bones. The synovial membrane produces synovial fluid, which acts as a lubricant for the joint. A number of large muscles support the hip joint and provide both stability and mobility (e.g. psoas major and gluteus maximus).



**Figure 2.** Anterior view of the osteology and associated ligaments of the left hip joint.

The knee joint (*Figure 3*) is a weight-bearing modified hinge joint that is formed by articulations between the distal end of the femur, the proximal end of the tibia and the medial and lateral facets of the patella (Drake et al., 2014). The bony architecture allows flexion and extension, and a small degree of medial and lateral rotation at the joint. The patella is located in the trochlear groove on the anterior aspect of the distal femur and slides in a distal and proximal direction with knee movement. Articular cartilage covers the contacting surfaces of the bones. The tibia and femur articulate to form the tibiofemoral joint. The two menisci, which are located between the two bones and held in place by a number of small ligaments, improves that poor congruency between the curved femur and the flat tibia. Furthermore, the menisci act as shock absorbers and aid joint stability. However, joint stability primarily comes from the four major ligaments that connect the tibia and the femur (anterior cruciate, posterior cruciate, medial collateral and the lateral collateral). Like the hip joint, a synovial lined capsule surrounds the knee joint and a number of large muscles provide both stability and mobility (quadriceps femoris and hamstrings).



**Figure 3.** Anterior view of the osteology and associated cartilage and ligaments of the right knee joint with the capsule removed.

## 2.2 Aetiology

The aetiology of osteoarthritis of the hip and knee joints is known to be multifactorial (Hochberg et al., 2015). The disease typically occurs via a combination of personal and joint-related risk factors.

Personal factors commonly associated with an increased chance of developing osteoarthritis include increasing age, female gender, obesity and genetics (Palazzo et al., 2016). The exact association between osteoarthritis and increasing age is complex and is not currently fully comprehended (Hochberg et al., 2015). However, it is known that increasing age leads to thinning and fracture of the cartilage covering the articular surfaces of the joints. These changes can result in joint laxity predisposing the joint to increased shear stresses and injury, promoting progression of the disease (Cross et al., 2014). Joint laxity and instability are further compounded by sarcopenia (age-associated muscle loss) and changes in bone density (Cross et al., 2014). Increased body weight is believed to cause additional joint loading and damage. People who are obese are 2.66 times more likely (95% CI 2.15-3.28) to have knee osteoarthritis than people who are not obese (Silverwood et al., 2015). Osteoarthritis is characteristically more prevalent in women than men (odds ratio 1.6, 95% CI 1.37-2.07: Silverwood et al., 2015), the reason for this is linked to differences in hormones, joint alignment, cartilage volume and muscle strength (Cross et al., 2014).

Joint-related factors commonly associated with an increased risk of developing hip and knee osteoarthritis include previous joint injury, mal-alignment or abnormal joint loading, and muscle weakness. Osteoarthritis is primarily a mechanically mediated disease, and changes in joint loading can lead to disease development and progression (Racine & Aaron, 2013). Previous hip or knee joint injury is strongly associated with the development of osteoarthritis (Hochberg et al., 2015). If the injury damages structures that maintain the stability of the joint, such as the anterior cruciate ligament (ACL) or the medial meniscus of the knee, the likelihood of developing osteoarthritis is further increased. Rupture of the ACL predictably leads to the development of knee osteoarthritis in 13% of people within 10 to 15 years of the injury, this rate increases to between 20 and 40% if the injury also includes damage to other ligaments, bone or cartilage (Palazzo et al., 2016). Poor joint alignment is associated with the development of osteoarthritis and more strongly associated with progression of the disease (Cerejo et al., 2002; Johnson & Hunter, 2014). Excessive occupational loads have been linked to



disease development, especially if the job or occupation requires a lot of kneeling, squatting, lifting or climbing (Palmer, 2012). However, the association between joint loading due to sports or exercise participation and the development of hip and knee osteoarthritis is less clear (Palazzo et al., 2016). A high level of physical activity, such as the amount completed by a professional athlete, is associated with greater risk of developing knee osteoarthritis. However, a moderate level of physical activity appears to be protective for the joint (Alentorn-Geli et al., 2017). It is hypothesised that the harmful effects of excessive joint loading and potential risk of injury during sport and exercise, may be mitigated by the beneficial effects, such as weight loss and the maintenance of local muscle strength (Palazzo et al., 2016). Normally functioning muscles have a protective effect on hip and knee joints as they distribute load across the joint and help to maintain postural alignment. Conversely, weakness of muscles at or around joints can lead to the development of osteoarthritis due to a greater chance of injury and altered load management (Hochberg et al., 2015).

## 2.3 Pathology

Osteoarthritis is typically characterised by local changes in the cartilage, muscles, bone and synovial tissue at the joint. The pathology of hip and knee joint osteoarthritis is thought to be multifaceted, and a number of different factors contribute to the joint degeneration that occurs (Dell’Isola, Allan, Smith, Marreiros, & Steultjens, 2016). Commonly cited factors include biomechanical overload, premature ageing of the cartilage, metabolic mechanisms, inflammatory processes, and genetic traits (Hochberg et al., 2015). While biomechanical factors are known to be necessary for the development of osteoarthritis, it is still unclear what role the other factors play (Deveza et al., 2017; Hochberg et al., 2015; Mills, Hübscher, O’Leary, & Moloney, 2018). Although osteoarthritis was traditionally called non-inflammatory arthritis, there is a known inflammatory process that occurs within the joint; specifically inflammation of the synovial tissue or synovitis (Mandl, 2011). Synovial tissue inflammation is believed to be one of the key intra-articular processes that cause pain, as most other intra-articular structures are not innervated. Extra-articular structures that can become inflamed and cause pain include local bursa and connective tissue (Hochberg et al., 2015).

More recently, researchers have proposed more complex conceptualisations of the pathology of osteoarthritis that acknowledge the identified differences in signs,

symptoms and treatment responses between patients. Deveza et al. (2017) explored the identification and classification of different phenotypes in the presentation of osteoarthritis. For example, many phenotypes were based on pain trajectories and others on a combination of factors such as pain severity, catastrophizing and systemic inflammation (Deveza et al., 2017). Additionally, Mills et al. (2018) stated that a multi-factorial understanding of the pain mechanisms of the condition was needed to facilitate engagement with emerging pain-modulating treatments such as psychological interventions and pain education. Both of these studies indicate that a biomedical or biomechanical view of osteoarthritis does not fully explain the pathology and the expression of symptoms (Deveza et al., 2017; Mills et al., 2018).

## **2.4 Signs and symptoms**

For most people with osteoarthritis, the signs and symptoms of the disease develop insidiously. Additionally, many people experience exacerbations of their osteoarthritis which frequently causes pain and can lead them to seek medical attention (Hochberg et al., 2015). Exacerbations can also result in changes in gait and functional ability, pain on palpation of the joint, and localised swelling (Hochberg et al., 2015).

Pain and joint stiffness are the most common symptoms, though the nature of these differs between the two joints (Bennell, 2013; Bennell & Hinman, 2011). People with knee joint osteoarthritis typically locate their pain on the medial aspect of the joint. Knee flexion is usually limited first, followed by a loss of end range extension, and climbing and descending stairs are often the most painful functional activities. In contrast, people with hip joint osteoarthritis typically describe groin and/or buttock pain, and the first movements affected are usually internal rotation, adduction and flexion. Most weight-bearing activities can aggravate symptoms, especially if the action requires abduction or adduction of the joint. Additionally, people with hip osteoarthritis often report experiencing night pain, a symptom not common in people with knee osteoarthritis.

People frequently describe additional signs and symptoms attributed to osteoarthritis, including fatigue, activity changes, sleep disruption, anxiety and depressive mood (Conaghan et al., 2015; Sharma, Kudesia, Shi, & Gandhi, 2016). Joint stiffness is primarily attributed to a loss of tissue integrity both at and near the joint, however, it has also been linked to fear avoidance (Sharma et al., 2016). People with osteoarthritis commonly demonstrate fear-avoidance beliefs and behaviours which are associated with

anxiety and a reluctance to move joints, often due to fears about causing further joint damage and pain (Sharma et al., 2016). Activity changes, fatigue and sleep disruption, are typically described as a consequence of inadequate pain management (Conaghan et al., 2015). Depression is more common in people with osteoarthritis than in people without osteoarthritis (Sharma et al., 2016). Research suggests that this high prevalence of depression is due to chronic pain, beliefs about a loss of function and anxiety about anticipated disease progression (Hawker et al., 2011; Murphy, Alexander, Levoska, & Smith, 2013; Sharma et al., 2016).

## **2.5 Clinical assessment**

Due to the range of different signs and symptoms associated with hip and knee osteoarthritis, a number of clinical assessment measures are recommended when assessing people with the condition (Rolfson et al., 2016). While imaging is often used to confirm the presence of bony and soft tissue changes (radiographic osteoarthritis), assessment of the clinical signs and symptoms is enough to make the diagnosis (Phan et al., 2005). Additionally, as only half of people with radiographic osteoarthritis have clinical symptoms, the assessment of a patient's signs and symptoms may be more clinically relevant (Jordan et al., 2007).

The clinical assessment is commonly divided into two sections, the subjective interview and the objective assessment. The subjective interview typically includes the collection of a report of the patient's account of their symptoms such as the location and intensity of pain, duration of symptoms, factors that can aggravate or ease symptoms, and the presence of a daily pain pattern (Hochberg et al., 2015).

The objective assessment measures can be categorised into one of three groups: (i) observable or functional changes, (ii) patient-reported outcome measures (PROMs), or (iii) diagnostic imaging (Hochberg et al., 2015; Rolfson et al., 2016). The assessment of observable or functional changes usually includes measures of the physical signs or impairments associated with osteoarthritis or the use of standardised functional tests (Rolfson et al., 2016). Changes can include observation and palpation of bony or soft tissue enlargement, joint line tenderness, or poor joint alignment, as well as measures of joint range of motion and localised muscle strength (Hochberg et al., 2015). There are a number of standardised measures of physical function. An example of one validated measure commonly used with people with hip and knee osteoarthritis is the Timed Up and Go test (TUG: Kennedy, Stratford, Wessel, Gollish, & Penney, 2005). The TUG

test requires a person to rise from a seated position and walk around a marker and return to the seat. The time taken to complete the task is recorded.

PROMs assess the impact of the disease on factors that cannot necessarily be measured by physical assessment. Many PROMs have been validated for people with hip and knee osteoarthritis and measure constructs such as health-related quality of life (HRQoL), pain, mood and perceived activity limitations (Table 1: Hochberg et al., 2015; Rolfson et al., 2016).

**Table 1.**

*Common Osteoarthritis Patient Reported Outcome Measures*

Construct	PROMs
Health-related quality of life	Arthritis Impact Measurement Scale (AIMS2) Short Form-36 (SF-36)
Pain	Western Ontario and McMaster Universities Arthritis Index (WOMAC: pain scale) P4 Scale
Mood	Hospital Anxiety and Depression Scale (HADS)
Perceived activity limitations	Western Ontario and McMaster Universities Arthritis Index (WOMAC: activity scale) Hip Osteoarthritis Outcome Score (HOOS) Knee Osteoarthritis Outcome Score (KOOS)

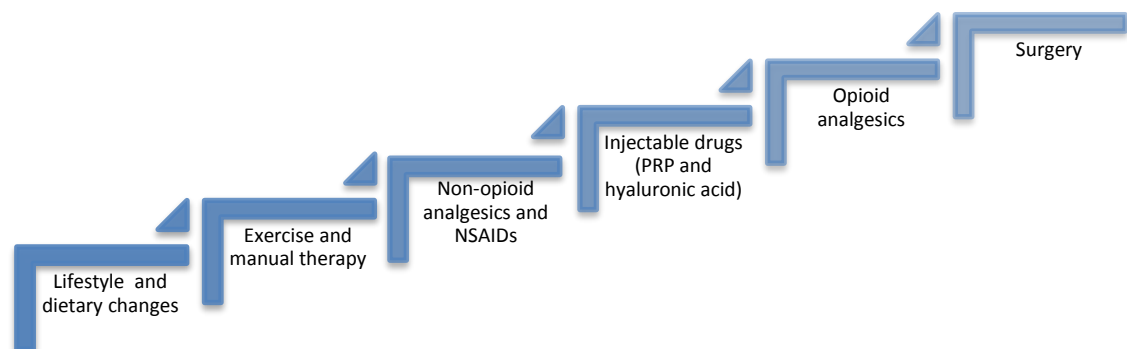
Note: AIMS2 (Meenan, Mason, Anderson, Guccione, & Kazis, 1992), SF-36 (Hawker, Mian, Kendzerska, & French, 2011), WOMAC (Bellamy, Buchanan, Goldsmith, Campbell, & Stitt, 1988), P4 (Spadoni, Stratford, Solomon, & Wishart, 2004), HADS (Zigmond & Snaith, 1983), HOOS (Nilsson, Lohmander, Klässbo, & Roos, 2003), and KOOS (Roos & Toksvig-Larsen, 2003).

X-ray is the most common form of diagnostic imaging used on people with hip and knee osteoarthritis. Other methods of imaging include magnetic resonance imaging, computerised tomography and diagnostic ultrasound (Hochberg et al., 2015).

Radiographic imaging allows for an assessment of joint space narrowing, subchondral bony changes and osteophyte formation. The Kellgren-Lawrence scale is routinely used to grade observed changes and consists of a four-point scale used to categorise changes visible on X-ray (Hochberg et al., 2015). However, due to the known discordance between X-ray findings and clinical symptoms, it is argued that assessment and treatment should not be guided solely by imaging results (Neogi et al., 2009; Phan et al., 2005).

## 2.6 Treatment

The focus of treatment for osteoarthritis is on the maintenance of physical function, symptom modification and limiting disease progression (Hochberg, Silman, Smolen, Weinblatt, & Weisman, 2015). Usual osteoarthritis treatments are frequently placed in one of three categories; non-pharmacological, pharmacological and surgical (Hochberg et al., 2015). The National Institute for Health and Care Excellence (NICE) Osteoarthritis Guidelines (2014) advocate for a staged progressive model of clinical management, which shows a progression from non-pharmacological, to pharmacological, to surgical management of osteoarthritis (*Figure 4*). Furthermore, clinical guidelines recommend that treatments such as lifestyle change, weight loss, exercise and manual therapy (non-pharmacological), should be exhausted prior to considering medication or surgery (Bennell, 2013; Bennell & Hinman, 2011; Dean & Gormsen Hansen, 2012; Fransen et al., 2015; Merashly & Uthman, 2012; Van Manen, Nace, & Mont, 2012; Zhang et al., 2008).



**Figure 4.** Osteoarthritis management staircase, adapted from NICE OA Guidelines (2014).

Non-pharmacological treatments are described as the cornerstone of management for people with hip and knee osteoarthritis and include treatments such as patient education, lifestyle and dietary changes, and exercise (Bennell, 2013; Fransen et al., 2015; Hunter & Lo, 2009). In particular, there is abundant evidence supporting exercise-based treatments for people with hip and knee osteoarthritis. In a Cochrane review, Fransen et al. (2015) demonstrated that there was high quality evidence showing that exercise interventions lead to improvements in pain and quality of life for people with hip and knee osteoarthritis. Additionally, the authors found moderate quality evidence that suggests that exercise can positively effect physical function (Fransen et al., 2015). While the treatment effect size of exercise interventions range

from small to moderate, they are similar to those achieved with pharmacological interventions (Fransen et al., 2015). Other research has found similar findings for exercise for people with osteoarthritis of the hip joint (Beumer et al., 2016; Sampath, Mani, Miyamori, & Tumilty, 2015). Exercise can positively influence muscle function, body weight, cardiovascular fitness, mood and disease progression (Bennell, Dobson, & Hinman, 2014; Bennell & Hinman, 2011; Fransen et al., 2015; Kujala, 2009; Zhang et al., 2008). The addition of therapies such as joint mobilisation and manipulation, to exercise programmes is also beneficial (Bennell, 2013; Crossley et al., 2015; Fitzgerald et al., 2016). Fitzgerald et al. (2016) found that manual therapy, when added to an exercise programme resulted in greater reductions in short to medium term pain than exercise alone for people with knee osteoarthritis.

Furthermore, this combined treatment is regarded as a cost effective treatment option when compare to usual care (Pinto, Robertson, Abbott, Hansen, & Campbell, 2013). In contrast, the evidence supporting the merit in using manual therapy for people with hip osteoarthritis is much weaker than for the knee (Sampath, Mani, Miyamori, & Tumilty, 2015). Other non-pharmacological interventions include treatments such as cryotherapy, bracing or joint support, mobility aids, orthotics and transcutaneous electrical nerve stimulation (TENS) (Hochberg et al., 2015).

Pharmacological treatments for osteoarthritis primarily centres around pain control and are guided by a person's symptoms (Conaghan et al., 2015; van Laar et al., 2012). A progressive approach is recommended, beginning with the prescription of weaker analgesics and non-steroidal anti-inflammatory drugs, and moving to stronger medications as required (van Laar et al., 2012). Furthermore, research suggests that analgesic medication in combination with exercise is better than medication alone (Allen et al., 2016; Lee, Cooke, Cooper, & Shield, 2017; Skou et al., 2016). More recently, the prescription of tricyclic antidepressant drugs has become popular for people with more severe osteoarthritis, as it is believed the drug can positively effect both chronic pain and depressive symptoms (van Laar et al., 2012). There is limited evidence regarding the efficacy of intra-articular injection of drugs such as corticosteroids, although these treatments are still commonly prescribed (Godwin & Dawes, 2004; Hochberg et al., 2012).

The management of hip and knee joint osteoarthritis commonly includes joint surgery. Surgical intervention ranges from minor procedures such as arthroscopic debridement of the joint, where roughened cartilage surfaces are removed or repaired, through to

total joint replacement (TJR) (Hochberg et al., 2015). Recently, the efficacy of arthroscopic surgery has been questioned (Harris, 2016). However, TJR continues to be regarded as one of the most effective treatment options for people with advanced hip and knee osteoarthritis (Gustafsson, Ekman, Ponzer, & Heikkilä, 2010; Parsons et al., 2009). Total joint replacement surgery is known to improve quality of life, pain and physical function for people with hip and knee osteoarthritis (Ethgen, Bruyère, Richy, Dardennes, & Reginster, 2004; Ferket et al., 2017). One main disadvantage of TJR is cost. TJRs are expensive, and some authors state that the demand for this surgery has already surpassed the ability of many national health services to provide it (Harris, 2016; Leskinen, Eskelinen, Huhtala, Paavolainen, & Remes, 2012; Willis, 2015).

Complementary and alternative medicine approaches are not usually described in osteoarthritis treatment guidelines. Yet, complementary or alternative treatments frequently used by people with osteoarthritis include modalities such as traditional acupuncture, massage, and dietary supplements like fish oil or magnesium (Long, Soeken, & Ernst, 2001; Silva, El-Metwally, Ernst, Lewith, & Macfarlane, 2011). While many of these treatments appear to be commonly employed, their efficacy appears limited (Silva et al., 2011).

## **Chapter 3 Review of literature relevant to people's beliefs about the treatment of hip and knee joint osteoarthritis**

This chapter is a narrative review of research literature associated with people's beliefs about hip and knee osteoarthritis. The chapter commences with description of the search methods used to identify the literature that informed this review. Next is a review of the common beliefs that people have about osteoarthritis and its treatment. Then the methods and measures employed to investigate these beliefs are discussed. The chapter concludes with an outline of the models of health, illness and treatment that act as frameworks for investigating these beliefs.

### **3.1.1 Literature search**

A comprehensive computerised literature search was undertaken of electronic databases including CINAHL Plus, SocINDEX, MEDLINE, SPORTDiscus, PsycINFO, and SCOPUS via EBSCO host on the 22<sup>nd</sup> of January 2013. Search term selection was informed by key words from the research question. The terms were purposefully kept broad so that the search could include suitable studies that may not have been identified with more restrictive search terms. The following terms were used to construct the search: osteoarthritis\*, chronic illness\*, disease\*, musculoskeletal\*, belief\*, attitude\*, perception\*, treatment\*, model\*, common sense model and patient\*.

The doctoral candidate first screened the titles of the identified studies to exclude duplicates and select studies that included the main concept of osteoarthritis health, illness and/or treatment beliefs of people who live with the disease. The candidate then read the abstracts of the selected studies and evaluated their appropriateness using the inclusion and exclusion criteria defined below (3.1.2 & 3.1.3). Abstracts that met any of the exclusion criteria were excluded from the study. When the abstract met the inclusion criteria, the full-text version was sourced and read. Additionally, reference lists of the included studies were manually screened for further suitable studies.



### **3.1.2 Inclusion criteria**

Studies were included in the narrative review if they were written in English; described health, illness and/or treatment beliefs; related to the management of people with osteoarthritis; and had the full text available.

### **3.1.3 Exclusion criteria**

Studies were excluded if they were not published in a peer-reviewed journal, or if they focused primarily on inflammatory forms of arthritis. Studies described in the grey literature (i.e. research reports not subjected to peer review, working papers or government documents and unpublished theses) were not included as they may not have been subjected to suitable peer review.

### **3.1.4 Search Returns**

Sixty-six articles met the inclusion criteria and informed the narrative literature review described in this chapter.

## **3.2 People's osteoarthritis beliefs**

People's osteoarthritis health, illness and treatment beliefs are multifactorial. Therefore, the findings of the reviewed studies are discussed under the headings of causes, consequences, treatment, emotional and psychological well-being, and support.

### **3.2.1 Causes**

A number of the identified studies explored people's beliefs about the cause of osteoarthritis. People's beliefs about the cause of osteoarthritis were typically in keeping with the known aetiology, as they named causes such as ageing, joint wear and tear, and occupation (Appelt et al., 2007; Jeffery, Wylde, Blom, & Horwood, 2011; Kao & Tsai, 2012; Turner & Turner, 2007). However, findings show some people also suggest more idiosyncratic explanations, such as running barefooted as a child at school or having a cold draft on the joint (Turner & Turner, 2007). Many people reported viewing osteoarthritis as a natural part of ageing. This belief appeared particularly evident in older people, over 80 years of age, and those with higher levels of education (Appelt et al., 2007; Turner & Turner, 2007). In contrast, younger people were more

inclined to associate the development of osteoarthritis to factors such as occupation or previous injury (Kao & Tsai, 2012).

### 3.2.2 Consequences

People living with osteoarthritis hold many beliefs about how they expect the disease to progress and the consequences of the disease. Some people hold fatalistic beliefs about the condition, thinking that coping with the symptoms is an expected part of everyday life as people age (Ballantyne et al., 2007; Morden et al., 2011; Poitras et al., 2010). Several studies identified people who perceived living with pain, functional limitations and reduced physical activity as the usual outcome of osteoarthritis (Baird et al., 2007; Hall et al., 2008; Parsons et al., 2009). Baird et al. (2007) showed that some people believed having osteoarthritis meant that many of their normal activities of daily life had to cease and life was now restricted. Likewise, findings suggest that people living with osteoarthritis often experience marked changes in their ability to socialise (Ballantyne et al., 2007; Hall et al., 2008; Morden et al., 2011; Parsons et al., 2009). For some this sense of isolation was imposed by their reduced physical ability and mobility. Whereas for others it was associated with changes in the way they perceived being viewed by their friends, family, and peers (Hall et al., 2008; Morden et al., 2011; Parsons et al., 2009). Also, a loss of physical mobility due to osteoarthritis has been linked to a perceived loss of self-worth (Maly & Krupa, 2007).

Osteoarthritis is viewed as a disease that steadily and progressively gets worse over time (Appelt et al., 2007). Furthermore, a commonly held belief was that joint replacement surgery was an inevitable consequence of this gradual increase in symptoms and disability. It was not a question of *if* surgery was necessary, but *when* surgery was necessary (Conner-Spady et al., 2014; Frankel et al., 2012; Hall et al., 2008; Toye et al., 2006). In contrast, three studies indicated that many people wanted to delay or even avoid surgery if they could (Ballantyne et al., 2007; Dosanjh et al., 2009; Hudak et al., 2002).

### 3.2.3 Treatment

A wide range of osteoarthritis treatment modalities are frequently reported in the literature, including surgery, physiotherapy and exercise, medication, complementary and alternative medicine (CAM), and patient education (Dean & Gormsen Hansen,

2012; Fransen & McConnell, 2008; Merashly & Uthman, 2012; Van Manen et al., 2012; Zhang et al., 2008). However, much of the included literature exploring people's beliefs about osteoarthritis treatment focused on surgical management of the condition, with it often being viewed positively (Ballantyne et al., 2007; Gonzalez Sáenz de Tejada et al., 2010; Gustafsson et al., 2010; Hall et al., 2008; Hawker, Wright, Badley, Coyte, & Toronto Arthroplasty Health Services Research Consortium, 2004; Kroll, Richardson, Sharf, & Suarez-Almazor, 2007; McHugh, Luker, Campbell, Kay, & Silman, 2007; Nilsson et al., 2003; Suarez-Almazor et al., 2010; Toye et al., 2006). Specifically, people expected surgery would lead to a decrease in pain, and improvement in function, physical activity, and mental well-being (Gonzalez Sáenz de Tejada et al., 2010; Hawker et al., 2004; Nilsson et al., 2003). The power of beliefs about the benefit of surgery was highlighted by Gustafsson et al. (2010), who found that many participants viewed surgery as an extension of their life because they felt it would enable them to return to activities that were being limited by osteoarthritis. Moreover, some research indicates that positive beliefs and expectations regarding surgery lead to better post-surgical outcomes (Engel, Hamilton, Potter, & Zautra, 2004). As well as this, people with higher levels of perceived illness severity were more inclined to consider surgery, regardless of their functional ability (Hawker et al., 2010). Nilsson et al. (2009) found that patients, despite often not reaching anticipated post-surgical functional and activity levels, still reported high satisfaction with their surgery. People's beliefs about when they are appropriate for surgery have been shown to vary considerably. Some people appear to opt for surgery early, while others choose to hold off as long as possible, with some patients admitting to concealing symptoms to avoid surgery (Hawker et al., 2010; McHugh et al., 2007; Street Jr., Makoul, Arora, & Epstein, 2009).

More diversity was seen in people's beliefs and expectations regarding exercising, than for surgery. People's beliefs regarding exercise and physiotherapy may explain the low levels of patient engagement and poor adherence to exercise programmes (Pisters et al., 2010; Poitras et al., 2010). Findings indicate that people typically know they should be exercising, but many still perceive barriers to exercising, such as low levels of motivation and a belief that exercise will lead to further pain (Holden, Nicholls, Young, Hay, & Foster, 2012; Thorstensson, Roos, Petersson, & Arvidsson, 2006). Holden et al. (2012) identified that some participants perceived exercise would cause more damage to

their joints and consequently believed that, by prescribing exercise, physiotherapists were practising unethically.

Exercise therapy and surgery are not the only treatment modalities known to be effective for people with osteoarthritis. There is evidence that patient education improves outcomes following surgery, pharmaceutical interventions reduce pain, and the use of complementary and alternative medicine is common (Callahan et al., 2009; Holden et al., 2012; Hunter & Lo, 2009; Jones et al., 2011). However, only a few studies described people's beliefs about these other forms of treatment (Callahan et al., 2009; Holden et al., 2012; Hunter & Lo, 2009; Jones et al., 2011).

### **3.2.4 Emotional and psychological well-being**

Living with osteoarthritis can affect a person's emotional and mental well-being, which can have an impact on beliefs about the condition. Rates of depression and anxiety are known to be higher for people living with osteoarthritis than those without the condition (Sharma et al., 2016). Additionally, these psychological conditions are believed to contribute to feelings of anger, frustration, vulnerability, fragility and a loss of personal control (Appelt et al., 2007; Parsons et al., 2009; Toye et al., 2006; White et al., 2012). The diagnosis of osteoarthritis has been shown to change the way people see themselves, prompting feelings of ageing or being old (Morden et al., 2011; Parsons et al., 2009; Smythe, Larmer, & McNair, 2012). Research has presented that some people feel clinicians underestimate the fears and anxieties associated with living with osteoarthritis (Street et al., 2009).

'Breaking point' was a term commonly referred to in the literature. It was defined as the point when a person living with osteoarthritis 'breaks' both psychologically and emotionally, and decides that he or she wants or needs surgical intervention (Dosanjh et al., 2009; Gustafsson et al., 2010; Hall et al., 2008; McHugh et al., 2007; Smythe et al., 2012). For a number of people, this was a breaking of the psychological tolerance of the person and an inability to continue to cope with pain (Smythe et al., 2012). Findings show that some people believed that it was necessary to reach this point before surgery was appropriate or merited (Hawker et al., 2010; Smythe et al., 2012). Of interest, several people anticipated improvements in their physical function and psychological well-being following joint replacement surgery (Gonzalez Sáenz de Tejada et al., 2010).

### **3.2.5 Support**

The literature suggests that many people living with osteoarthritis hold beliefs about the quality of support they receive from healthcare professionals. Support included factors such as patient education, counselling and guidance. People reported feeling unsupported by healthcare professionals due to perceptions about receiving limited education and advice about available treatment modalities and self-management strategies (Hill, Dziedzic, & Ong, 2011; Holden et al., 2012; Jeffery et al., 2011; McHugh et al., 2007). Many people reported receiving conflicting information from healthcare professionals about the most appropriate clinical management of osteoarthritis (Hampson, Glasgow, & Zeiss, 1994; McHugh et al., 2007). Additionally, McHugh et al. (2007) established that many participants in their study connected the belief of not being supported by their healthcare professional(s) to poor patient-clinician communication on the part of the clinician.

## **3.3 Methodological factors that may have influenced the findings**

Several methodological factors that may have contributed to the diverse range of people's beliefs found in the reviewed literature. These factors were age requirements for participants, participant recruitment methods, the research methodologies employed, and measurement methods.

### **3.3.1 Participant age**

Many of the studies had a minimum age inclusion criterion (Ang, Shen, & Monahan, 2008; Appelt et al., 2007; Gustafsson et al., 2010; Hampson et al., 1994; Hawker et al., 2010; Hill et al., 2011; Holden et al., 2012; Kroll et al., 2007; Mitchell, Carr, & Scott, 2006; Morden et al., 2011; Parsons et al., 2009; Suarez-Almazor et al., 2010; Turner & Turner, 2007; White et al., 2012). In one study this was defined as over 65 years of age (Gustafsson et al., 2010). While previously described as an older people's disease, the diagnosis of people with osteoarthritis in their mid-forties is now common (Kao & Tsai, 2012; Smythe et al., 2012). Therefore, excluding younger patients could misrepresent the beliefs identified in these studies, as it has been shown that beliefs regarding osteoarthritis change with age (Appelt et al., 2007). Such inclusion criteria may restrict

research results because the findings may not reflect the beliefs of the wider range of people living with osteoarthritis.

### **3.3.2 Recruitment methods**

A number of the studies included participants recruited from surgical waiting lists or orthopaedic clinics (Ang et al., 2008; Appelt et al., 2007; Dosanjh et al., 2009; Engel et al., 2004; Gonzalez Sáenz de Tejada et al., 2010; Gustafsson et al., 2010; Hall et al., 2008; Jones et al., 2011; Nilsson et al., 2009; Street Jr. et al., 2009; Toye et al., 2006). Bias may have occurred because people who have already decided to have surgery may hold different beliefs and expectations from those who do not want or have not yet considered surgery. In particular, recruitment from this population could lead to overly positive beliefs regarding surgery as a treatment modality, especially when compared to the general population of people living with osteoarthritis. A few studies employed different recruitment methods and recruited participants from community-based elderly care facilities, local primary healthcare services, or used a sample of convenience (Baird et al., 2007; Jeffery et al., 2011; Smythe et al., 2012).

### **3.3.3 Research methodologies**

The range of findings could in part be due to the use different research methodologies and/or the diverse methods used to collect data. Both qualitative and quantitative methods have been used to examine people's beliefs about osteoarthritis. Different paradigms can lead to distinctive points of view, understandings or conclusions (Creswell & Plano Clark, 2011). However, these differences can be considered positively, as it can provide a broader, more diverse, and more holistic understanding of the phenomenon (McPherson & Kayes, 2012).

Typically, the researchers who used qualitative methodologies aimed to understand or explore the perspectives or experiences of people living with osteoarthritis. For example, the experiences of living with or seeking treatment for osteoarthritis (Kroll et al., 2007; Maly & Krupa, 2007; Smythe et al., 2012). Qualitative methodologies included those with limited levels of interpretation, such as Content Analysis or Framework Analysis (Ballantyne et al., 2007; McHugh et al., 2007), as well as those that are highly interpretive, such as Hermeneutic Phenomenology or Grounded Theory (Baird et al., 2007; Gustafsson et al., 2010; Smythe et al., 2012). Data collection was

commonly conducted using semi-structured face-to-face individual interviews conducted at one time-point (Baird et al., 2007; Ballantyne et al., 2007; Holden et al., 2012; Jeffery et al., 2011; Kao & Tsai, 2012; Maly & Krupa, 2007; Thorstensson et al., 2006; Toye et al., 2006; Turner & Turner, 2007). In contrast, the researchers who used quantitative methods frequently aimed to described general beliefs and behaviours, and the data were mostly collected by questionnaire (Hawker et al., 2004; Kaptein et al., 2010). Such differences in methodologies and methods may have affected the findings of the studies and make it challenging to compare results between studies.

### **3.3.4 Measurement methods**

The variety of measurement methods used to collect data may have affected study findings. The qualitative studies primarily used individual semi-structured interviews to collect data. However, a few studies used other methods of data collection including participant diaries, focus groups, repeated interviews and unstructured interviews (Morden et al., 2011; Smythe et al., 2012; Suarez-Almazor et al., 2010). In contrast, many different measures were identified in studies using a quantitative methodology. Some studies included measures designed specifically for collecting data on arthritis-related health beliefs, such as the Arthritis Impact Measurement Scale 2 and Arthritis Health Beliefs Instrument (Ang et al., 2008; Meenan et al., 1992), whereas other studies included more generic health beliefs questionnaires such as the Illness Perception Questionnaire – Revised (IPQ-R: Bijsterbosch et al., 2009; Kaptein et al., 2010; Mitchell et al., 2006). Many of these studies employed additional questionnaires that explored associated beliefs, including beliefs about quality of life (Short Form-36, and European Quality of Life questionnaire), emotional well-being (Fear-Avoidance Beliefs Questionnaire, and the Anxiety Scale), and perceived functional ability (Western Ontario and McMaster Universities Osteoarthritis Index [WOMAC] and Knee injury and Osteoarthritis Outcome Scale [KOOS]) (Appelt et al., 2007; Engel et al., 2004; Hawker et al., 2004; Kaptein et al., 2010; Mitchell et al., 2006; Nilsson et al., 2009; White et al., 2012). Several researchers developed their own questionnaire about patients' beliefs and expectations, although it was not clear if these researcher-generated questionnaires had been validated (Appelt et al., 2007; Engel et al., 2004; Gonzalez Sáenz de Tejada et al., 2010; Nilsson et al., 2009; Street Jr. et al., 2009).

### **3.4 Health, illness and treatment belief models related to osteoarthritis**

The diverse range of beliefs found may also be due differences in the theoretical underpinning of the questionnaires used in the studies. Health, illness and treatment belief models are theoretical models created to aid the understanding of the interaction between psychological variables, health beliefs and behaviour (Walsh, Lynch, Murphy, & Daly, 2004). Research has indicated that most people create models or representations of their health or illness, and in many cases, these are part of a larger belief system (Weinman, Petrie, Moss-Morris, & Horne, 1996). Much of the identified research exploring people's beliefs regarding the treatment of osteoarthritis did not appeared to be guided by an explicit theoretical model. Only five of the identified articles were explicitly underpinned by a theoretical health beliefs model (Ang et al., 2008; Bijsterbosch et al., 2009; Hampson et al., 1994; Kaptein et al., 2010; Nicholls, Hill, & Foster, 2013).

Three formal beliefs models were identified, the Personal Models of Illness (PMI: Hampson et al., 1994), the Health Beliefs Model (HBM: Ang et al., 2008), and Common Sense Model (CSM: Bijsterbosch et al., 2009; Kaptein et al., 2010; Nicholls et al., 2013). The Body as a Machine Model and the Spare Parts Model were not explicitly described in the literature but appeared to relate to some of the study findings (Frankel et al., 2012; Kao & Tsai, 2012; Turner & Turner, 2007). Additionally, these two models merit discussion because of the current popularity of the biomechanical view of the body in health care (Helman, 2007; Nicholls & Gibson, 2010).

#### **3.4.1 Body as a Machine Model and the Spare Parts Model**

The Body as a Machine Model and the Spare Parts Model are two models of health beliefs best described as lay models (Helman, 2007). While both models have not been formally explored in the context of osteoarthritis, they merit discussion because of the common belief that osteoarthritis is due to joint wear and tear, as well as the popularity of total joint replacement surgery (Frankel et al., 2012; Kao & Tsai, 2012; Turner & Turner, 2007). The two models are similar. The Body as a Machine Model has been driven by the use of mechanical metaphors to described body function and has been facilitated by health professionals through the use of explanations and analogies told to patients (Helman, 2007; Nicholls & Gibson, 2010). By expanding on the concept of the



body as a machine, the Spare Parts Model implies that as different parts of the body wear out, they can merely be replaced with new ones (Helman, 2007). In spite of being described as lay models, given the high utilisation of joint replacement surgery in people with osteoarthritis, it is conceivable that these models could also explain some of the beliefs held by clinicians (Nicholls & Gibson, 2010).

### **3.4.2 Personal Models of Illness**

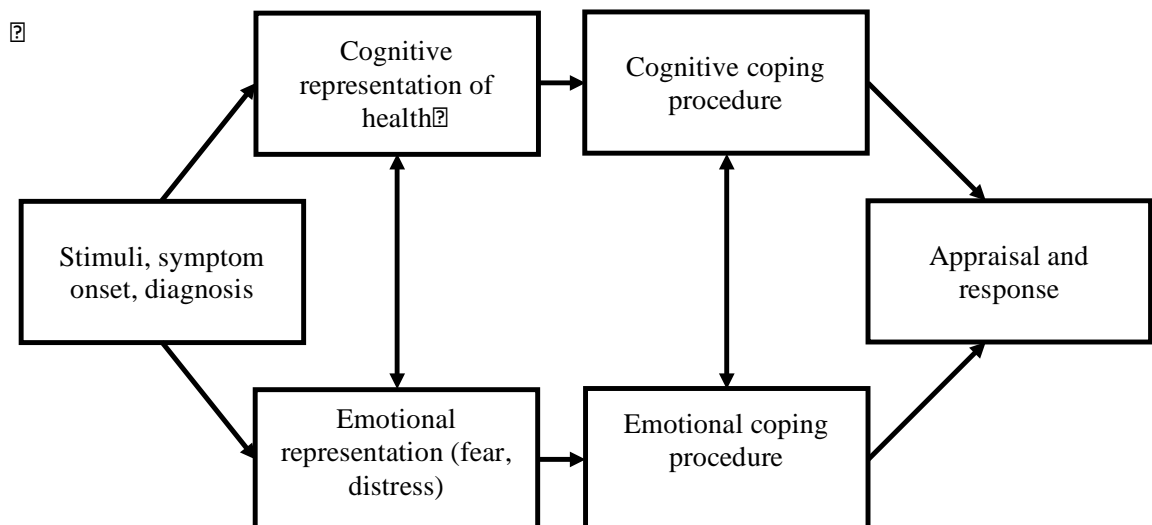
The Personal Models of Illness (PMI) is a beliefs model previously employed to guide the exploration of people's osteoarthritis beliefs (Hampson et al., 1994). The model's constructs include symptoms, seriousness, cause, control, helpfulness of treatment, and negative feelings. These constructs are very similar to those of the CSM, and it appears that the PMI may be an iteration of the CSM (Hampson et al., 1994). Hampson et al. (1994) used structured patient interviews to collect data about people's osteoarthritis beliefs and then compared these findings to the PMI constructs. The authors showed that only three significant relationships were identified between the data and the constructs, and concluded the PMI was a poor fit for the osteoarthritis population (Hampson et al., 1994).

### **3.4.3 The Health Beliefs Model**

Rosenstock and colleagues first proposed the Health Beliefs Model (HBM) as an explanation of factors that influence a person's decision to seek medical attention (Janz & Becker, 1984; Rosenstock, 1966). Researchers have used the model to explain people's health beliefs in the context of numerous diseases, including osteoarthritis (Ang et al., 2008; Bond, Aiken, & Somerville, 1992; Jalilian, Motlagh, Solhi, & Gharibnavaz, 2014; Koch, 2002). The model demonstrates that a person's treatment-seeking behaviour is influenced by beliefs about the perceived severity of and susceptibility to the condition, barriers to implementing the treatment and benefits of treatment (Rosenstock, 1966). The Arthritis-related Health Beliefs Instrument (AHBI) is underpinned by the HBM and explores beliefs about the four constructs. Ang et al. (2008) used the AHBI to explore White and Afro-American people's beliefs about the decision to have knee joint replacement surgery and suggested that the questionnaire was appropriate for use with these populations.

### 3.4.4 The Common Sense Model

The CSM was the most common theoretical model utilised in the studies identified in the review, with three reviewed studies employing the model (Bijsterbosch et al., 2009; Kaptein et al., 2010; Nicholls et al., 2013). The model has similarly been used to explain health beliefs relating to a variety of other conditions, from cardiac illness to head injury (Walsh et al., 2004; Whittaker, Kemp, & House, 2007). The CSM is also referred to as the Illness Perception Model, the Illness Representation Model, the Self-Regulatory Model, the Common Sense Model of Self-Regulation, and Leventhal's Model (Hale, Treharne, & Kitas, 2007). The model was developed during the 1960s and early 1970s and is constructed from findings of large qualitative studies in which people were asked about their personal beliefs regarding health (Leventhal, Weinman, Leventhal, & Phillips, 2008). The model shows that a stimulus is processed both cognitively and emotionally and both of these processes are first interpreted regarding their representation, and secondly concerning the coping required (*Figure* ). The result of these two parallel processes is the subsequent appraisal and response. It is proposed that a person's illness representations are based on five distinct components, which determine their ability to cope (Lau, Bernard, & Hartman, 1989). The components are: (i) *identity* of the disease, the (ii) likely *cause* of the disease, (iii) *timeline* or the duration of the disease, (iv) *consequences* or the beliefs regarding the impact of the disease, and (v) *cure* or the degree to which the patient believes the disease can be affected by treatment (Lau et al., 1989).



**Figure 5.** Common Sense Model (adapted from Walsh et al., 2004 and Leventhal et al., 1997).

The Illness Perception Questionnaire (IPQ: Weinman et al., 1996) and more recently the IPQ-Revised (IPQ-R: Moss-Morris et al., 2002) were developed to assess the components of illness representations contained in the CSM. Kaptein et al. (2010) investigated the correlation between illness perception and functional outcome with the IPQ-R in people with osteoarthritis and found that illness perceptions were associated with changes in outcome. The authors identified that participants with more negative beliefs had worse scores of perceived function over time, independent of objective measures of function (Kaptein et al., 2010). In contrast, Nicholls et al. (2013) explored the utility of the IPQ-R with primary care patients with chronic musculoskeletal conditions and concluded that further development of the questionnaire was required before it would be suitable for this population due to poor internal consistency of the subscales. Differences in the participant inclusion criteria may explain the contrasting findings. Nicholls et al. (2013) included participants with a diagnosis of knee pain, hand osteoarthritis and chronic low back pain, whereas Kaptein et al. (2010) only recruited people with osteoarthritis.

### 3.5 Summary

The findings of this review indicate that people hold a range of different health, illness and treatment beliefs about osteoarthritis. Consideration of these studies suggested that most findings could be placed in one of five categories, which related to beliefs about the causes, consequences, treatment, emotional and psychological well-being, and support. A variety of methodologies, methods and measures were used to explore and quantify people's osteoarthritis beliefs, and these differences may have contributed to the range of beliefs identified in the review. Additionally, few studies were underpinned by an explicit theoretical model of health and illness perception, which may have also influenced findings. Therefore, before a survey of people's osteoarthritis beliefs can be carried out, a qualitative study should be completed to identify the health, illness and treatment beliefs of New Zealanders with hip and/or knee osteoarthritis, the results will then be used to inform the selection of suitable quantitative survey questionnaires.

## **Chapter 4 Review of literature relevant to clinicians' beliefs about the treatment of hip and knee joint osteoarthritis**

This chapter is a narrative review of literature associated with clinicians' beliefs about hip and knee osteoarthritis. The chapter commences with description of the search methods used to identify the literature that informed this narrative literature review. The next section describes commonly reported clinicians' osteoarthritis health, illness and treatment beliefs. Then the methods and measures employed to investigate these beliefs are discussed. The chapter concludes with an outline of the models of health, illness and treatment, and clinical practice approaches that act as frameworks for investigating these beliefs.

### **4.1.1 Literature search**

A comprehensive computerised literature search was undertaken of electronic databases including CINAHL Plus, SocINDEX, MEDLINE, SPORTDiscus, PsycINFO, and SCOPUS via EBSCO host on the 13<sup>th</sup> of March 2013. Search term selection was informed by key words from the research question. The terms were purposefully kept broad so that the search could include suitable studies that may not have been identified with more restrictive search terms. The following terms were used to construct the search: osteoarthritis\*, chronic illness\*, disease\*, musculoskeletal\*, belief\*, attitude\*, perception\*, treatment\*, model\*, biomedical, biopsychosocial, clinician\*, physician\*, and doctor\*.

The doctoral candidate first screened the titles of the identified studies to exclude duplicates and select studies that included the main concept of osteoarthritis health, illness and/or treatment beliefs held by clinicians. The candidate then read the abstracts of the selected studies and evaluated their appropriateness using the inclusion and exclusion criteria defined below (4.1.2 & 4.1.3). Abstracts that met any of the exclusion criteria were excluded from the study. When the abstract met the inclusion criteria, the full-text version was sourced and read. Additionally, reference lists of the included studies were manually screened for further suitable studies.

### **4.1.2 Inclusion criteria**

Studies were included in the narrative review if they were written in English; described health, illness and/or treatment beliefs; related to the management of people with osteoarthritis; and had the full text available.

### **4.1.3 Exclusion criteria**

Studies were excluded if they were not published in a peer-reviewed journal, or if they focused primarily on inflammatory forms of arthritis. Studies described in the grey literature (i.e. research reports not subjected to peer review, working papers or government documents and unpublished theses) were not included as they may not have been subjected to suitable peer review.

### **4.1.4 Search Returns**

Forty-seven articles met the inclusion criteria and informed the narrative literature review described in this chapter.

## **4.2 Clinicians' osteoarthritis beliefs**

The focus of the studies exploring clinicians' beliefs differed considerably from those exploring the beliefs of people with osteoarthritis as most studies concentrated on beliefs about treatment (Chapter 3). Additionally, the body of literature appeared to be smaller. Therefore, the findings are grouped and discussed in the following three categories; treatment beliefs, beliefs about clinical practice guidelines, and the difference between clinicians' and patients' beliefs.

### **4.2.1 Treatment beliefs**

Many of the identified studies explored clinicians' beliefs about the treatment of osteoarthritis. Study participants were primarily general practitioners, physiotherapists and orthopaedic surgeons. The clinicians' profession appears to affect their osteoarthritis treatment beliefs. For example, many surgeons view surgery as the most efficacious treatment for people with osteoarthritis, but less than 10% perceived merit in exercise-based therapy (Wright et al., 1995; Wright, Hawker, Bombardier, Croxford, & Dittas, 1999). However, there were considerable differences among surgeons about the

most appropriate surgical approach (Wright et al., 1995). Additionally, some authors suggest that surgeons' enthusiasm for a particular procedure is strongly influenced by where they trained and practised (Harris, 2016; Wright et al., 1999). Furthermore, Wright et al. (1999) implied that a surgeon's interest or preferences appreciably influenced the surgical treatment a patient received.

Exercise is regarded as a cornerstone of hip and knee osteoarthritis treatment (Bennell & Hinman, 2011; Fransen & McConnell, 2008). However, beliefs about the efficacy of exercise appear to be influenced by professional training. Poitras et al. (2010) found that physiotherapists appear to hold more positive beliefs regarding exercise-based therapy than general practitioners (GPs). However, Holden et al. (2009) found that only 56% of physiotherapists surveyed agreed that exercise was beneficial for people with osteoarthritis. In contrast, Prasanna et al. (2012) suggested that most therapists saw merit in exercise but believe that potential benefits of the treatment approach are limited by patients waiting too long before seeking help. A study of French GPs indicated the under-utilisation of non-pharmacological approaches was in part due to clinicians believing that exercise therapy was ineffectual for people with knee osteoarthritis (Chevalier et al., 2004). Also, Poitras et al. (2010) found that GPs tended to be ambivalent towards exercise-based therapy, with some participants indicating that they knew exercise was important but felt it was too challenging for their patients. Further research suggests that many GPs continue to advocate rest for patients with osteoarthritis of the knee, in contrast to recommended practice guidelines (Cottrell et al., 2010). Moreover, in studies of low back pain, clinicians with more biomedical beliefs or higher fear avoidance behaviour scores are more likely to disregard clinical management guidelines and advocate rest and activity avoidance (Bishop, Foster, Thomas, & Hay, 2008; Coudeyre et al., 2006; Darlow et al., 2012; Fullen, Baxter, Doody, Daly, & Hurley, 2011). No identified studies explored the effect of clinicians' osteoarthritis beliefs on their treatment prescription behaviours.

#### **4.2.2 Beliefs about professional and clinical practice guidelines**

Clinical practice guidelines are tools designed to direct clinicians to best practise approaches to care. Research indicates that most clinicians agree with osteoarthritis clinical practice guidelines and see merit in their use (Chevalier et al., 2004; Conrozier et al., 2008; Cottrell et al., 2010). Nonetheless, research suggests there is a gap between agreement with guidelines and the enactment of guidelines in practice (Hunter & Lo,

2009; Hunter et al., 2011). For example, clinical practice-based studies suggest that actual referral of people with osteoarthritis to exercise-therapy is poor, with referral rates in the United Kingdom ranging from 5 to 52% (Cottrell et al., 2010), from 9 to 15% in France (Chevalier et al., 2004), and under 6% in Australia (Brand et al., 2011). Barriers to the application of osteoarthritis clinical practice guidelines were fatalistic beliefs about osteoarthritis, ambivalence about the benefit of exercise and limited time with patients (Kingsbury & Conaghan, 2012; Poitras et al., 2010).

#### **4.2.3 Difference between clinicians' and people's osteoarthritis beliefs**

A small number of studies compared the osteoarthritis beliefs of clinicians and people with the disease. Research identified that differences in beliefs about appropriate treatment between patients and clinicians is associated with reduced patient satisfaction and treatment adherence (Sansom et al., 2010). Furthermore, findings suggest that clinicians tended to focus on the short and long term safety of a treatment option, whereas patients focused on symptom relief (Alami et al., 2011; Cordero-Ampuero et al., 2012). Additionally, other research indicates that some people believe clinicians act as technicians and spend too much time focusing on the affected joint and not the whole person (Cordero-Ampuero et al., 2012).

### **4.3 Methodological factors that may have influenced the findings**

Two methodological factors may explain some of the inconsistency in the literature about clinicians' osteoarthritis beliefs. These factors are the different professional affiliations of the participants included in the studies, and the variety of paradigms, methodologies and measures used to collect the data.

#### **4.3.1 Different professions of clinicians**

The professional qualification of the participants in each study may have influenced the reported beliefs. Research advocates for a multi-disciplinary team approach to the management of osteoarthritis (Jones et al., 2011). However, studies typically included participants from a single profession, and characteristically only included professions such as general practice, physiotherapy or orthopaedic surgery (Alami et al., 2011; Chevalier et al., 2004; Conrozier et al., 2008; Cottrell et al., 2010; Holden et al., 2009;

Larsson, Liljedahl, & Gard, 2010; Poitras et al., 2010; Wright et al., 1999). Therefore, the results may not reflect the beliefs and expectations held by all clinicians who manage people with osteoarthritis.

### **4.3.2 Different methodologies**

Both qualitative and quantitative methodologies have been used to investigate the phenomenon of clinicians' osteoarthritis beliefs. The different paradigms could have led to different findings, results or conclusions because each paradigm guides the focus of the study (Creswell & Plano Clark, 2011). Furthermore, a wide range of different data collection measures and analysis were used. The identified qualitative studies all used semi-structured interviews, but the particular approaches differed between studies. In two studies, data were collected by individual interviews at one time-point (Alami et al., 2011; Larsson et al., 2010), whereas in another study participant interviews were followed up at different time-points (Sansom et al., 2010). These repeated interviews enabled the researchers to explore how people's beliefs changed over time (Sansom et al., 2010). Some researchers elected to use focus groups to collect data, this method enabled participants to respond and discuss points that may not have been raised in an individual interview (Poitras et al., 2010; Prasanna et al., 2012). The qualitative studies of clinicians' beliefs predominantly used data analysis approaches with limited levels of interpretation, such as content or thematic analysis (Alami et al., 2011; Poitras et al., 2010; Prasanna et al., 2012; Sansom et al., 2010).

Cross-sectional surveys were the most frequently used method of quantitative data collection about clinicians' osteoarthritis beliefs. An exception was Wright et al. (1999), who collected retrospective data by inspecting surgeons' clinical practice records. A variety of different measures were used to collect data in the quantitative studies, including vignette based questionnaires, clinical behaviour questionnaires and expectation scales (Chevalier et al., 2004; Conrozier et al., 2008; Cordero-Ampuero et al., 2012). This diversity suggests there are no standard quantitative measures for the collection or analysis of clinicians' beliefs about the management of osteoarthritis.

No valid and reliable quantitative measure of clinicians' osteoarthritis beliefs was identified, but two questionnaires were identified that have been used to explore clinicians' beliefs about low back pain. The questionnaires are the Health Care Providers Pain and Relationship Scale (HC-PAIRS: Houben et al., 2004) and the Pain



Attitudes and Beliefs Scale for Physiotherapists (PABS-PT: Ostelo, Stomp-van den Berg, Vlaeyen, Wolters, & de Vet, 2003a). These questionnaires have the potential to be adapted for application in the context of osteoarthritis, and have undergone testing for internal consistency, reliability and validity (Bishop et al., 2008; Houben et al., 2004; Mutsaers et al., 2014; Ostelo et al., 2003a). Furthermore, the PABS-PT is underpinned by health beliefs models; the Biomedical and Biopsychosocial Models (Ostelo et al., 2003a).

Clinical vignettes can provide insights into a clinician's behaviour and beliefs. Two studies used clinical vignettes to explore clinicians' osteoarthritis-related beliefs and practice behaviours (Chevalier et al., 2004; Holden, Nicholls, Hay, & Foster, 2008). Holden et al. (2008) used a clinical vignette to survey physiotherapists about their use of therapeutic exercise for patients with knee osteoarthritis. The vignette included a questionnaire that elicits information about the treatment method(s) clinicians would use for the patient. Chevalier et al. (2004) used a vignette to compare GPs practice behaviours with best practice recommendations for knee osteoarthritis treatment. Clinical vignettes have two key limitations. Firstly, they are not exact measures of practice behaviour, and secondly, they can be susceptible to socially desirable response bias (Arber et al., 2004).

#### **4.4 Treatment and clinical practice models relevant to osteoarthritis care**

Two models of clinicians' beliefs (Biomedical and Biopsychosocial), and two clinical practice models (Patient-Centred Care and Interprofessional Collaborative Practice) were identified in the literature. Clinician-focused health, illness and treatment beliefs models are not conventionally used in research but are primarily frameworks used in Western medicine to guide clinical practice (Engel, 1978). These models are traditionally medically driven, i.e. the Biomedical and Biopsychosocial Models (Engel, 1977). However, due to limitations of these clinical beliefs models, clinical practice models have become prevalent as a method of guiding and changing clinicians' healthcare practice behaviours and beliefs.

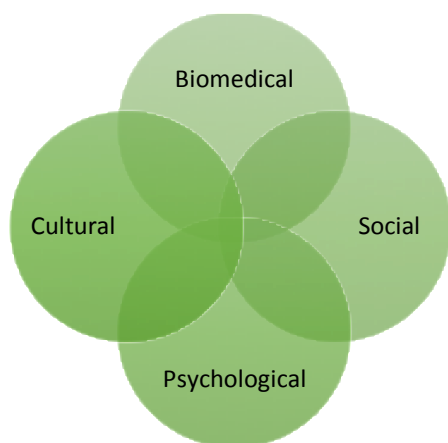
#### 4.4.1 The Biomedical Model

The Biomedical Model, also referred to as the Medical Model or the Western Model of Health, is better described as a collection of beliefs or perspectives than as an explicit model (Helman, 2007). In this model, it is assumed that disease can be fully accounted for by deviations from normal biology (Engel, 1977). It is a model of beliefs that informs clinicians' practice and is described as being informed by the following premises; a humanitarian outlook, scientific rationale, objective numerical measurement, mind-body dualism, the view of the disease as an entity, reductionism, and emphasis on the individual patient rather than the family or community (Helman, 2007). It is argued that the definition of health in the Biomedical Model, *the absence of disease*, has influenced clinical practice and led to the medicalisation of some aspects of life, such as ageing and childbirth (Helman, 2007). The Biomedical Model has facilitated considerable advances in the management of osteoarthritis, through improvements in drug and surgical treatment. However, researchers argue that much of the management of the condition occurs in primary care, where a more holistic interprofessional approach to patient management is required (Dziedzic, Hill, Porcheret, & Croft, 2009; Edwards et al., 2013).

#### 4.4.2 The Biopsychosocial Model

Engel (1977) proposed the Biopsychosocial Model in the 1970s as an acknowledgement that illness is not solely physical and includes psychological, cultural and social factors (*Figur*). Like the Biomedical Model, the Biopsychosocial Model is used to guide clinicians' practice (Borrell-Carrio et al., 2004). The application of this model is advocated for use in clinical practice with people with arthritis (Ryan & Carr, 2010). However, few studies have explored clinicians' beliefs in this context. Larsson et al. (2010) identified an association between biopsychosocial beliefs and biomedical beliefs, and clinical practice behaviours. The authors found when working with patients with osteoarthritis, physiotherapists who held more biopsychosocial beliefs tended to work more collaboratively with their patients, whereas those who held more of a biomedical or paternalistic view tended to lead or direct their patients into treatment (Larsson et al., 2010). However, these findings were extracted from participant interview transcripts and not measured quantitatively. No quantitative measure of clinicians' osteoarthritis beliefs was identified in the review. However, the PABS-PT is a health and illness

measure developed to assess clinicians' beliefs about low back pain and is designed to determine if clinicians' approach to treating people with LBP is informed more by biomedical or biopsychosocial (behavioural) beliefs (Ostelo et al., 2003a).



**Figure 6.** The Biopsychosocial model of healthcare (Adapted from Engel, 1977).

#### 4.4.3 Clinical practice models

Clinical practice models or approaches are used to inform and guide healthcare clinicians in their daily practice (Briggs, Towler, Speerin, & March, 2014). Therefore, these models are not commonly used to guide or underpin research. Two clinical practice models that have been discussed in the context of healthcare for people with osteoarthritis are called patient-centred care and interprofessional collaborative practice (Bain, Mierdel, & Thorne, 2012; Brand et al., 2011; Körner, 2010; Stoffer et al., 2015). The use of both clinical practice models is promoted in the management of people with osteoarthritis. However, no studies have formally tested either of the models in the context of osteoarthritis, but have instead assessed capabilities perceived to be present if clinicians practise with either of these two approaches (Webster et al., 2013; Westby & Backman, 2010).

##### 4.4.3.1 Patient-centred care

Patient-centred care, also referred to as person- or client-centred care, is promoted as an approach to clinical practice that places patients at the centre of their health care.

Researchers argue that patient-centred care in primary practice is multi-faceted (Little et al., 2001; Mead & Bower, 2000). The approach encompasses a biopsychosocial attitude to care, the view of a patient as a person, and promotes a therapeutic relationship between patient and clinician that is based on partnership, shared responsibility and health promotion (Little et al., 2001; Mead & Bower, 2000). Hunter et al. (2011) contended that the development of patient-centred healthcare services for people with osteoarthritis would lead to improvements in quality of care. Equally, it would improve uptake of best practice guidelines for osteoarthritis treatment (Hunter et al., 2011). However, this approach to care can be difficult to implement. Webster et al. (2013) recognised that some orthopaedic services using a patient-centred model of osteoarthritis care were not meeting the needs of their patients. While in-patient care was deemed appropriate, the patient-centred approach did not extend beyond this to include pre- and post-surgical management (Webster et al., 2013). These findings support concerns that patient-centred care is often enacted superficially and without a clear understanding of the needs and wants of the patients (Epstein & Street, 2011).

#### **4.4.3.2 Interprofessional collaborative practice**

Interprofessional collaborative practice (IPCP) is another clinical practice model that has been advocated as improving healthcare for people with chronic health conditions (Hall, 2005; Ross & Harris, 2005). IPCP was proposed as a possible tool for coping with future changes in healthcare need and funding in New Zealand (Nicholls, Reid, & Larmer, 2009). The World Health Organization defines IPCP as “*When multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, caregivers and communities to deliver the highest quality of care across settings.*” (World Health Organization, 2010: p7). Bain et al. (2012) argued that an IPCP approach to arthritis care can enhance cohesive clinical practice, communication, leadership, mutual goal setting, and patient-centered care. Brand and Cox (2006) claim that an IPCP approach to care leads to better communication between clinicians, and between clinicians and patients. Additionally, findings indicated that IPCP in orthopaedic care enhances the conservative treatment options offered to people with osteoarthritis (Aiken & McColl, 2008). Westby and Blackman (2010) found that poor interprofessional communication in osteoarthritis orthopaedic services led to service inefficiencies, duplication of services and patient dissatisfaction. Furthermore, professional cultures, specialisation and professional jargon are cited as barriers to an IPCP approach to treatment (Hall, 2005).

## 4.5 Summary

The findings of this review indicate that clinicians hold a range of different health, illness and treatment beliefs about osteoarthritis. In particular, the study findings suggest that clinicians' beliefs about treatment are inconsistent and can vary across professions and between clinicians. A range of different methods and measures have been employed to explore the phenomenon, and few of the studies describe the use of explicit theoretical models. Therefore, before a survey of clinicians' osteoarthritis beliefs can be conducted, a qualitative study should be completed to identify the osteoarthritis beliefs of New Zealand clinicians, the results of which will inform the selection of suitable quantitative survey questionnaires.

## **Chapter 5 Description and justification of the research design and approaches used**

This chapter describes the design and approaches used in this thesis and justifies the included methods. The chapter comprises of an overview of the mixed-methods methodology of the thesis, the qualitative descriptive methods, the systematic review methods, and the cross-sectional survey methods.

### **5.1 Mixed-methods research: Exploratory sequential design**

The overarching methodology of this thesis is mixed-methods. Mixed-methods research involves bringing together research methodologies from the qualitative and quantitative paradigms in a complementary way (Creswell & Plano Clark, 2011). More specifically, this thesis used an exploratory, sequential mixed-methods design. With an exploratory sequential design, the qualitative component of the study precedes the quantitative component. The design is named so because typically such studies explore a phenomenon where little is understood or where there is no acceptable quantitative measure available to test the phenomenon (Creswell & Plano Clark, 2011).

The aims of the thesis dictated the selection of this approach. Little was known about the health, illness and treatment beliefs of New Zealanders living with hip and/or knee osteoarthritis or the beliefs of clinicians who were commonly treating them. An understanding of the phenomenon was required before suitable quantitative measures could be selected. The qualitative descriptive studies enabled the identification of key themes relevant to New Zealanders living with the condition and to clinicians treating osteoarthritis. Then the two systematic literature reviews of relevant measures were completed. The results of the systematic reviews and the findings of the two qualitative studies informed the selection of questionnaires for the two cross-sectional observational survey-based studies (quantitative).

Mixed-methods research design is described as being born as a result of the paradigm wars of the 1970s and 1980s (Johnson & Onwuegbuzie, 2004; Johnson, Onwuegbuzie, & Turner, 2007). There is continued debate regarding which theoretical perspective best underpins mixed-methods research (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2011). Initially, the method was described as

purely pragmatic and devoid of an underpinning paradigm, a view still held by some (Feilzer, 2010). However, this belief has changed for many researchers. Some argue that the underpinning perspective should relate to the one best worldview that describes the theoretical perspective of the study (Creswell & Plano Clark, 2011). Others assert that paradigmatic dualism is acceptable and that paradigms do not need to be exclusive, meaning that both objectivism (quantitative) and constructivism (qualitative) can co-exist distinctively within a single study design (Johnson et al., 2007). Modern interpretations of post-positivism allow for paradigmatic dualism, meaning that the underpinning theoretical perspectives of both constructivism and objectivism can be combined while acknowledging the strengths and limitations of both philosophies (Doyle, Brady, & Byrne, 2009; Fletcher, 1996). It is this post-positivist notion of paradigmatic dualism that underpins the construction of the present thesis.

Furthermore, the mixed-methods design was selected because it utilises the strengths of each methodology to build a more robust study than could be realised using only one of the methodologies. Since the two methodologies come from diverse theoretical and philosophical perspectives, the resultant findings can be richer than those derived from a single philosophical base (Creswell & Plano Clark, 2011; McPherson & Kayes, 2012). Researchers have argued that qualitative research can complement, extend and guide quantitative research, as well as answer important questions in its own right (Creswell & Plano Clark, 2011; McPherson & Kayes, 2012; Wright-St Clair, Reid, Shaw, & Ramsbotham, 2014). The use of both methodologies means that the phenomena of people's and clinicians' osteoarthritis beliefs were addressed more broadly and with greater integrity than if only one approach was employed. Furthermore, the findings of the qualitative studies directly informed the selection of measures for the quantitative study. This step reduced the potential impact of bias caused by uninformed selection of the survey questionnaires.

## **5.2 Qualitative description**

The thesis contains two studies that use a qualitative descriptive methodology. The first study, described in Chapter 6, explores the health, illness and treatment beliefs of people living with hip and/or knee osteoarthritis in New Zealand. The second study, described in Chapter 9, explores the beliefs of clinicians who commonly treat these people. A qualitative approach was considered the best method of exploring health,

illness and treatment beliefs because it would provide a meaningful insight into the phenomenon. Furthermore, qualitative description was chosen as it is regarded as an appropriate qualitative methodology for mixed-method design because it does not include a large amount of interpretation, the methodology stays close to the data and does not require an extensive analysis process (Braun & Clark, 2006; Sandelowski, 2000).

Like most qualitative methodologies, qualitative description has its roots in constructivism. Therefore, unlike interpretive methodologies, qualitative descriptive research using thematic analysis avoids highly interpretive, abstract, and conceptual analysis. Instead, the methodology focuses on a description of the key issues and/or themes in the data (Braun & Clarke, 2006). The methodology has at times been described as a crude form of qualitative research because of the limited degree of interpretation and its reliance on description (Sandelowski, 2000). However, Sandelowski (2000) argues that understanding any phenomenon (or event or experience) requires, at the very least, knowing the truths about that phenomenon. She suggested that there are no facts outside the particular context that gives those facts meaning. Therefore, while qualitative descriptive research may not have the same abstract level of interpretation as other qualitative methodologies, it still requires an interpretation of the description (Sandelowski, 2000). Furthermore, it is acknowledged that researchers may place an interpretation on the data (Finlay & Ballinger, 2006).

### **5.3 Systematic literature review**

The thesis contains two systematic literature reviews. The first systematic review, described in Chapter 7, is a critical evaluation of questionnaires designed to measure people's osteoarthritis health, illness and treatment beliefs. The second, described in Chapter 10, is a critical evaluation of questionnaires designed to measure clinicians' osteoarthritis health, illness and treatment beliefs. The systematic literature review provides a rigorous, structured search and assessment of current literature as it relates to the particular subject area or research question (Portney & Watkins, 2009). This literature review method was used because it is an efficient way to gain insight into current evidence or best practice, especially in areas of research where large numbers of studies are published (Portney & Watkins, 2009).

It is common for a systematic literature review to utilise an appraisal tool or checklist to evaluate the research quality. The appraisal of methodological quality in the two



systematic literature reviews was undertaken with the use of the Consensus-based Standards for the Selection of Health Measurement Instruments checklist (COSMIN: Terwee et al., 2007). The COSMIN checklist was selected because it is a robust instrument for the evaluation of the methodological quality of measurement development and contains a rating system that allows the attributes of different measurements to be easily compared (Mokkink et al., 2010; Terwee et al., 2012). (Further description of the COSMIN is included in Chapter 7).

## 5.4 Cross-sectional survey

This thesis contains two cross-sectional observational studies in which questionnaires were used to collect data. The first study, described in Chapter 8, is a cross-sectional survey of New Zealanders' beliefs about health, illness and treatment of their hip and/or knee joint osteoarthritis. The second study, described in Chapter 11, is a cross-sectional survey of clinicians' beliefs about hip and knee joint osteoarthritis in New Zealand. Surveys are an effective way of exploring the current practices, beliefs, attitudes, values or characteristics of a certain group or population (Portney & Watkins, 2009). Additionally, surveys can be relatively simple and cost-effective to administer and allow for the collection of meaningful data from a large number of people (Carter, Lubinsky, & Domholdt, 2005; Kelley, Clark, Brown, & Sitzia, 2003).

Both surveys are located in the quantitative, post-positivist paradigm. The strengths of this form of research are that the results can be described as objective, reliable and reproducible, valid and generalizable (Krauss, 2005). Post-positivism acknowledges the limitations associated with traditional empiricism but still draws on the strengths of the positivist or empirical paradigm (Doyle et al., 2009). Scientific realism is an explanation of the post-positivist paradigm (Fletcher, 1996). Fletcher (1996) argues that scientific realism, as a form of post-positivism, is an appropriate paradigm in which to locate psychological research. Scientific realism acknowledges that complete objectivity is impossible and that all findings or truths are influenced by the context and method in which they are explored or created (Fletcher, 1996). People's health, illness and treatment belief systems are not created in a vacuum; they are affected by the culture and environment in which they live (Helman, 2007). Therefore, studies located in the post-positivist paradigm and informed by scientific realism are suitable for inclusion in mixed-methods research.

## **Chapter 6 An exploration of the osteoarthritis health, illness and treatment beliefs held by New Zealanders living with hip and/or knee osteoarthritis: A qualitative descriptive study**

### **6.1 Research questions**

The two research questions were:

- (i) What are the common osteoarthritis health, illness and treatment beliefs held by New Zealanders living with hip and/or knee osteoarthritis?
- (ii) Do these beliefs relate to an existing model or models of health, illness and treatment beliefs?

### **6.2 Methods**

#### **6.2.1 Study design**

This study was a naturalistic design using a qualitative descriptive methodology. Data were collected at one time-point by face-to-face interview and analysed by thematic analysis, as described by Braun and Clark (2006: Table 2).

#### **6.2.2 Participant selection**

People were recruited via purposive sampling from the general population of people living in Auckland, New Zealand (Patton, 2002; Portney & Watkins, 2009). People met the inclusion criteria if they had a clinical diagnosis of hip and/or knee joint osteoarthritis in keeping with the American College of Rheumatology guidelines. The American College of Rheumatology guidelines stipulate the person to have: (i) radiographic evidence of osteoarthritis changes, (ii) joint pain on most days of the last month, and (iii) three of the following: morning joint stiffness for longer than 30 minutes, crepitus, bony tenderness, bony enlargement and no palpable warmth at the joint (Altman, 1990). Participants were also required to have a good command of the English language to participate in the interview. All participants were required to provide written informed consent. People who were previous patients of the doctoral

candidate were excluded from the study. Three people initially expressed interest in participating in the study, but chose not to participate prior to data collection with no specific reason given.

### **6.2.3 Measures**

Data collection occurred by way of a short demographic and disease characteristics questionnaire and a face-to-face individual interview.

*Demographic and disease characteristics form.* Participants completed a demographic and disease characteristics form that included questions regarding age, joint affected, duration of symptoms, occupation, gender, and clinician(s) consulted about their osteoarthritis (Appendix A).

*Individual face-to-face interviews.* The interviews were conducted in a semi-structured conversational style, guided by the interview schedule. Interviews aimed to provide rich descriptive data by inviting discussion about particular events and moments of living with osteoarthritis. The interview schedule (Appendix B) was developed from literature about the treatment of osteoarthritis (Frankel et al., 2012; Fransen & McConnell, 2008; Toye et al., 2013; Toye, Barlow, Wright, & Lamb, 2006; Zhang et al., 2008). During the interview, participants were asked about living with and receiving treatment for their osteoarthritis, as well as the impact these events had on their understanding of, and beliefs about, osteoarthritis. However, questions were not limited to those included on the interview schedule. When appropriate, questions were asked about stories and notions presented by the participants, giving them the freedom to discuss potentially new issues or concepts.

### **6.2.4 Procedure**

The Auckland University of Technology Ethics Committee (AUTEC) granted ethical approval for the study (AUTEC approval number 12/101: Appendix C). The study was advertised to potential participants through the local arthritis support group newsletter and community education events. Those who were interested in participating, and met the inclusion and exclusion criteria, were enrolled. Initially, participants read the participant information form (Appendix D) and completed the consent form (Appendix E). Participants kept a copy of both forms. Next, they completed the demographic and disease characteristics form. Then interviews were conducted at a suitable location for

both the participant and doctoral candidate. The interviews were between 30 and 45 minutes in duration and digitally recorded. Six interviews were conducted at the participants' homes; the other six were completed in a meeting room located at Auckland University of Technology. Interviews were conducted between July 2012 and May 2014. Participant recruitment ceased when it appeared that subsequent interviews were not eliciting substantial new themes or notions.

### **6.2.5 Data processing**

Interview recordings were electronically transcribed verbatim by Transcribeme.com (California, USA), and checked for accuracy by the doctoral candidate. Participant confidentiality was maintained by removing all identifiable features from the transcripts.

### **6.2.6 Data analysis and preservation of rigour**

Data were extracted from the participants' demographic and disease characteristics forms, collated and presented descriptively. Following this, the doctoral candidate analysed the interview data following the steps described by Braun and Clark (2006: Table 2). Two supervisors (SB, VWSC) checked the data analysis. First, familiarity with the data was established, followed by code generation and data coding, and synthesis of themes. The doctoral candidate presented the thematic framework to his supervisors (SB, VWSC, RS) for review, discussion and refinement. Evidence supporting the identified themes came from the verbatim quotation of the raw data. Extended quotations were retained to maintain context, but grammatical errors were corrected to improve readability (Pitchforth, Porter, Teijlingen, & Keenan, 2005).

**Table 2.***Six Step Thematic Data Analysis Process (Adapted from Braun and Clark, 2006)*

	Steps	Description of the process
1	Building familiarity with the data	Data transcription, proof-reading transcriptions and removal of identifying features, and drafting potential codes.
2	Initial code generation	Development of the codes and systematic coding of all data.
3	Looking for themes	Review of the collective codes, grouping codes that make conceptual thematic sense, development of potential theme and subthemes from the grouped codes.
4	Refining the themes	Compare developed themes with the initial coded data (quotations).
5	Naming themes	Development of clear names for each theme that reflect the overall story of the theme and development of the thematic framework.
6	Constructing the report	Drafting and refinement of the thesis chapter, including the selection of the illustrative quotes and discussion of the findings in the context of existing literature.

### 6.2.7 Application of the principles of trustworthiness and rigour

Qualitative descriptive studies typically include a number of characteristics in their design to ensure credibility, transferability, dependability, and confirmability of the findings (Lincoln, 1995). These factors enhance the overall trustworthiness of the research (Sandelowski, 2000).

*Credibility* assesses to what extent the study is exploring the phenomenon of interest (Lincoln, 1995). Four steps were embedded in the design and implementation of this study to enhance credibility (Braun & Clarke, 2006; Kahlke, 2014; Sandelowski, 2000). One, the design of the study followed a well-established, clearly structured, research method and data analysis process (Braun & Clarke, 2006; Sandelowski, 2000). Two, in preparation for the study, the doctoral candidate completed a qualitative research methods paper (module) to develop his skills and knowledge in qualitative research methods, reviewed existing qualitative osteoarthritis research, and undertook a structure reflective process that explored and exposed his own beliefs and preconceived notions about the treatment of osteoarthritis in New Zealand (Appendix F: Presupposition interview). Three, all data were collected in an environment that facilitated open, honest conversation with the participants and in an iterative manner that allowed the

exploration of new views, opinions and beliefs. Four, regular debriefing sessions occurred with supervisors, which included scrutiny of the data collection and analysis processes, and the associated findings.

*Transferability* refers to the ability to take the findings of a qualitative study and apply them in a different context or to a different population (Lincoln, 1995; Shenton, 2004). The following process was employed to enhance the transferability of the findings from this study. A clear explanation of the parameters and methods of the study was provided so that findings could be located in the context and environment that the data were collected and analysed. This included a clear description of the participants, their lived contexts, the naturalistic setting, the data collection methods, the length and location of the interviews, as well as the manner in which the data were analysed.

*Dependability* implies that, should a study be repeated using the same methods with similar participants, the results or findings would be similar to those of the initial study (Portney & Watkins, 2009). The dependability of the findings was enhanced by the provision of a clear description of the methodology and study implementation, and by engaging in regular discussion and scrutiny with the supervisors.

*Confirmability* is the process that ensures that the presented findings are the thoughts, beliefs and opinions of the participants and not those of the researcher (Tobin & Begley, 2004). Two steps were taken to ensure the confirmability of the findings. First, to facilitate transparency, the doctoral candidate participated in a presuppositions interview (Appendix F). Second, long verbatim participant quotations were used when presenting data, to illustrate how the raw data informed the analysis and to prevent the data being removed from the context in which they were located.

## **6.3 Findings**

### **6.3.1 Participant characteristics**

Twelve people aged 33 to 82 years (mean = 58; SD = 14) with osteoarthritis of their hip and/or knee joints were enrolled in the study. Seven women and five men participated in the study. Individual participant's demographic and disease characteristics are presented in Table 3. Participants came from a range of occupational backgrounds, many had consulted with numerous health professionals concerning their osteoarthritis, and symptom duration ranged from three months to 20 years (mean = 60 months; SD = 75

months). Three additional people initially indicated that they wanted to participate in the study but elected not to participate before data collection with no reason given.

**Table 3.***Participant Demographic and Disease Characteristics*

Participant Number	Age (Years)	Gender	Occupation	Highest Qualification	Time Since Diagnosis (Months)	Joints Affected	Clinicians Consulted	Joint Replacement Surgery
1	51	M	Manager	HSC	36	Feet, knees, hips, neck	GP	No
2	33	F	Photographer	Bachelor's Degree	15	Hips	Surgeon, GP, physio, personal trainer	No
3	53	M	Doctor	PhD.	24	Hips	GP, surgeons (x4)	Yes (hip)
4	59	F	Full-Time Carer	Bachelor's Degree	204	Knees	GP, surgeon, physio, personal trainer	No
5	63	F	Office Administrator	Trade Certificate	10	Knee	GP, physio, orthopaedic surgeon, sports doctor, podiatrist	No
6	67	F	Retired	HSC	18	Knees	GP	No
7	59	M	Beneficiary	Trade Certificate	60	Hips, knee, shoulders	GP, chiropractor, physio, rheumatologist, orthopaedic surgeon	Yes (hips)
8	82	F	Retired	HSC	240	Knees, hands	GP, radiologist	No
9	78	M	Retired - Police	HSC	48	Knees, ankles	GP, physio, orthopaedic surgeon, trainer	Yes (knee and ankle)
10	49	M	Coaching Co-Ordinator	Tertiary Certificate	60	Knee	GP, surgeon, physio, gym instructor	No
11	66	F	Administrator	Bachelor's Degree	6	Thumb, knee	GP	No
12	35	F	Researcher	PhD	3	Hip	GP, sports physician	No

Note: Standard Deviation = SD, M = Male, F = Female, GP = General Practitioner, physio = Physiotherapist, HSC = Higher School Certificate, PhD = Doctor of Philosophy.



### 6.3.2 Interview findings

Four themes were identified in the data; each theme was comprised of interconnected notions. These themes were named: (i) *Knowing the cause but not the consequence*; (ii) *Explaining treatment beliefs*; (iii) *Understanding the importance of clear collaborative care*; and (iv) *Meaning more than just the joint*.

#### 6.3.2.1 Theme 1: *Knowing the cause but not the consequence*

This theme incorporates beliefs participants shared about the causes of their osteoarthritis and their expectations regarding progression of the disease. Participants primarily discussed causes that included familial or hereditary influences, ageing, injury and/or previous occupation. Additionally, most participants believed that their symptoms would progressively worsen.

All 12 participants discussed beliefs regarding the cause of their osteoarthritis. Many of the participants believed there to be a familial link or cause to their osteoarthritis, often citing parents or family members who also had the disease. *'I remember saying to the GP [General Practitioner], quite a few years prior to being diagnosed, "I've got a sore hip. Do you think that's anything to do with arthritis? Mum had arthritis" (participant 1).*

Participants also cited age or ageing as a cause of osteoarthritis. This belief appeared to cause younger participants feelings of distress when diagnosed with the condition. *'If I got it [osteoarthritis] when I was sixty, I would have said: "Oh yeah that's ok, that's part of getting old." Because I was in my late forties, I was so disappointed' (participant 1).*

*I think the pain started when I was walking down steps. The pain was like when you do too much of something. I had to go to the doctor for some other reason, but I mentioned the knees. He sent me for an X-ray and then said: "I think you've got a touch of arthritis". He didn't suggest to me to do anything for it. I didn't really think it was a big problem, just part of getting on I guess (participant 8).*

Previous injury or activity was cited by participants as possible causes for their osteoarthritis. Some referred to injuries that directly related to the start of their symptoms, whereas others talked about events that occurred many years prior to symptom onset.

*'About 17 years ago I broke my leg and my ankle. I got no proper treatment afterwards... I*

*think that was the start of osteoarthritis'* (participant 4). Few participants cited causes of the condition that differed from those commonly accepted for osteoarthritis. One example was participant 3 who stated:

*My perception is arthritis is lots of crystals in your joint and if you move the joint more it's going to make it worse. So that is my perception, that exercise is going to make it worse, especially weight-bearing exercise. It has got to make it worse* (participant 3).

When asked what the future held for them regarding their osteoarthritis, a number of participants stated that they expected their symptoms to deteriorate and/or spread to other joints. *'I can't see it getting better [laughing]'* (participant 1). *'I'm assuming once I've got it here, I'm likely to get it somewhere else. I thought that's what happened - that you got it in more than one place'* (participant 11).

#### **6.3.2.2 Theme 2: Explaining treatment beliefs**

Participants spoke in great depth about a number of different forms of treatment they had experienced or held beliefs about. Collectively, the participants presented robust understandings of the potential treatment options that were available to them. However, most indicated that they wanted to know about how, when and where they could engage in such treatment options. For clarity, the treatment options reported by participants are grouped into beliefs regarding exercise and movement, surgery, and other treatments. Other treatments discussed included dietary changes, weight loss and medication.

*Movement and exercise.* A large number of beliefs were conveyed about exercise and movement. Many of the beliefs expressed about movement and exercise were similar across participants. The majority of participants identified that exercise was good for their osteoarthritis and expressed beliefs about feeling better for having exercised despite at times finding it an imposition or painful.

*What does work for me is exercises where I can keep the knee tracking in a straight line as much as possible. The ones that have worked well for me in the past are walking, cycling and rowing on the rowing machine* (participant 10).

*'If I do it [exercise], it seems to me that my muscles loosen up, so I don't know if it is good, but it feels like it is doing the joint good'* (participant 2).

Some participants indicated that they were not confident that what they were doing was good for their joints because they had no guidance about exercise and had employed a trial and error approach.

*I manage it by not moving my leg out to the side or hyperextending. Just not doing stuff that I know will hurt... I don't know if that's a good or a bad thing. I would have liked some advice about that... (participant 3).*

While some participants held strong beliefs about the benefit of exercise, they also described their concern that movement could be painful or cause damage to their joints. Furthermore, participants cited pain as a barrier to exercising. *'The reason why I haven't done more activity than I have with my hips is that I've been fearful that [exercise] would actually be perpetuating or worsening the disease'* (participant 3). *'It is very difficult in my situation to get the motivation to exercise because most of the stuff I do is painful'* (participant 7).

Participants discussed how living with osteoarthritis had changed the way they engaged in sport and exercise. The following quotations illustrate two very different approaches to this, one participant describes being guarded and cautious, whereas the second is almost impetuous regarding exercise. *'Almost overnight I stopped a lot of the sport that I was playing, what I don't like now is knowing that I probably could and should have gone on a bit longer'* (participant 1). *'It's like, you're away, and some of your friends are going out for a run, and you're like "What, so I'm going to miss out? No. I'm going!"'* (participant 12).

**Surgery.** Participants discussed many beliefs concerning surgery for their osteoarthritis. A number of participants felt surgery was an inevitable consequence of having osteoarthritis. However, in contrast to this view, the majority of them wanted to avoid it at all costs and were very keen to look for alternatives.

*I think I've seen it [surgery] as inevitable one day. I don't see my arthritis ever getting better, I can only see it getting worse. But I want that day to be as far down the track as I possibly can make it (participant 10).*

*'I had to do something to avoid surgery because that was the last thing I wanted, so I told him [the surgeon] that I was going to the gym and I went' (participant 4).*

Some people saw surgery as a solution, believing it would fix their problems. Whereas others viewed surgery more negatively and were concerned about potentially poor outcomes. *‘Why did I go for operation number three on my knee? I wanted to have a solution to the knee problem is probably the answer. For me, it felt like an operation would be a solution’* (participant 10).

*I've heard about negative outcomes after surgery from friends. People who can't straighten their leg or they can't bend it properly after the operation. Or they can only bend it to a certain degree and no further, and they hobble around. Some still have problems, even a year after surgery* (participant 5).

Participants also expressed confusion as to when surgery was appropriate or needed.

*I did kind of wonder “what is the pain threshold and how long do I wait before surgery?” Because there have been a couple of days where I was in tears. I was crying, and I was thinking, how bad must it be for people, just before their ops?* (participant 2).

*Other treatments.* Discussion about other treatment modalities, dietary changes, weight loss, and medication, occurred with some participants. However, this happened much less frequently than conversations about exercise and surgery.

A number of participants described using their diet as a tool for managing osteoarthritis. They referred to two ways that they believed diet could impact their osteoarthritis. Firstly, participants spoke about wishing to be advised about foods or supplements that could aggravate or alleviate their symptoms.

*I would have liked my doctor or somebody to say, "Go talk to a nutritionist about osteoarthritis." It's something I'm interested in, and I think it would have helped right at the beginning if they had said, "You've got to get your body out of an acid situation and into an alkaline one." If someone had said “Here's an outline of a diet you could try, cut out this and cut out that” that would have been helpful* (participant 5).

Secondly, participants described their perceived connections between increasing body weight, diet, osteoarthritis and exercise. One participant described how having osteoarthritis had resulted in weight gain.

*The immediate effect of not exercising was weight gain because I used to eat like a horse and still do sometimes. While I have only put on about three*

*or four kilograms, I think there is a lot of transference of muscle to fat. It has taken me a long time to get my head around changing my diet. I am really only now trying to do something about it (participant 1).*

A few participants talked about their beliefs regarding the use of prescription medication to manage the osteoarthritis-related pain. They discussed concerns about possible long-term side effects or the potential masking effects of analgesic drugs.

*I know long-term it's not very good to take pills all the time, but the doctor says "don't worry about it". I really need them; I feel a difference if I don't take them. One or two days is okay, but if I'm off them for a week, I really feel like I've been run over by a bus (participant 7).*

*I don't want to take drugs all the time for the pain, so the only time I take drugs now is before I play a sport. I take anti-inflammatory drugs if I am going to play tennis because otherwise, I will not make it through the game, but I worry this might be doing more harm to the joint (participant 1).*

Conversely, some participants viewed medication positively and explained that receiving ample information from clinicians about how to take medications for their osteoarthritis made them feel happier about taking pills.

*I have an inbuilt resistance to taking too many pills. I don't want to be a druggie. But the physiotherapist said, "Well if you take these painkilling pills, there's a chance that instead of walking poorly, you'll walk more normally. That will allow the muscles to strengthen properly." That made sense to me, so now I do take pain killers when I need them (participant 9).*

### **6.3.2.3 Theme 3: Understanding the importance of clear collaborative care**

Participants described their interactions with healthcare professionals from various disciplines, for their osteoarthritis. Participants reported interactions ranging from very positive and informative, to those perceived as unhelpful or even potentially harmful.

Participants who described positive interactions indicated that during these exchanges they felt listened to and informed. Consequently, these people felt that they were a collaborative partner in the management plan.

*My GP at the time, he was wonderful. I had an MRI [magnetic resonance imaging], and he said the results were not good but agreed with me that we would try other alternatives to surgery. I am 20 years later without surgery. More recently, I have seen a surgeon at the local hospital. He encouraged*

*me to join the gym and said he would monitor my progress. Hard work, painful work, but I have a trainer who understood my condition because he had knee trouble too, this is great. The surgeon is pleased with how it is going and still keen to avoid surgery (participant 4).*

In contrast, some participants raised concerns about the amount of information and education they received from healthcare professionals. *‘The doctor hasn’t told me anything really useful. The things [I know] I have picked up from here and there. Keep the knee moving, that is probably the most useful advice I’ve picked up’ (participant 7).* *‘The surgeon did say to me not to play soccer with the kids anymore, but I don’t know why. Why not?’ (participant 3).*

*I would have liked my GP to have a chat to me, to ask “What are you doing at the moment? What are the stresses that you are placing on your joints?” And talk about some of the other physical activities or sports that I could do that won’t damage my joints (participant 1).*

Additionally, some participants indicated that they would have appreciated a referral to health practitioners who specialised in the management of osteoarthritis.

*I would have liked my GP to give me more information about osteoarthritis? Definitely. I should have tried to find a physiotherapist who knew about it. I just went to a general physiotherapist, and that was not very useful (participant 5).*

Several participants described receiving conflicting information about the best form of management for their osteoarthritis, noticeably this occurred most for surgical management, for example;

*Each orthopaedic surgeon that I’ve seen seemed to have an axe to grind. They had a view on things like this is the best joint replacement, or you don’t want to do this you want to have that. Having seen four different surgeons, I think that it’s potluck what [surgery] you get offered (participant 3).*

#### **6.3.2.4 Theme 4: Meaning more than just the joint**

The fourth theme comprised notions about how living with osteoarthritis, affected more than just the participants’ joints. Participants described how the disease affected different facets of their life beyond the physical limitations, including social interactions and

psychological well-being. Several emotions were linked to living with osteoarthritis; many participants described feeling both fearful and depressed.

*Well, the first feeling was panic really because first I had the hip pain and then the diagnosis of osteoarthritis. I was thinking, "God, if it's going to be like this all the time I'm going to have to give up work. I can't be limping around like this" (participant 12).*

*Around the time I was getting bad symptoms, how did I feel? I became quite depressed actually. I've spoken to a number of my friends, my mates in Australia who I work with doing my research, and they commented on how even in my emails my personality had changed (participant 3).*

Some participants said that living with osteoarthritis left them feeling frustrated and angry.

*'Frustrating, it can be hell. Especially when you are a caregiver for someone else, and you've got to do a lot of movement. Having osteoarthritis was frustrating from day one, and sometimes I get angry about it (participant 4).*

Many of the participants described how living with osteoarthritis had impacted on their ability to participate in daily activities. For some, it affected their ability to work in paid employment, for others their ability to engage in social or recreational activities.

*The GP wrote me a nice letter saying: "To whom it may concern, that I'm not to do any jobs which require any standing on my feet for a period of time or walking". That's why I've got my permanent disability stamp from the doctors for WINZ [Work and Income New Zealand]. Now I'm on the Supported Living Payment. I used to be on the Unemployment Benefit with a sickness exemption, but now I've basically retired early (participant 7).*

*Things worry me, like travelling and walking around old towns with cobbled streets. I couldn't do that at the moment because I don't think I could cope with the uneven ground. A couple of years ago I could have. I did. But now, I would be afraid to do that. Now even on a wet day when I'm walking around the block at home, I worry about hurting the knee (participant 5).*

Participants described how living with osteoarthritis meant that they now needed support from others or that they could no longer provide support to other people, such as family members. The benefit of receiving support from family is explained by the following statement;

*I'd say you'll have your negative days, you will, but try and get someone to give you oomph. My sister who's down the road does this for me. She'll say, "let's go out shopping" and we'll shop 'til we drop. If I say "my knee is getting sore", because she is aware of my condition, she'll say "let's go and have a cup of coffee", and I'll sit with my green tea and give the joint a rest (participant 4).*

For others, having osteoarthritis altered the role they traditionally played in their family group, which corresponded with a change in the dynamic of the whole family.

*The kids had a rough time first of all because of the pain and my tiredness. I became very bitey (sic) and cross, they had to adapt to their dad not being involved in sporting stuff. I was often the oil that worked the machine at home, and without being able to oil the machine, there were a lot more fights between the kids. I couldn't go out and kick the ball with them. I couldn't do anything like that which is non-confrontational and just fun with my kids (participant 3).*

## 6.4 Discussion

Study participants held a broad range of beliefs about living with hip and/or knee osteoarthritis. These findings were grouped into four key themes that related to beliefs about: (i) the causes and consequences of living with osteoarthritis, (ii) the treatments that participants employed to regulate their osteoarthritis, (iii) the impact of interacting with healthcare professionals for their osteoarthritis, and (iv) osteoarthritis affecting more than just their joints. Beyond these four main findings, there are a number of points that merit further discussion in the context of this thesis. For clarity, these points will be discussed theme by theme, and then collectively as they relate to existing models of health, illness and treatment beliefs.

### 6.4.1 Theme 1: *Knowing the cause but not the consequence*

Overall, the participants indicated beliefs they held about the common causes, expected progression and consequences of osteoarthritis. Participants primarily cited joint wear and tear, hereditary influences, increasing age, previous injury and increased body weight as causes for their osteoarthritis, all of which are known risk factors for the disease (Appelt et al., 2007; Kao & Tsai, 2012; Turner & Turner, 2007). Consistent with findings elsewhere, most participants expected that, as their joints deteriorated, their symptoms would



progressively increase (Dwek, McBain, Cleanthous, Shipley, & Newman, 2015; Hall et al., 2008; Suarez-Almazor, Richardson, Kroll, & Sharf, 2010; Toye et al., 2006). This conceptual association between symptoms and disease progression may be explained by a biomechanical view of osteoarthritis, where the pathology is viewed as one of purely joint wear and tear (Dziedzic et al., 2009; Hunter, McDougall, & Keefe, 2008). Furthermore, this view has been associated with the lay ‘body-as-a-machine’ health and illness belief model (Morden et al., 2011).

#### **6.4.2 Theme 2: *Explaining treatment beliefs***

Participants discussed exploring ways of regulating or treating their osteoarthritis, with a particular focus on exercise and movement, and surgery. Similar to existing research findings, most participants viewed exercise and movement as good for their osteoarthritis (Holden et al., 2012; Morden et al., 2011). This is highlighted by participant 10 who specified that exercise was the treatment that genuinely made a difference to his symptoms. In contrast, a few participants did hold fears that movement and exercise would lead to increased joint damage. Again such beliefs are congruent with a biomechanical view of osteoarthritis; as in the model, increases in joint load are associated with increases in joint wear and related symptoms (Johnson & Hunter, 2014). Some participants cited discontinuing or believing they should discontinue sporting activities because of their osteoarthritis, despite research showing that participation in sports and exercise has small to moderate benefits effects on function, pain and quality of life in people with osteoarthritis (Bennell & Hinman, 2011; Fransen et al., 2015). However, this belief appeared to be driven by a lack of knowledge about what exercises should be undertaken, rather than the belief that exercise would further damage the joint.

Very few participants viewed surgery as something that would fix their joint and most wanted to avoid it if possible. This view contrasts with other research where some see surgery as a cure for osteoarthritis (Gustafsson et al., 2010; McHugh et al., 2007). However, many still saw surgical joint replacement as inevitable, or the best intervention for the long-term management of their osteoarthritis. This belief about the inevitability of surgery may be rooted in the ‘spare parts’ model of illness perception, or the idea that

faulty parts of the body need to be replaced when worn out (Hellman, 2007). In particular, total joint replacement surgery has popularised this view of the body (Harris, 2016).

From a rehabilitation practitioner's perspective, one concerning finding was the inconsistent advice participants reported receiving about the appropriate time to have surgery and the most suitable surgical management. This finding is not novel and has been reported elsewhere (Harris, 2016; Smythe & White, 2017; Wright et al., 1999). These authors indicate that both the popularity of surgical techniques with clinicians, and patients pressing clinicians for surgery led to significant increases in surgery rates for people with osteoarthritis (Harris, 2016; Smythe & White, 2017; Wright et al., 1999).

The majority of the time that participants used to talk about osteoarthritis treatment was spent discussing exercise and surgery, few other treatments were mentioned. Most research on the conservative management of osteoarthritis focuses on exercise-based therapies (Bennell, 2013; Bennell & Hinman, 2011; Brand et al., 2014; Clarson et al., 2013; Zhang et al., 2008). However, other forms of treatment are known to be beneficial for people with hip or knee osteoarthritis including: cryotherapy, manual or manipulative therapy, joint supports or braces, mobility aids (walking stick) and orthotics (Bennell, 2013; Fitzgerald et al., 2016; Hochberg, Silman, Smolen, Weinblatt, & Weisman, 2015). Participants in this study may not have been aware of these additional treatment strategies, or they may perceive these strategies to be of little or no benefit. Previous research has shown that some people see little benefit in the conservative treatment, or see it as something that is too challenging to incorporate into their lives, some even regard it as something that you do while waiting for surgery (Campbell et al., 2001). Furthermore, the predominant focus of osteoarthritis treatment and research on exercise and surgery may mean that alternative treatments are not promoted or valued. No participants referred to the use of dietary supplements, despite their use being common (Dean & Gormsen Hansen, 2012). This finding may be due to the focus of the interview schedule or the simply the beliefs of those who participated in the study.

#### ***6.4.3 Theme 3: Understanding the importance of clear collaborative care***

For all participants, consultation with a healthcare practitioner involved more than simply receiving information about the disease and possible treatment options. These interactions

affected their own ability to engage with the management of their osteoarthritis. Some described interactions that left them feeling informed and they associated this feeling with the belief that they were listened to, that the information they received had been tailored for them, and that they had a treatment plan to follow. It seems that these interactions improved the confidence participants had in managing their osteoarthritis. Researchers advocate that these approaches can enhance patient engagement and treatment adherence (Bennell, Dobson, & Hinman, 2014).

Conversely, some stated that they did not have a cohesive management plan and that their self-management was largely constructed without direction, using information collected from multiple sources. Participants described these experiences as frustrating, and many indicated that clear guidance or direction would have been helpful. Other research has explored the interaction between people living with chronic musculoskeletal pain and health services, concluding that many patients feel they struggle to negotiate the health service (Parsons, Godfrey, & Jester, 2009; Smythe & White, 2017; Toye et al., 2013). Furthermore, these findings are somewhat mirrored by the results of the study by Brand, Ackerman, Bohensky, and Bennell (2013), who investigated patients' osteoarthritis treatment beliefs in Australia. This study found people living with osteoarthritis felt that there was a poor cohesion of health services, health professionals demonstrated a limited understanding of their condition, and there was poor interprofessional communication between clinicians (Brand et al., 2013).

Additionally, many participants described receiving conflicting information about treatment, specifically surgical treatment. This appeared to affect their beliefs regarding the effectiveness of the proposed treatment. This was articulated by participant 3 who described his experiences of being offered different surgical treatments from different surgeons for the same problem. Inconsistencies or conflicts in patient education or treatment advice have been shown to impact a patient's confidence in the treatment and reduce adherence (Carpenter et al., 2010; Smythe & White, 2017). These findings may be explained by the research of Harris (2016), who argues that surgical practice is notably influenced by a surgeon's professional experience, competency and preferences. Therefore, the practice can differ significantly between surgeons. This notion is supported by the

findings of Smythe and White (2017), who highlighted differences in surgical criteria between surgeons for people with hip joint osteoarthritis.

#### **6.4.4 Theme four: *Meaning more than just the joint***

Several participants described having osteoarthritis means more than just having a problem with your joints. They explained the presence of osteoarthritis in their lives negatively impacted their emotional well-being, and their ability to participate in social and occupational activities. Participants referred to osteoarthritis leading to feelings of fear, anxiety, frustration and even anger. Such findings are not new and are extensively supported by existing research (Brand et al., 2014; Elizabeth & Rena, 2011; Hawker, Gignac, et al., 2011; Lane et al., 2011). In particular, research has linked living with osteoarthritis to raised levels of fear (Gustafsson et al., 2010; Suarez-Almazor et al., 2010), anxiety and depression (Ballantyne et al., 2007; Sharma et al., 2016), and vulnerability (Smythe et al., 2012). Additionally, living with osteoarthritis is known to lead to the development of barriers to social and occupational participation (Baird et al., 2007; Gignac, Cao, Lacaille, Anis, & Badley, 2008; Machado, Gignac, & Badley, 2008). Often these barriers are linked to physical limitations, such as poor mobility or functional impairment. Participants also indicated that living with osteoarthritis impacted on their ability to interact with others, such as family members. This altered the way they saw themselves and how they perceived they were viewed by others. Ballantyne et al. (2007) described the how people with osteoarthritis often experience a sense of identity change as an impact of living with the disease. These findings indicate the participants held more complex beliefs about osteoarthritis than could be explained by purely biomechanical or biomedical models.

#### **6.4.5 Health and illness belief models that relate to the findings of the current study**

Some participants held beliefs about osteoarthritis and associated treatment that appear to be underpinned by a biomechanical view of the disease. This was evident from a number of their comments, such as when Participant 3 stated his belief that movement was only going to make things worse. In accordance with this view, and with specific reference to joint surgery, it appeared that participants were also employing other associated lay health and

illness belief models such as the ‘Body as a Machine’ or the ‘Spare-Parts’ models (Helman, 2007; Morden et al., 2011). For example, when participant 10 referred to surgery as the ‘*solution*’ to his knee problem or the several participants who felt that joint replacement surgery was inevitable. These lay biomechanical-based models of osteoarthritis beliefs have previously been linked to people’s conceptualisation of osteoarthritis (Hunter, 2011; Hunter et al., 2008).

However, the findings of this study indicate that some participants also held beliefs not entirely explained by a biomechanical view of the disease. This is highlighted by the impact that osteoarthritis appeared to have on participants’ psychological and social well-being. This more complex representation of osteoarthritis fits better into a multifaceted, more comprehensive model of health and illness, such as the Common Sense Model (CSM: Leventhal, Weinman, Leventhal, & Phillips, 2008). The CSM has previously been used to inform osteoarthritis-based health beliefs research (Bijsterbosch et al., 2009; Kaptein et al., 2010). While the model does acknowledge biomedical beliefs about illness, it also recognises emotional and social beliefs (Leventhal et al., 2008). Yet, the CSM does not explain one theme presented in the findings of this study. Some of the notions within the theme titled *Understanding the importance of clear collaborative care*, appear to be unique to this study and are not easily explained by any existing model of health and illness previously applied to osteoarthritis.

#### **6.4.6 Strengths and limitations**

The study had two strengths. One, the use of purposive sampling meant that participants were selected who had a broad range of different demographic and disease characteristics. Therefore, they represented a range of different people who live with osteoarthritis in New Zealand. This method of sampling is believed to facilitate the selection of information-rich cases for the most efficient use of resources and to provide a diverse view of the phenomena under exploration (Palinkas et al., 2015; Patton, 2002). Two, the selection and application of an existing, well-structured qualitative research methodology. Using a qualitative methodology allowed for a rigorous, in-depth exploration of the phenomena of interest (Corbin & Straus, 2008; Sandelowski, 2000). Furthermore, the use of the thematic

analysis methods defined by Braun and Clark (2006), resulted in a robust, reproducible analysis.

The study had three limitations. One, the mean age of participants was 58 years (SD 14 years), which is young when compared with mean ages in other studies (72 years: Hampson, Glasgow, & Zeiss, 1994; 64 years: Kroll, Richardson, Sharf, & Suarez-Almazor, 2007; 64 years: Suarez-Almazor et al., 2010). It is feasible that being younger on average, the people in this study were more inclined to avoid surgery and medication, and look for other management options (Ballantyne et al., 2007). Two, the promotion methods and geographical constraints of the study may have impacted upon the findings. The study was primarily advertised through Arthritis New Zealand. Therefore, participants were likely to be members of the organisation and may have been better informed than people who are not members of this group. Additionally, only people with whom the doctoral candidate could meet participated as the interviews were conducted face-to-face in Auckland. Therefore, the beliefs may not be reflective of those from people living in more rural areas of the country. Three, ethical limitations mean that data were only collected from people who volunteered for the study. It may be that these people held beliefs regarding osteoarthritis that differ from those who chose not to participate.

## **6.5 Summary and recommendations**

In summary, the findings of this study illustrate the complexity of beliefs people hold about what it means to live with hip and/or knee osteoarthritis. Many of the beliefs identified are similar to those described in existing research. However, this appears to be the first study in this area to be conducted in New Zealand using a qualitative descriptive methodology. Many aspects of the identified themes share commonalities with the constructs of the CSM and could, therefore, be assessed by a questionnaire(s) underpinned by this model. One unique finding was identified, which related to the influence of clinical interactions on the participants. These interactions appeared to have either, a very positive or very negative effect on the participant's beliefs about osteoarthritis. The findings of the present study reflect the beliefs of a small sample of New Zealanders with hip and/or knee joint osteoarthritis. Therefore, a quantitative survey-based study is needed to identify if these findings are reflective of the beliefs held by a larger population of people with hip and/or knee osteoarthritis in New Zealand. This future study should use a questionnaire(s)

underpinned by the Common Sense Model of Health, but should also include measures that explore collaboration between patients and clinicians, and the associated therapeutic relationship.

## **Chapter 7 Selection of questionnaires for inclusion in the survey of people's osteoarthritis health, illness and treatment beliefs**

This chapter describes the steps undertaken to select the questionnaires included in the survey of osteoarthritis health, illness and treatment beliefs of people living with hip and/or knee osteoarthritis.

### **7.1 Research question**

The research question was:

Can the health, illness and treatment beliefs of people living with hip and/or knee osteoarthritis in New Zealand be measured with an existing health, illness and/or treatment beliefs questionnaire or questionnaires?

If more than one suitable questionnaire is identified, the most psychometrically robust and conceptually appropriate will be selected for inclusion in the survey.

### **7.2 Methods**

#### **7.2.1 Literature search**

A comprehensive computerised literature search was undertaken of electronic databases including CINAHL Plus, SocINDEX, MEDLINE, SPORTDiscus, PsycINFO, and SCOPUS via EBSCO host on the 2<sup>nd</sup> of February 2016. Search terms were selected in collaboration with an Auckland University of Technology librarian with extensive experience in searching the health literature and extracted from (i) key terms in the research question, and (ii) the findings of the qualitative descriptive study of the treatment beliefs held by people living with hip and/or knee osteoarthritis in New Zealand (Chapter 6). The terms were purposefully kept broad so that the search could include suitable studies that may not have been identified with more restrictive search terms. The following terms were used: (“chronic\* Ill\*” OR osteoarthritis\* OR arthritis\*) AND (valid\* OR reliab\*) AND (measure\* OR tool\* OR instrument\* OR scale\*) AND (illness\* N10 Belief\*) OR (illness\*



N10 attitude\*) OR (illness\* N5 perce\*) OR (health\* N10 Belief\*) OR (health\* N10 attitude\*) OR (health\* N5 perce\*).

The doctoral candidate first screened the titles of the identified studies to exclude duplicates and select studies that included the main concept of quantitative measures of health, illness and/or treatment beliefs. The candidate then read the abstracts of the selected studies and evaluated their appropriateness using the inclusion and exclusion criteria defined below (7.2.2 & 7.2.3). Abstracts that met any of the exclusion criteria were excluded from the study. When the abstract met the inclusion criteria, the full-text version was sourced and read. Those studies that continued to meet the inclusion criteria were retained for the critique. Additionally, reference lists of the included studies were manually screened for further suitable studies.

### **7.2.2 Inclusion criteria**

Studies were included if they and their associated questionnaire(s) were written in English; used a quantitative measure of health, illness and/or treatment beliefs; explored the measurement properties of the included questionnaires; included people with osteoarthritis; and had the full text available.

### **7.2.3 Exclusion criteria**

Studies were excluded if they were not published in a peer-reviewed journal and if the questionnaire used focused on upper limb dysfunction, or on coping or decision-making strategies. Health, illness and treatment beliefs questionnaires described in the grey literature (i.e. research reports not subjected to peer review, working papers or government documents and unpublished theses) were not included as they may not have been subjected to suitable peer review.

### **7.2.4 Identification and evaluation of questionnaires**

First, the questionnaires contained in the studies identified in the literature search were subjected to preliminary screening. The purpose of this was to assess the extent to which their constructs were reflective of the key aspects of the research question (7.1).

Questionnaires considered inappropriate were not retained. Second, studies were scrutinised for methodological quality and data were extracted guided by the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) checklist (Terwee et al., 2007). Third, questionnaires considered the most conceptually relevant and psychometrically robust were subjected by the doctoral candidate to a comparison with the themes and notions from the qualitative study (Chapter 6).

### **7.2.5 Appraisal of methodological quality and extraction of data for study comparison**

The appraisal of methodological quality was undertaken with the use of the COSMIN checklist (Terwee et al., 2007). All studies included in the literature review were appraised independently by two people, the doctoral candidate and an academic researcher with experience in the area of chronic musculoskeletal care, who was not one of the doctoral candidate's supervisors. Where there was disagreement in the rating of a study, the rating was discussed, and consultation was made of the COSMIN checklist guidelines (Terwee et al., 2012). If an agreement could not be reached, one of the candidate's supervisors (SB) appraised the study, and the rating was discussed until agreed upon.

The COSMIN checklist is a rigorous instrument for the evaluation of the methodological quality of measurement development and contains a rating system that allows the attributes of different measurements to be easily compared ([www.cosmin.nl](http://www.cosmin.nl): Mokkink et al., 2010; Terwee et al., 2012). The COSMIN checklist contains ten categories (internal consistency, reliability, measurement error, content validity, structural validity, hypothesis testing, cross-cultural validity, criterion validity, responsiveness and generalizability). All of the first nine categories contain items that the questionnaire is critiqued against. These items are rated on a four-point rating scale comprised of the following ratings *poor*, *fair*, *good*, and *excellent* (Mokkink et al., 2010). Only categories contained within the study were rated. As such, hypothesis testing, cross-cultural validity, criterion validity and responsiveness were not included in the table, as none of the studies explored these attributes.

The tenth category, called *generalizability*, guides the extraction of data from the studies and allows comparison between studies of features such as sample size, age and duration of

symptoms. Two additional questionnaire features that are not included in the COSMIN generalizability category were extracted, as it was believed that these features were relevant to the selection of the questionnaire for the survey. These features were the purpose of the questionnaire; and the presence of a theoretical foundation to the questionnaire. The extracted data about these additional features are presented with the other extracted data.

### **7.2.6 Comparison of questionnaire constructs to the themes of the qualitative study**

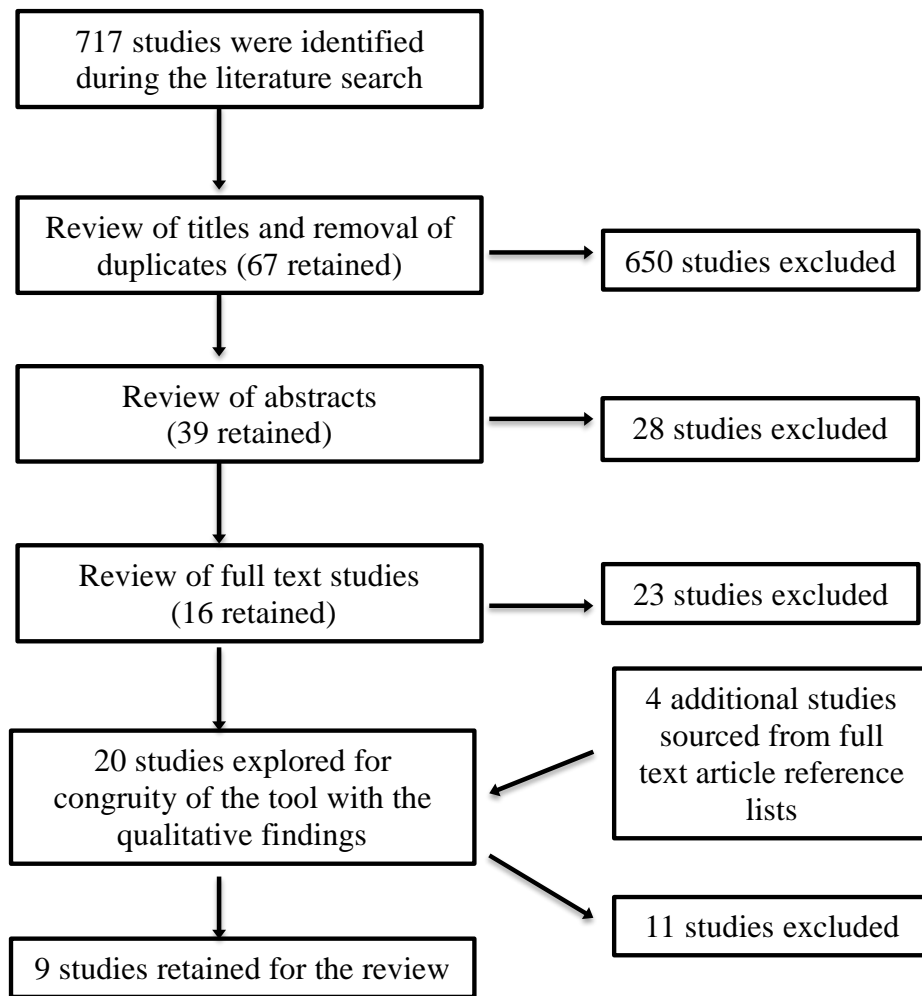
The questionnaires considered the most psychometrically robust and conceptually suitable following appraisal with the COSMIN checklist, were retained for a second comparison with the themes and notions from the qualitative study. Questionnaires were considered psychometrically robust if the related study received two or more *excellent* ratings on the COSMIN checklist. Questionnaires were considered conceptually relevant if the key constructs of the questionnaire related to the measurement of health, illness and treatment beliefs in people with osteoarthritis. The following steps were completed to identify the extent that the constructs of the retained questionnaires overlapped with the themes and notions identified in the qualitative descriptive study. First, the key constructs of the retained questionnaires were extracted. Second, these constructs were mapped against the themes and notions of the qualitative study (Chapter 6). Third, any overlap between constructs, and the themes and notions identified in Chapter 6 were examined.

## **7.3 Results**

### **7.3.1 Study selection and questionnaire identification**

The process of selecting studies is shown in (*Figure* ). A total of 717 studies were identified during the literature search. Six hundred and fifty studies were removed following the review of study titles, as the titles did not contain the key concepts of the study question or were duplicates. The abstracts of the remaining 67 studies were reviewed, resulting in the removal of a further 28 studies. The full-text of the remaining 39 studies were reviewed, 16 of which met the inclusion criteria. Screening of the reference lists of the retained studies

identified another four studies that met the inclusion criteria. Therefore, 20 studies were retained for initial comparison with the themes and notions of the qualitative descriptive study (Chapter 6). These studies contained 17 different quantitative questionnaires of health, illness and/or treatment beliefs (Table 4). The 17 measures (described in 20 studies) were examined to identify the extent that they could measure the themes and notions found in the qualitative descriptive study of people's beliefs (Chapter 6). These themes and notions are shown in Table 5.



**Figure 7.** Selection of studies including measures of health, illness and/or treatment beliefs for review.

**Table 4.***Potential Survey Measures Identified via the Literature Search*

Questionnaire	Author
Arthritis-related Health Belief Instrument (AHBI)	Ang et al. (2008); Park et al. (2015)
Knee Osteoarthritis Fears and Beliefs Questionnaire (KOFBeQ)	Benhamou et al. (2013)
Meaning of Illness Questionnaire	Brown et al. (1988)
Questionnaire to Identify Knee Symptoms (QuKS)	Clark et al. (2014)
Essential OA Knowledge Items	French et al. (2015)
Multi-Morbidity Illness Perception Scale (MULTPleS)	Gibbons et al. (2013)
Self-Management Needs of Knee Osteoarthritis (SMNKOA)	Kao et al. (2016)
Illness Perception Questionnaire –Revised (IPQ-R)	Kaptein et al. (2010); Moss-Morris et al. (2002)
Joint and Exercise Perceptions with RA Questionnaire	Law et al. (2013)
Exercise Attitudes Questionnaire - 18 (EAQ – 18)	Manigandan et al. (2004) Williams et al., (2009)
Perceived Efficacy in Patient-Physician Interaction (PEPPI – 5/10)	Maly et al. (1998); ten Klooster et al. (2012)
Ideas About Long Standing Health Problems (IALHGP)	McDonald et al. (2011)
Osteoarthritis Quality Indicator Questionnaire (OA-QI)	Osteras et al. (2013)
Summary of Arthritis (OA) Management Methods (SAMB)	Prior and Bond (2004)
Perceived Health Competence Scale (PHCS)	Smith et al. (1995)
Hip and Knee Beliefs Questionnaire (HKBQ)	Williams et al. (2009)
Personal Impact Health Assessment Questionnaire (PI HAQ)	Wylde et al. (2010)

Note: OA = Osteoarthritis, RA = Rheumatoid Arthritis.

**Table 5.***Themes and Notions Identified in Qualitative Study of People's Beliefs*

Themes	Notions
Theme One: Knowing the cause but not the consequence	Cause of osteoarthritis Expected progression
Theme Two: Explaining treatment beliefs	When to engage in treatment Where to engage in treatment
Theme Three: Understanding the importance of clear collaborative care	Informed Uninformed
Theme Four: Meaning more than just the joint	Emotions Participation limitations Support

Based on this examination, the following seven questionnaires (and corresponding studies) were not retained as they did not measure the themes of interest: Osteoarthritis Quality Indicator Questionnaire (Østerås et al., 2013), Perceived Efficacy in Patient-Physician Interaction (Maly & Krupa, 2007; ten Klooster et al., 2012), Meaning of Illness Questionnaire (Browne et al., 1988), Multi-Morbidity Illness Perception Scale (Gibbons et al., 2013), Ideas About Long Standing Health Problems (McDonald et al., 2011), Perceived Health Competence Scale (Smith et al., 1995), and the Personal Impact Health Assessment Questionnaire (Wylde et al., 2010). Additionally, the Self-Management Needs of Knee Osteoarthritis was removed because on analysis of the items, these were deemed not suitable for a New Zealand population (Kao & Tsai, 2016) and the Essential Knowledge Items scale was not retained, as it did not have a validated scoring method (French et al., 2015).

Two further studies were removed (Kaptein et al., 2010; Manigandan et al., 2004). The study by Manigandan et al. (2004) was removed because it was a brief research report and did not contain enough information on the questionnaire to merit critique. The study by Kaptein et al. (2010), was removed because it did not describe the validation of the questionnaire. However, the two measures contained within these studies were discussed in other identified studies, meaning the removal of these two studies did not reduce the

number of identified questionnaires. Therefore, a total of eight questionnaires described in nine studies were retained for appraisal of methodological quality and data extraction (Table 6).

**Table 6.**

*Potential Survey Questionnaires Identified*

Questionnaire	Author
Arthritis-related Health Belief Instrument (AHBI)	Ang et al. (2008); Park et al. (2015)
Exercise Attitudes Questionnaire - 18 (EAQ – 18)	Williams et al. (2009)
Hip and Knee Beliefs Questionnaire (HKBQ)	Williams et al. (2009)
Illness Perception Questionnaire –Revised (IPQ-R)	Moss-Morris et al. (2002)
Joint and Exercise Perceptions with RA Questionnaire	Law et al. (2013)
Knee Osteoarthritis Fears and Beliefs Questionnaire (KOFBeQ)	Benhamou et al. (2013)
Questionnaire to Identify Knee Symptoms (QuIKS)	Clark et al. (2014)
Summary of Arthritis (OA) Management Methods (SAMM)	Prior and Bond (2004)

Note: OA = Osteoarthritis, RA = Rheumatoid Arthritis.

**7.3.1.1 COSMIN checklist of methodological quality**

COSMIN checklist ratings for each of the included studies are shown in Table 7. Ratings ranged from *poor* through to *excellent* and were only allocated when the specific aspect of measurement was assessed in the study. Questionnaires are ranked in descending order, beginning with the study that received the highest number of excellent ratings. Components received a ‘not tested’ (N/T) rating, where the aspect of measurement was not included in the study. The number of different components of reliability and/or validity assessed by the COSMIN checklist differed across studies. For example, the KOFBeQ was assessed on five categories (internal consistency, reliability, measurement error, content validity and structural validity: Benhamou et al., 2013), whereas the AHBI could only be assessed on two (internal consistency, content validity: Ang et al., 2008; Park et al., 2014).

All of the nine identified studies received a rating for their internal consistency, ratings ranged from *poor* (Law et al., 2013; Park et al., 2014; Williams et al., 2012), through to *excellent* (Benhamou et al., 2013; Clark et al., 2014; Moss-Morris et al., 2002; Prior & Bond, 2004). Four of the identified studies explored temporal reliability (test–retest), two

measures being rated *fair* (Benhamou et al., 2013; Moss-Morris et al., 2002) and the other two rated *good* (Williams et al., 2012). One study investigated measurement error, and this was rated as *fair* (Benhamou et al., 2013). The majority of the identified studies measured the content and structural validity of the associated questionnaire (Table 7). These ratings ranged from *fair* through to *excellent*. The KOFBeQ (Benhamou et al., 2013) received the most *excellent* ratings on the COSMIN checklist, with a total of three.



**Table 7.**

*Summary of the COSMIN Checklist Rating of Methodological Quality, Listed from Strongest to Weakest Rating*

Questionnaire	Author	Internal consistency	Reliability	Measurement error	Content validity	Structural validity
KOFBeQ	Benhamou et al. (2013)	Excellent	Fair	Fair	Excellent	Excellent
QuIKS	Clark et al. (2014)	Excellent	N/T	N/T	Fair	Excellent
IPQ-R	Moss-Morris et al. (2002)	Excellent	Fair	N/T	N/T	Excellent
Joint and Exercise Perceptions with Rheumatoid Arthritis Questionnaire	Law et al. (2013)	Poor	N/T	N/T	Excellent	Excellent
SAMM	Prior and Bond (2004)	Excellent	N/T	N/T	N/T	Excellent
AHBI	Park et al. (2015)	Poor	N/T	N/T	N/T	Excellent
	Ang et al. (2008)	Fair	N/T	N/T	Fair	N/T
HKBQ	Williams et al. (2012)	Poor	Good	N/T	Fair	Good
EAQ – 18	Williams et al. (2012)	Poor	Good	N/T	Fair	Fair

Note: AHBI = Arthritis-related Health Beliefs Instrument, QuIKS = Questionnaire to identify knee symptoms, IPQ-R = Illness Perception Questionnaire – Revised, EAQ – 18 = Exercise Attitudes Questionnaire - 18, SAMM = Summary of Arthritis Management Methods, HKBQ = Hip and Knee Beliefs Questionnaire, KOFBeQ = Knee Osteoarthritis Fears and Beliefs Questionnaire, N/T = Not Tested.

### **7.3.1.2 Extracted data**

The results of the data extraction process are presented in Table 8. The results show that the questionnaires were designed and developed for a variety of purposes. These differed between studies and ranged from questionnaires that focus on general health and illness beliefs such as the Illness Perception Questionnaire – Revised (IPQ-R: Moss-Morris et al., 2002), to those that specifically focus on osteoarthritis beliefs, like the Arthritis-related Health Belief Instrument (AHBI: Ang et al., 2008; Park et al., 2014) and the KOFBeQ (Benhamou et al., 2013). Four studies referred to the development of the questionnaire being guided by a theoretical model of health and illness beliefs, including the Health Beliefs Model (AHBI: Ang et al., 2008; Park et al., 2014) and the Common Sense Model (IPQ-R: Moss-Morris et al., 2002; Williams et al., 2012). While Benhamou et al. (2013) alluded to the KOFBeQ being supported by theoretical models of fear avoidance behaviour, the paper does not explicitly state how this occurred.

Demographic and disease characteristics data were extracted from the identified studies (Table 8). The group mean age of participants ranged from 52.2 (Clark et al., 2014) to 74.1 years (Park et al., 2014) and in most cases the studies included more females than males. The study by Moss-Morris et al. (2002) included multiple samples, each with a different health condition. Therefore, only the demographic and disease characteristics of the participants with osteoarthritis are reported here. Reports of mean duration of symptoms range from approximately one year (Park et al., 2014) through to 26 years (Moss-Morris et al., 2002). Six studies reported the location and number of affected joints of participants. Some studies focused on one affected joint location (i.e. knee[s]: Benhamou et al., 2013; Clark et al., 2014), whereas other studies included participants with osteoarthritis of multiple different joints (Prior & Bond, 2004). Four studies reported measures of disease severity or disability, using measures such as the Western Ontario and McMaster University Arthritis Index (WOMAC: Ang et al., 2008; Benhamou et al., 2013) or the Knee Osteoarthritis Outcome Score (KOOS: Clark et al., 2014). Group mean body mass index (BMI) calculations were reported in two studies (Benhamou et al., 2013; Clark et al., 2014).

Study characteristics extracted included data on population setting, recruitment method and response rate. Participants were recruited from a variety of different settings, such as the

general population (Ang et al., 2008; Benhamou et al., 2013) or existing osteoarthritis studies (Williams et al., 2012). Most studies used samples of convenience. Five of the studies reported the survey response rates, ranging from 57% (Prior & Bond, 2004), through to 98% (Park et al., 2014).

**Table 8.***Data Extracted Following the COSMIN Checklist*

Tool	Author	Purpose of questionnaire	Theory	Median or mean age (SD) years	Gender	Duration of symptoms (SD) years	Joints affected	Severity	Group mean BMI (SD)	Population (setting)	Method used to select participants	Percentage of missing responses
AHBI	Ang et al. (2008)	Measures osteoarthritis beliefs	Health Beliefs Model	64.4 (9.7)	39% female	N/R	Hip(s) and / or knee(s)	56.3(14.2) WOMAC	N/R	General population	Convenience	Unclear?
	Park et al. (2014)			74.1 (8.3)	76.5% female	Chronic 91% greater than 1 year	Unclear	Unclear	N/R	Community-dwelling - registered as part of a healthy ageing research initiative	Convenience sample recruited consecutively	1.7% missing data (98.3% complete data)
EAQ – 18	Williams et al. (2012)	Measures general exercise beliefs	N/R	N/R	N/R	N/R	Hip and/or knee	N/R	N/R	People enrolled in a larger RCT for OA management	Convenience: participants were engaged in a larger trial	Unclear
HKBQs	Williams et al. (2012)	Measures hip and knee osteoarthritis beliefs	CSM	N/R	N/R	N/R	Hip and/or knee	NR	N/R	People enrolled in a larger RCT for OA management	Convenience: participants were engaged in a larger trial	Unclear
IPQ-R	Moss-Morris et al. (2002)	Measures general health and illness beliefs	CSM	61.8(13.4)	76% female	26.6 (15.6)	N/R	N/R	N/R	Variety of different settings	Consecutive patients from out-patient hospital clinics and support groups	between 60-96%

Tool	Author	Purpose of questionnaire	Theory	Median or mean age (SD) years	Gender	Duration of symptoms (SD) years	Joints affected	Severity	Group mean BMI (SD)	Population (setting)	Method used to select participants	Percentage of missing responses
Joint and Exercise Perceptions with Rheumatoid Arthritis Questionnaire	Law et al. (2013)	Measures about joint care and exercise beliefs in people with RA.	N/R	54	88% female	9	N/R	N/R	N/R	Members of the National Rheumatoid Arthritis Society	Convenience	N/R
KOFBeQ	Benhamou et al. (2013)	measures knee OA fears and beliefs	Unclear	68.2(10.1)	62.5% female	6.6 (5.3)	Knee(s)	31.8 (12.9) WOMAC	28.3 (4.9)	General population	Consecutive patients from randomly selected GP's and rheumatologists	Response rate 86.6%
QuIKS	Clark et al. (2014)	Identifies early symptoms of knee OA	N/R	52.2(6.7)	59.2% female	N/R	Knee(s)	KOOS: (scores provided for each subscale)	27.6 (5.0)	Enrolled in general medical clinic	Convenience	Response rate 63.1%
SAMM	Prior and Bond (2004)	Measures treatment strategies use for OA	CSM	Clinic group 70.9(10.4), university clinic 66.8(9.7)	Clinic group 53.2%, university clinic 87.3% female	Clinic group 19.7(14.7), university clinic 13.6(11.6)	Knee, hip, spine, shoulder and hands	Global health scale (reports of pain, function)	N/R	Community-based arthritis self-help groups and a university clinic	Consecutive patients from university clinic and members of arthritis support groups	Clinic group 57%, university clinic 68%

Note: AHBI = Arthritis-related Health Beliefs Instrument, QuIKS = Questionnaire to Identify Knee Symptoms, IPQ-R = Illness Perception Questionnaire – Revised, EAQ – 18 = Exercise Attitudes Questionnaire - 18, SAMM = Summary of Arthritis Management Methods, HKBQ = Hip and Knee Beliefs Questionnaire, KOFBeQ = Knee Osteoarthritis Fears and Beliefs Questionnaire, NR = Not Reported, BMI = Body Mass Index, OA = Osteoarthritis, RCT = Randomised Controlled Trial, GPs = General Practitioners, SD = Standard Deviation.

### 7.3.2 Comparison of questionnaire constructs to the themes of the qualitative study

Following the analysis of the results of the COSMIN checklist, the IPQ-R and KOFBeQ were retained for comparison with the themes and notions of the qualitative study (Table 9). The justification for not including the other six questionnaires is presented in the Discussion section below. The key constructs of IPQ-R and the KOFBeQ do not individually cover all of the themes and notions identified in the qualitative study of people's beliefs. However, collectively the two questionnaires cover eight of the nine identified notions.

**Table 9.**

*The Qualitative Themes that Relate to Constructs of the Two Most Robust Questionnaires Reviewed*

Themes	Notions	IPQ-R	KOFBeQ
One: Knowing the cause but not the consequence	Cause of osteoarthritis	Yes (Identity)	Yes (Beliefs about the disease)
	Expected progression	Yes (Timeline / consequence)	Yes (Beliefs about daily living activities / Beliefs about sports and leisure activities)
Two: Explaining treatment beliefs	When to engage in treatment	Yes (Control or cure)	No
	Where to engage in treatment	Yes (Control or cure)	No
Three: Understanding the importance of clear collaborative care	Informed	No	Yes (Beliefs about physicians)
	Uninformed	No	Yes (Beliefs about physicians)
Four: More than just the joint	Emotions	Yes (Emotional response)	No
	Participation limitations	Yes (Personal control)	Yes (Beliefs about sports and leisure activities)
	Support	No	No

Note: IPQ-R = Illness Perception Questionnaire – Revised (Moss-Morris et al., 2002), KOFBeQ = Knee Osteoarthritis Fears and Beliefs Questionnaire (Benhamou et al., 2013), No = no clearly related construct included in the reviewed questionnaire.

## 7.4 Discussion

Eight questionnaires were subjected to the rating of methodological quality and data extraction. The results indicate that questionnaire development varied in methodological

quality from study aspects that were *excellent* to those that were *poor*. Additionally, the extraction of data about the study characteristics highlighted that some questionnaires were more suitable than others for inclusion in the survey of people's health, illness and treatment beliefs of hip and/or knee osteoarthritis in New Zealand. Based on this appraisal, the IPQ-R (Moss-Morris et al., 2002) and the KOFBeQ (Benhamou et al., 2013) questionnaires were considered the most methodologically and conceptually suitable for measuring the osteoarthritis health, illness and treatment beliefs of people with hip and/or knee osteoarthritis.

Six questionnaires were not retained for a number of different reasons. The EAQ – 18 (Williams et al., 2012) and the Joint and Exercise Perceptions with Rheumatoid Arthritis Questionnaire (Law et al., 2013) were not included because on closer inspection it was apparent that both questionnaires explored few of the themes and notions identified in the qualitative study of people's osteoarthritis beliefs. The QuKS (Clark et al., 2014) was not retained as it was designed with the primary purpose of identifying people with early symptoms of osteoarthritis and thus would not be appropriate for people who have had the condition for a long period. The SAMM (Prior & Bond, 2004) and the HKBQ (Williams et al., 2012) were removed as both questionnaires were not visibly supported by an existing theoretical model of health and illness beliefs, and did not contain constructs reflecting the majority of themes and notions identified in the qualitative study. The AHBI (Ang et al., 2008; Park et al., 2014) was not retained because the items focus predominantly on beliefs about surgical treatment, and the questionnaire has been subjected to limited analysis of measurement quality.

IPQ-R has constructs that are similar to six of the notions identified in the qualitative study. Strengths of the measure are that it is based on the Common Sense Model (Leventhal et al., 2008), and has previously been used to explain health beliefs in people with knee osteoarthritis (Kaptein et al., 2010). Additionally, the questionnaire has been used extensively in research over the past ten years with a range of different health conditions such as diabetes, chronic fatigue syndrome and low back pain (Bijsterbosch et al., 2009; Figueiras & Alves, 2007; Harvey & Lawson, 2009; Moss-Morris et al., 2002). The two main limitations of this questionnaire are that it is long, 70 items, and it lacks items that explore beliefs about patient-clinician interaction (Table 9: Theme 3. *Understanding the importance of clear collaborative care*).

The KOFBeQ has constructs that are similar to five of the notions identified in the qualitative study. The strengths of the measure are that it was developed and tested on people with knee osteoarthritis, it explores many of the notions described in the qualitative study, and it also demonstrates excellent construct validity, internal consistency and test-retest reliability (Benhamou et al., 2013). This questionnaire appeared to be the most robust when evaluated with the COSMIN checklist, receiving the greatest number (three) of excellent ratings. Moreover, it was the only questionnaire to include items that explored beliefs about patient-clinician interactions. The two limitations of this measure are that it is not supported by an explicit theoretical model of health and illness beliefs and it has only been validated on people with osteoarthritis of the knee joint, not the hip.

This systematic review had two strengths. First, the search methods are presented so that the systematic review is structured and reproducible. Second, retained studies were critiqued using the COSMIN checklist, which is a reliable and valid tool for appraising questionnaire development (Terwee et al., 2012). This systematic review had two limitations. One, the selection of the inclusion criteria and databases may have inadvertently resulted in some studies not being found in the search due to publication or selection bias. For example, potential relevant studies not published in English. Two, the heterogeneity of the identified studies and questionnaires limited the ability to make direct, meaningful comparisons between studies.

## 7.5 Conclusions and recommendations

In conclusion, as no single questionnaire covered all of the identified themes or notions of the qualitative descriptive study, two questionnaires should be used for the survey. Together the IPQ-R and KOFBeQ include components that relate to eight of the nine notions identified in the qualitative study. The IPQ-R is a tried and tested measure. The KOFBeQ was the most robust on analysis of measurement quality. While the IPQ-R and the KOFBeQ do not include a construct that specifically explored the notion of *support*, the IPQ-R does include a small number of items that ask about the impact of living with osteoarthritis on family and friends. Hence, it was decided that these items would be acceptable for exploring this notion. Therefore, it was decided that the survey of people's beliefs about hip and/or knee osteoarthritis in New Zealand be constructed with the IPQ-R and the KOFBeQ.



## **Chapter 8 A cross-sectional survey of New Zealanders' health, illness and treatment beliefs about their hip and/or knee joint osteoarthritis**

### **8.1 Research question**

The research question was:

Are the Illness Perception Questionnaire – Revised (IPQ-R) and the adapted Knee Osteoarthritis Fears and Beliefs Questionnaire (KOFBeQ) reliable (internally consistent) and valid measures for people with hip and/or knee joint osteoarthritis in the New Zealand context?

### **8.2 Methods**

#### **8.2.1 Study design**

The study was a cross-sectional observational design. Data were collected by questionnaires administered both online and via a paper booklet.

#### **8.2.2 Participants and sample size**

People were eligible to take part if they were aged 18 years or over, had a physician- or physiotherapist-confirmed diagnosis of either hip and/or knee joint osteoarthritis, were living in New Zealand at the time of data collection and had sufficient command of the English language skills to complete the survey. The sample size was based on recommendations of Pallant (2010), who stated that data sets with greater than 200 participants are generally sufficient for principal component analysis.

#### **8.2.3 Measures**

The survey consisted of open- and closed-ended questions and was divided into three sections: (i) demographic and disease characteristics, (ii) health, illness and treatment beliefs questionnaires about hip and/or knee joint osteoarthritis (IPQ-R: Moss-Morris et

al., 2002; KOFBeQ: Benhamou et al., 2013), and (iii) perceived disease severity and functional ability (Appendix G).

### **8.2.3.1 Section 1: Demographic and disease characteristics**

The first section of the questionnaire comprised of two parts. Part one collected demographic data about the participant such as age and level of education completed. Part two collected disease characteristics data about the participant such as the joints affected with osteoarthritis and duration of symptoms. Current recommendations for collecting demographic and disease characteristics data in osteoarthritis research informed the questions contained in this section (Rolfson et al., 2016).

### **8.2.3.2 Section 2: Health, illness and treatment beliefs questionnaires about hip and/or knee joint osteoarthritis**

The osteoarthritis health, illness and treatment beliefs were measured by the IPQ-R (Moss-Morris et al., 2002) and an adapted version of the KOFBeQ (Benhamou et al., 2013).

*Illness Perception Questionnaire - Revised:* The IPQ-R includes 70 items that are rated either with a dichotomous scale (yes/no, 14 items) or on a 5-point Likert scale that measures the level of agreement (*strongly disagree* to *strongly agree*, 56 items: Moss-Morris et al., 2002). The wording of the IPQ-R was adapted to make it appropriate for people with osteoarthritis. For example, terms like '*your illness*' became '*your osteoarthritis*'. The questionnaire has three sections. The first section includes 14 items that explore illness identity and symptoms. The second section contains 38 items and measures seven different components of a person's health and illness beliefs. These components are (i) identity, (ii) timeline, (iii) consequence, (iv) personal control, (v) control or cure, (vi) illness coherence - cyclical nature of the disease, and (vii) emotional response. The third section includes 18 items that measure causal beliefs. The section has four components called (i) psychological, (ii) risk factors, (iii) immunity, and (iv) accidents (luck). The internal consistency of the subscales within the sections are acceptable, with Cronbach's alpha scores that range from 0.79 - 0.89 (Moss-Morris et al., 2002).

*Adapted Knee Osteoarthritis Fears and Beliefs Questionnaire:* The KOFBeQ was originally designed to collect data from people with knee joint osteoarthritis (Benhamou et al., 2013). Therefore, items including reference to knee joint osteoarthritis were adapted to include reference to the hip joint. For example, '*Old age is the main cause of*

*knee OA*’ became *‘Old age is the main cause of hip and/or knee OA’*. Additionally, some items were re-worded so that they would be suitable for a New Zealand population. For example, the word *‘physician’* was replaced with *‘doctor’*, as physician is not an everyday term in New Zealand. The KOFBeQ contained 25 items when first developed. Exploratory factor analysis by the developers of the questionnaire led to the removal of 14 items perceived to be redundant (Benhamou et al., 2013). For this study, it was decided that all 25 items would be retained for the survey because many of them asked questions that related to findings from the qualitative study of people’s beliefs reported earlier in this thesis (Chapter 6). Items in the questionnaire are rated on a 10-point Likert scale where 1 = *totally disagree*, to 10 = *totally agree*. Assessment of the questionnaire has shown it to be explained by a four-factor structure representing (i) fears and beliefs about daily living activities, (ii) fears and beliefs about physicians, (iii) fears and beliefs about the disease, and (iv) fears and beliefs about sports and leisure activities (Benhamou et al., 2013). The internal consistency of the scale (0.85) and the four individual subscales (0.89, 0.78, 0.85, and 0.84 respectively) are all acceptable, and the tool has good test re-test reliability (ICC = 0.81: Benhamou et al., 2013).

#### **8.2.3.3 Section 3: Perceived disease severity and functional ability**

The measures used were the P4 pain scale, the Hip disability and Osteoarthritis Outcome Score (HOOS) and the Knee Osteoarthritis Outcome Score (KOOS), in keeping with international recommendations (Rolfson et al., 2016).

*P4*: The P4 is a generic measure of pain that is valid and reliable, and explores greater dimensionality of the pain than the single-item Numerical Pain Rating Scale (Spadoni et al., 2004). The P4 requires people to score their average pain in the morning, afternoon, evening and with activity over the past two days. The questionnaire is scored on a 10-point rating scale, where 1 = *‘no pain’* to 10 = *‘pain as bad as it can be’*.

*Hip disability and Osteoarthritis Outcome Score (HOOS)*: The HOOS (English LK Version 2.0) is a 40-item questionnaire constructed to assess patient-relevant outcomes on five separate subscales in people with hip pain (symptoms [5 items], pain [10 items], activities of daily living [17 items], sport and recreation function [4 items], and hip related quality of life [4 items]: Nilsson, Lohmander, Klässbo, & Roos, 2003). Each of the 40 items was scored from 0 to 4 (i.e. no = 0 to extreme = 4). The measure was found to be valid and responsive in people with hip osteoarthritis (Nilsson et al., 2003). Construct validity was tested by examining correlations between related

subscales of the HOOS and SF-36, correlations were acceptable and ranged from  $r = 0.49$  to  $r = 0.66$ . The responsiveness of the five subscales was evaluated by calculation of the standardised response mean (SRM) scoring 2.11, 1.83, 1.70, 1.29 and 1.64 respectively (Nilsdotter et al., 2003). Items are rated on a five-point Likert scale, ranging from no or minimal symptoms (*none/never*) to severe or constant symptoms (*extreme/constant/always/totally*).

*Knee Osteoarthritis Outcome Score (KOOS)*: The KOOS is a knee-specific questionnaire, developed to assess people's opinions about their knee osteoarthritis and associated problems on five separately scored subscales constructed from 42 items (pain [9 items], symptoms [7 items], activities of daily living [17 items], sport and recreation [5 items], and knee-related quality of life [4 items]: Roos & Lohmander, 2003). Each of the 42 items was scored from 0 to 4 (i.e. no = 0 to extreme = 4). The measure is known to be suitable for the evaluation of people with both short-term and long-term consequences of a knee injury. Construct validity was tested and considered acceptable following examination of correlations between related subscales of the KOOS and SF-36 (Roos & Toksvig-Larsen, 2003). SRM scores for the questionnaire subscales are 2.12, 1.25, 1.90, .88, and 1.99. Items are rated on a five-point Likert scale, ranging from no or minimal symptoms (*none/never*) to severe or constant symptoms (*extreme/constant/always/totally*).

#### **8.2.4 Procedure**

Before being administered, all the questionnaires contained in the survey were tested for face validity and utility. Three people living with hip and/or knee osteoarthritis and two staff from Arthritis New Zealand read the questionnaires and provided feedback. This feedback led to minor amendments to the wording of the survey questionnaire, such as replacing the word physician with the word doctor, in the amended KOFBeQ.

The study was granted ethical consent by the institutional ethics committee (AUTEC: 16/202: Appendix H) on the 29th June 2016. The final version of the survey questionnaire was formatted so that it could be administered both as a paper booklet and online (Appendix G). Therefore, participants could choose to complete the survey in the manner they preferred. The participant information form was included at the start of the survey questionnaire.

The survey was advertised through local health clinics; the Arthritis New Zealand website, Facebook page and E-newsletter; community education evenings; and through a local public orthopaedic department (North Shore Hospital) (Appendix I). Data were collected between 1st September and 1st December 2016. Participants who chose to complete the survey online entered their responses to the questionnaire directly via SurveyMonkey.com. Participants who chose to complete the pen and paper version of the survey were directed to contact Arthritis New Zealand either by email or via the organisation's free phone number. An administrator at Arthritis New Zealand collected their postal details and sent each person a copy of the survey with a stamped envelope addressed to the doctoral candidate at Auckland University of Technology (AUT). The participants then mailed the survey to AUT on completion. Participants could not be identified or traced because the responses were fully anonymised. The participants were asked to complete all questions in the first two sections of the survey. The third section required participants to complete the P4 scale, and either the HOOS (hip) or the KOOS (knee). Participants completed the questionnaire that corresponded with the joint that they believed most affected them (hip or knee). Those who completed the survey online were asked which joint bothered them most, and based on their select either the HOOS or KOOS was presented to participants for completion. Submission of the survey questionnaire was considered consent to use the data for the study.

### **8.2.5 Data preparation**

All data from the paper version of the survey were extracted and manually entered into SurveyMonkey.com by the doctoral candidate. Next, the data were downloaded as a Statistical Package for Social Science (SPSS: IBM, USA) file from SurveyMonkey.com. Question codes were generated for all data. The correctness of all data was checked using descriptive statistics. The categorical data were checked using frequency and range scores, and continuous data were checked using the range, mean and standard deviation. Identified errors were corrected. Continuous data were assessed for normal distribution. This assessment included exploration of the skewness and kurtosis statistics, as well as plotting and reviewing histograms and stem and leaf plots. The data from questions that asked people to tick all answers that applied to them (multiple answers) were converted to a dichotomous reporting format. For example, *'Has your doctor told you that you have any of the following? Heart disease...'* became *'Has your doctor told you that you have heart disease?'* (Yes/No). The scores of any

negatively worded items were reversed (IPQ-R *Beliefs* Scale). Free text fields such as duration of symptoms were converted to a numerical format for analysis (i.e. five years became 5). Where demographic frequency data had very few counts (i.e. one person), categories were collapsed and included as an 'Other' category. Demographic categories not selected by any participant were removed (i.e. ethnicity: Middle Eastern).

### 8.2.6 Data analysis

All data from the study were analysed using SPSS version 24.0 (IBM, USA), with the alpha level set at  $p < .05$ . The online platform reduced missing data because these participants were directed by prompts in the programme to complete any missed item or question. Paper surveys returned with missing data from the demographic or disease characteristics section were not included in the data analysis ( $n=1$ ). Data from a single questionnaire (i.e. the IPQ-R or adapted KOFBeQ) were not included in the analysis if the questionnaire was missing answers to five or more questions or items from the questionnaire. Five complete paper surveys were discarded due to large amounts of missing data in the belief and perceived disability sections of the survey. Where answers from four or fewer items or questions were missing from a single questionnaire, participants were given a median score for each item.

*Survey return rate:* It was not possible to calculate a total return rate for all surveys as participants had the option of completing the study either online or in a pen and paper form. The number of people who saw the online advertisement of the study but choose not to participate is not known. However, it was possible to calculate the return rate of the printed version of the survey. The total number of returned surveys was divided by the total number of surveys administered to potential participants. A percentage score was calculated by multiplying this number by 100.

#### 8.2.6.1 Section 1: Demographic and disease characteristics

All demographic and disease characteristics data were categorical, except for body mass index (BMI), disease duration, medication and dietary supplements. For the categorical data, the total number of participants who selected each category were summed and calculated as a percentage score of the total number of people who answered the question. Calculation of BMI was completed by dividing the participants' weight in kilograms by their height in metres squared. The sample's mean BMI and the standard deviation scores were calculated. Data about medication and dietary supplements taken

by participants were extracted, and response frequency was counted. Similar medications and supplements were grouped together where appropriate. For example, different brands of non-steroidal anti-inflammatory drugs (NSAIDs) were collectively reported as 'NSAIDs'. Drugs or supplements that were reported by only one person were collectively reported as 'Other'.

#### **8.2.6.2 Section 2: Health, illness and treatment beliefs questionnaires about hip and/or knee joint osteoarthritis**

*IPQ-R*: Data from the three distinct sections of the IPQ-R were analysed separately (*Illness Identity*, *Illness Beliefs*, and *Causal Beliefs*). Data from the 14 items of the *Illness Identity* section were analysed as follows. The total number of participants who stated that they had experienced each of the listed symptoms since being diagnosed with osteoarthritis or attributed the symptom to their osteoarthritis were counted and represented as a percentage of the total number of people who answered the question.

Data from the 38 items of the IPQ-R *Illness Beliefs* subscale were analysed as follows. First, the mean and standard deviation scores were calculated to indicate the response distribution for data from all items of the scale. Second, to determine if the sample was suitable for principal component analysis (PCA), the correlation matrix was calculated and screened to ensure the presence of correlations of .3 or greater, and the data were subjected to Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of Sphericity. Third, the data were subjected to principal component extraction. In keeping with findings of Moss-Morris et al. (2002), the criteria were limited to a seven-factor solution, the Eigenvalues for each factor were plotted. Fourth, because it was expected that items would not be completely independent of each other, the data were subjected to a varimax rotation. For clarity, factor loading scores of 0.45 or less were concealed. Fifth, each factor (subscale) was named, and the internal consistency was examined by analysis of the Cronbach's alpha scores. Where appropriate, the names used matched those proposed by Moss-Morris et al. (2002). The scale or subscale was described as having acceptable internal consistency if the collective items made conceptual sense and had a Cronbach's alpha score equal or greater than 0.7. Sixth, for each of the seven subscales, the group mean scores and standard deviations were calculated.

The third section of the IPQ-R (*Causal Beliefs*) contains 18 items. Collected data were subjected to the following analysis. First, data from all items in the section were

analysed by descriptive statistics to indicate the response distribution for each item. Next, to determine if the sample was suitable for PCA, the correlation matrix was calculated and screened to ensure the presence of correlations of .3 or greater, and the data were subjected to Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of Sphericity. The data were subjected to principal component extraction to assess the degree to which the factor structure was in keeping with the four-factor solution found by Moss-Morris et al. (2002). Finally, Eigenvalues for each factor were plotted. No assessment of the subscales was completed as no logical principal components were identified.

*Adapted KOFBeQ:* First, the mean and standard deviation scores were calculated to indicate the response distribution for all items of the adapted KOFBeQ. Second, to determine if the sample was suitable for PCA, the correlation matrix was calculated and screened to ensure the presence of correlations of .3 or greater, and data were subjected to Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of Sphericity. Third, the data were subjected to principal component extraction. In keeping with findings of Benhamou et al. (2013), the criteria were limited to a four-factor solution, the Eigenvalues for each of the four factors were plotted. Fourth, as it was expected that items would not be completely independent of each other, the data were subjected to a varimax rotation. For clarity, factor loading scores of 0.45 or less were concealed. Fifth, each subscale (factor) was named, and the internal consistency was examined by analysis of the Cronbach's alpha scores. Where appropriate, the names used matched those proposed by Benhamou et al. (2013). The scale or subscale was described as having acceptable internal consistency if the collective items made conceptual sense and had a Cronbach's alpha score equal or greater than 0.7. Sixth, for each of the four subscales, the group mean scores and standard deviations were calculated.

### **8.2.6.3 Section 3: Perceived disease severity and functional ability**

*P4:* Data from the four P4 items were summed to give a total score out of a maximum of 40. Higher scores indicate that the participant rated the pain as more severe. Descriptive statistics were calculated to indicate the range, the sample mean and standard deviation (Spadoni et al., 2004).

*HOOS:* Data from the HOOS were analysed both as a total score and as the five subscales. Therefore, the total score was out of a maximal score of 160. The group



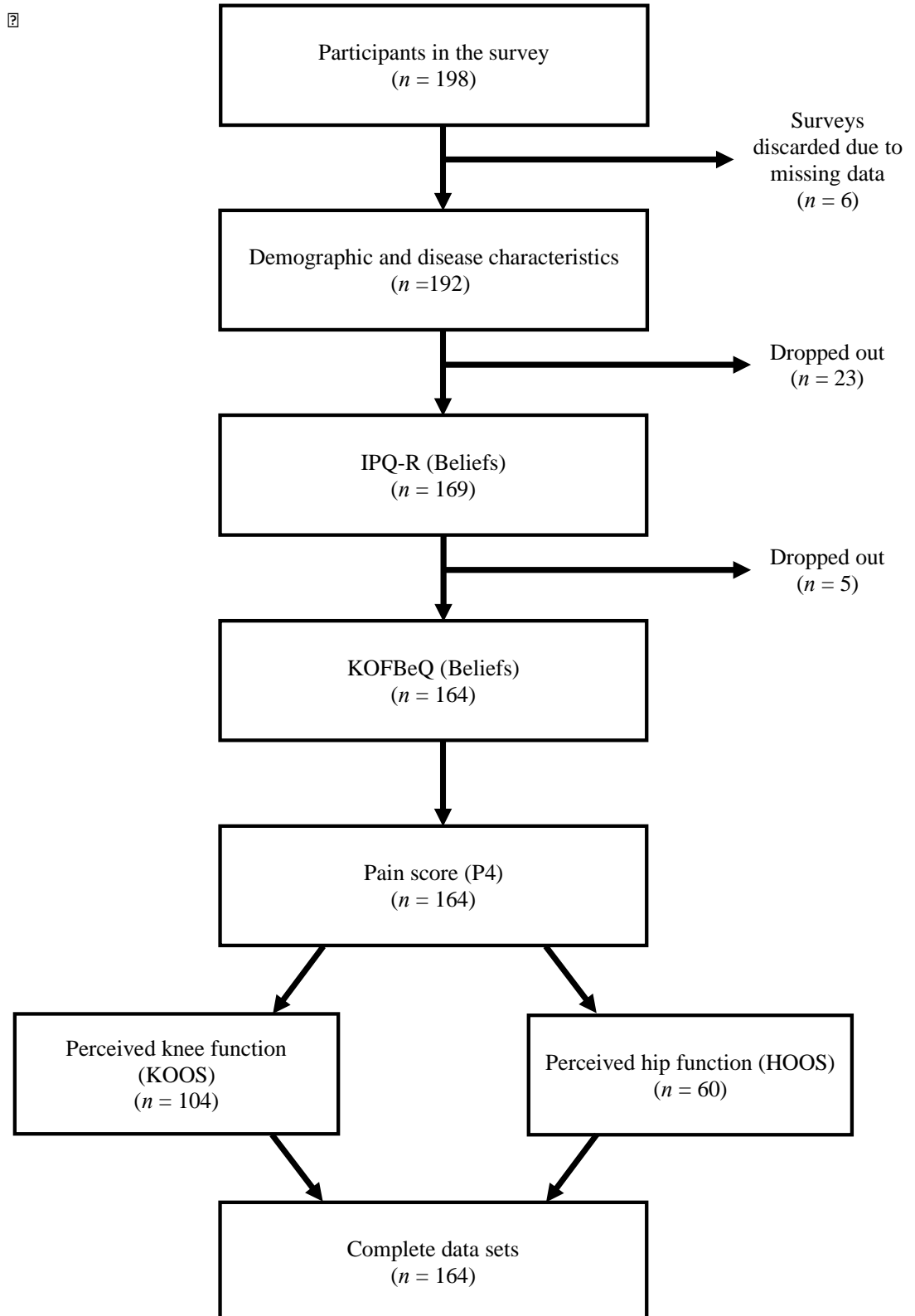
mean and the standard deviation were calculated for the total scale and each of the subscales. All scores were then transformed into 0 to 100 scale, where 100 indicated no osteoarthritis-related problems, to allow comparison of the different subscales (Nilsson et al., 2003). The internal consistency of the subscales and the total HOOS scale were examined by analysis of the Cronbach's alpha scores. Where the collective items made conceptual sense and had a Cronbach's alpha score equal or greater than 0.7, the scale or subscale was described as having good internal consistency.

*KOOS*: Data from the KOOS were managed similarly to that of the HOOS, both as a total score and as the five subscales. Therefore, the total score was out of a maximal score of 168. The group mean and the standard deviation were calculated for the total scale and each of the subscales. All scores were then transformed into 0 to 100 scale, where 100 indicated no osteoarthritis-related problems, to allow comparison of the different subscales (Roos & Lohmander, 2003). The internal consistency of the subscales and the total KOOS scale were examined by analysis of the Cronbach's alpha scores. Where the collective items made conceptual sense and had a Cronbach's alpha score equal or greater than 0.7, the scale or subscale was described as having good internal consistency.

## 8.3 Results

### 8.3.1 Participants

Of the 198 people who participated in the study, 130 answered the survey online, and 68 completed the printed version. Six of the printed surveys were discarded due to missing data, and 28 participants dropped out while completing the online survey. The return rate of the printed surveys was 45% (150 posted out and 68 returned). *Figure* shows a summary of the survey sections completed and dropouts from each section.



**Figure 8.** Overview of survey data collection, examining people's beliefs about hip and/or knee osteoarthritis. Note: HOOS = Hip disability and Osteoarthritis Outcome Score, IPQ-R = Illness Perception Scale - Revised, KOFBeQ = Knee Osteoarthritis Fears and Beliefs Questionnaire, KOOS = Knee Osteoarthritis Outcome Score.

### 8.3.2 Section 1: Demographic and disease characteristics

Of the 192 participants who answered this section, the majority were between 50 and 79 years of age ( $n=157$ , 82%). Approximately 75% of participants were female and the majority of participants described their ethnicity as New Zealand European. Participants most frequently reported living with their partner or spouse and living in their own home (Table 10). Most had completed either secondary or tertiary education.

**Table 10.**

*Participant Demographic Characteristics*

Demographic characteristic	Response count ( $n = 192$ )	Percentage of sample
Age (years)		
Less than 39	6	3.1%
40 to 49	16	8.3%
50 to 59	42	21.9%
60 to 69	57	29.7%
70 to 79	58	30.2%
80 or older	13	6.8%
Gender		
Male	47	24.5%
Female	145	75.5%
Ethnicity		
New Zealand European	181	94.3%
Maori	4	2.1%
Pacific Islander	2	1.0%
Other*	5	2.5%
Highest level of education		
Primary	3	1.6%
Secondary	79	41.1%
Tertiary	110	57.3%
Current living status ( $n = 188$ )		
living alone	52	27.6%
with family or friend	33	17.5%
with partner or spouse	103	44.9%
in my own home	103	54.8%
in a flat	6	3.2%
in a retirement village	5	2.7%

Note: \*Other = African, Asian, American, Australian and Latin American.

Table 11 shows a summary of the group's disease characteristics. The BMI score categorises the sample's mean score as overweight. Most stated that they engaged in two or more hours of physical activity per week and very few participants smoked. Participants reported having a number of different comorbidities. The most regularly listed co-morbidities being high blood pressure, depression and heart disease. The most frequently reported location of osteoarthritis was the knee joint, and the majority of participants had their diagnosis of osteoarthritis confirmed by a doctor. Participants reported having consulted a range of different clinicians in the 12 months before completing the survey. The clinicians most commonly cited were general practitioners, physiotherapists and orthopaedic surgeons. Approximately 44% of participants had undergone surgery for their osteoarthritis.

**Table 11.***Participant Disease Characteristics*

Disease characteristic	Response Count ( <i>n</i> = 189)	Percentage of sample
Typical weekly physical activity:		
30 minutes or less	13	6.8%
About 1 hour	22	11.6%
About 2 hours	39	20.6%
More than 2 hours	115	60.8%
Smoker:	8	4.2%
Comorbidities reported:		
Heart disease (for example angina, heart attack or heart failure)	26	13.7%
High blood pressure	74	39.2%
Problems caused by a stroke	4	2.1%
Leg pain when walking due to poor circulation	20	10.6%
Lung disease (for example asthma, chronic bronchitis or emphysema)	15	7.9%
Diabetes	17	9.0%
Kidney disease	5	2.6%
Diseases of the nervous system (for example Parkinson's disease or multiple sclerosis)	1	0.5%
Cancer (within the last five years)	14	7.4%
Depression	28	14.8%
Joints affected:		
Hip: one side / both sides affected	98	47.1%
Knee: one side / both sides affected	145	76.7%
Spine	53	28.0%
Hands	73	38.6%
Shoulders	20	10.5%
Feet	30	15.8%
Diagnosed by a doctor:	180	95.2%
Healthcare providers consulted in the past 12 for OA		
Health educator/peer support group	43	22.8%
Dietician	8	4.2%
Physiotherapist	96	50.8%
General practitioner	147	77.8%
Rheumatologist	19	10.1%
Orthopaedic surgeon	82	43.4%
Alternative health practitioner	14	7.4%
Musculoskeletal Specialist	4	2.1%
Hydrotherapy	4	2.1%
Other*	25	13.2%
Has had surgery for hip and/or knee OA	84	44.7%
	<u>Mean</u>	<u>SD</u>
Duration of symptoms (years: <i>n</i> = 183)	9.9	13
BMI (kgs/m <sup>2</sup> )	27.7	6.3

Note: BMI (kgs/m<sup>2</sup>) = Body Mass Index (kilograms per metre squared), OA = Osteoarthritis, SD = Standard Deviation. \*Other: acupuncturist (*n* = 3), osteopath (*n* = 3), chiropractor (*n* = 2), keep well clinic (*n* = 2), radiologist (*n* = 2), massage therapist (*n* = 1), Pilates instructor (*n* = 1) and podiatrist (*n* = 1).

Over half of the participants ( $n = 115$ , 60.8%) were taking some form of medication for their osteoarthritis (Table 12). The most frequently taken medications were simple analgesics, opiate-based analgesics and non-steroidal anti-inflammatory drugs. Forty-one percent of participants ( $n = 78$ ) reported taking some form of dietary supplement for the osteoarthritis (Table 13). People took a broad range of supplements; the most common being fish oil, glucosamine and chondroitin, magnesium and turmeric.

**Table 12.**

*Medications Participants Currently Taking for Osteoarthritis*

Drug category (listed by frequency count)	Frequency count	Percentage of sample
Simple analgesic (i.e. Paracetamol, Panadol)	91	48.1%
Non-steroidal anti-inflammatory drugs (i.e. naproxen, ibuprofen, brufen, ibuprofen, diclofenac)	44	23.3%
Opiate-based analgesics (i.e. tramadol, codeine, morphine)	37	19.6%
Tricyclics (i.e. amitriptyline, nortriptyline)	6	3.2%
Cox-II inhibitors (i.e. Celebrex, Arcoxia)	5	2.6%
Steroid based anti-inflammatories (prednisone)	2	1.0%
Other (gabapentin / Norflex)	2	1.0%

**Table 13.**

*Dietary Supplements Participants Currently Taking for Osteoarthritis*

Dietary supplement (listed by frequency count)	Frequency count	Percentage of sample
Fish oil	41	22.7%
Glucosamine and chondroitin	31	16.4%
Magnesium	14	7.4%
Turmeric tablets	9	4.8%
Arthrem	6	3.2%
Joint formula	4	2.1%
Flax seed oil	4	2.1%
B vitamins	2	1.0%
Green lip mussels	2	1.0%
Vitamin C	2	1.0%
Other*	5	2.5%

Note: \*Other = deer velvet, zinc, Manuka honey, Risedronate and ginger.

### 8.3.3 Section 2: Health, illness and treatment beliefs questionnaires about hip and/or knee joint osteoarthritis

#### 8.3.3.1 *The Illness Perception Questionnaire - Revised*

*IPQ-R section one (Illness Identity).* The number of people who completed this section varied from item to item (Table 14). One or more participants attributed each of listed symptoms to osteoarthritis. However, five symptoms were more commonly attributed to osteoarthritis than the others (reported by 50% or more of the participants), pain, fatigue, joint stiffness, sleep difficulties and a loss of strength.

*IPQ-R section two (Illness Beliefs).* One hundred and seventy-two complete data sets were analysed. Table 15 shows the individual item group mean and the standard deviation scores. The mean score for most of the items of the section was between 2 and 4. However, five items relating to the length of time that participants believed they would have osteoarthritis, scored outside of this range. The correlation matrix indicated that the data were suitable for principal component analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was .808, above the recommended value of .6, and Bartlett's Test of Sphericity was significant ( $\chi^2(701) = 3543.33, p < .0001$ ). Principal component analysis was completed using the previously identified seven-factor solution (Moss-Morris et al., 2002), with the factors explaining 62.24% of the total variance. Table 15 shows the individual item loadings on the first principal and the rotated item loadings. The Cronbach's alpha for the entire scale was acceptable (.78). Table 16 shows the individual subscale titles, Cronbach's alpha scores, mean group scores and standard deviation scores. Eigenvalues ranged from 7.56 to 1.49. Most factors were named in keeping with the findings of Moss-Morris et al. (2002: Table 16. However, factor 6 differed and was called '*Negative treatment expectations*'. Subscale group mean scores ranged from 2.54 to 4.17, and the internal consistency of six of the subscales was acceptable.

*IPQ-R section three (Causal Beliefs).* One hundred and sixty-nine complete data sets were analysed. Participants most frequently attributed the cause of their osteoarthritis to ageing, accident or injury and hereditary (Table 17. The correlation matrix indicated that the data were suitable for principal component analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was .853, above the recommended value of .6, and Bartlett's Test of Sphericity was significant ( $\chi^2(153) = 1283.79, p < .0001$ ). While,

PCA identified a rotated four-factor solution (Eigenvalues: 6.54, 1.39, 1.20, and 1.18), there was no conceptual congruency to the factors (Table 17. Additionally, observation of the scree plot identified that only one factor was located to the left of the elbow. Therefore, subscale analysis was not completed.



**Table 14.***IPQ-R Illness Identity Scale: Participants' Reported Symptoms*

Symptom	Symptom experienced	Symptom attributed to osteoarthritis
Have you experienced any of the following symptoms since your diagnosis with osteoarthritis?		
Pain	163/182 (89.6%)	134/144 (93.1%)
A sore throat	39/155 (25.5%)	1/105 (1.0%)
Nausea	31/170 (18.2%)	4/101 (4.0%)
Breathlessness	37/157 (23.6%)	9/98 (9.2%)
Weight loss	18/154 (11.7%)	7/92 (7.6%)
Fatigue	92/159 (57.9%)	62/118 (52.2%)
Joint stiffness	161/170 (94.7%)	128/139 (92.1%)
Sore eyes	48/155 (31.0%)	4/102 (3.9%)
Wheeziness	26/157 (16.6%)	3/95 (3.2%)
Headaches	50/151 (33.1%)	4/109 (3.7%)
An upset stomach	44/155 (28.4%)	7/106 (6.6%)
Sleep difficulties	107/159 (67.3%)	70/123 (56.9%)
Dizziness	33/154 (21.4%)	8/99 (8.1%)
A loss of strength	127/166 (76.5%)	93/123 (75.6%)

Note: IPQ-R = Illness Perception Scale - Revised.

**Table 15.***Individual Item Group Mean and Standard Deviation Scores, and Rotated Seven Factor Analysis of the IPQ-R Illness Beliefs Scale*

Item	Group mean (SD)	Item loading	Factor***						
			1	2	3	4	5	6	7
I get depressed when I think about my osteoarthritis	2.76 (1.12)	.68	<b>.74</b>						
My osteoarthritis makes me feel angry	2.57 (1.06)	.50	<b>.72</b>						
When I think about my osteoarthritis, I get upset	2.58 (1.09)	.68	<b>.72</b>						
My osteoarthritis has serious financial consequences	2.73 (1.22)	.51	<b>.71</b>						
My osteoarthritis makes me feel afraid	2.49 (1.06)	.55	<b>.70</b>						
My osteoarthritis causes difficulties to those who are close to me	2.99 (1.16)	.55	<b>.69</b>						
Having this osteoarthritis makes me feel anxious	2.70 (1.07)	.55	<b>.68</b>						
My osteoarthritis strongly affects the way others see me	2.73 (1.22)	.54	<b>.67</b>						
My osteoarthritis has major consequences on my life	3.90 (1.04)	.67	<b>.56</b>	.46					
My osteoarthritis does not have much effect on my life*	2.02 (1.03)	.75	<b>.55</b>						
My osteoarthritis will last for a long time	4.42 (0.81)	.47		<b>.87</b>					
I expect to have this osteoarthritis for the rest of my life	4.38 (0.85)	.43		<b>.80</b>					
My osteoarthritis is likely to be permanent rather than temporary	4.28 (1.03)	.44		<b>.66</b>					
This osteoarthritis will pass quickly*	1.63 (0.98)	.49		<b>.64</b>					
My osteoarthritis will improve in time*	2.19 (1.04)	.39		<b>.57</b>					
My osteoarthritis is a serious condition	3.67 (1.01)	.66	.48	<b>.54</b>					
I don't understand my osteoarthritis	2.31 (1.11)	.32			<b>.88</b>				
My osteoarthritis doesn't make any sense to me	2.33 (1.10)	.36			<b>.84</b>				
My osteoarthritis is a mystery to me	2.31 (1.11)	.28			<b>.81</b>				
The symptoms of my condition are puzzling to me	2.60 (1.11)	.37			<b>.76</b>				
I have a clear picture or understanding of my osteoarthritis*	3.57 (1.00)	.18			<b>.60</b>				
The course of my osteoarthritis depends on me	3.33 (1.08)	-.45				<b>.79</b>			
What I do can determine whether my osteoarthritis gets better or worse	3.57 (1.02)	-.36				<b>.72</b>			
I have the power to influence my osteoarthritis	3.45 (1.15)	-.47				<b>.71</b>			
There is a lot which I can do to control my symptoms	3.40 (1.01)	-.46				<b>.55</b>			
My osteoarthritis will last a short time**	1.63 (0.98)	-.36							

Item	Group mean	Item loading	Factor***						
			1	2	3	4	5	6	7
I go through cycles in which my osteoarthritis gets better and worse	3.42 (1.04)	.01					<b>.85</b>		
My symptoms come and go in cycles	3.24 (1.06)	-.02					<b>.83</b>		
The symptoms of my osteoarthritis change a great deal from day to day	3.36 (1.05)	.13					<b>.79</b>		
My OA is very unpredictable	2.94 (1.07)	.12					<b>.79</b>		
Nothing I do will affect my osteoarthritis	2.10 (0.95)	.27						<b>.75</b>	
My actions will have no effect on the outcome of my osteoarthritis	2.32 (1.05)	.35						<b>.69</b>	
There is nothing which can help my condition	2.28 (0.97)	.35						<b>.60</b>	-.46
My osteoarthritis does not worry me**	2.45 (1.02)	-.39							
The negative effects of my osteoarthritis can be prevented (avoided) by my treatment	2.45 (1.02)	-.39							<b>.66</b>
My treatment can control my osteoarthritis	3.24 (0.98)	-.38							<b>.54</b>
My treatment will be effective in curing my osteoarthritis	2.40 (1.10)	-.23							<b>.49</b>
There is very little that can be done to improve my osteoarthritis**	2.77 (1.09)	.37							

Note: IPQ-R = Illness Perception Scale - Revised, OA = Osteoarthritis, SD = Standard Deviation. \* indicates where scoring of the item was reversed so that it fitted conceptually with the other items in the subscale. \*\* indicates items that did not load onto any factor with a score greater than .45. Scores shown in bold indicate those that comprise the factor. \*\*\* Factor names: 1 = *Emotional and social impact*, 2 = *Expected timeline*, 3 = *Disease coherence*, 4 = *Personal control*, 5 = *Symptom predictability / cyclic pattern*, 6 = *Negative treatment expectations*, 7 = *Treatment control*.

**Table 16.**

*IPQ-R Illness Beliefs Scale Subscale Titles, Mean Scores, Cronbach's Alpha Scores, Eigenvalues and Percentage of Variance Explained*

Subscale (Factor) number	Subscale title	Subscale mean score (SD)	Cronbach's alpha	Eigenvalues	Percentage of variance explained
1	Emotional and social impact	2.95 (0.78)	.89	7.56	19.89
2	Expected timeline	4.17 (0.66)	.80	4.65	12.24
3	Disease coherence	2.54 (0.77)	.88	3.24	8.52
4	Personal control	3.44 (0.83)	.78	2.75	7.24
5	Symptom predictability / cyclic pattern	3.24 (0.88)	.85	2.28	5.99
6	Negative treatment expectations	3.24 (0.79)	.71	1.69	4.45
7	Treatment control	2.84 (0.80)	.63	1.49	3.93

Note: IPQ-R = Illness Perception Scale-Revised, SD = Standard Deviation.

**Table 17.***Individual Item Group Mean and Standard Deviation Scores, and Rotated Four Factor Analysis of the IPQ-R Cause Beliefs Scale*

	Group mean (SD)	Item loading	1	2	3	4
My emotional state e.g. feeling down, lonely, anxious, empty	1.87 (0.98)	.82	<b>.79</b>			
Pollution in the environment	1.85 (0.87)	.75	<b>.76</b>			
Family problems or worries caused my illness	1.79 (0.94)	.75	<b>.75</b>			
My mental attitude e.g. thinking about life negatively	1.85 (0.89)	.77	<b>.67</b>			
Stress or worry	2.13 (1.10)	.60	<b>.65</b>			
Diet or eating habits	2.36 (1.10)	.65	<b>.63</b>			
A germ or virus	1.78 (0.86)	.69	<b>.56</b>	.46		
Overwork	2.60 (1.28)	.52	<b>.50</b>			
Altered immunity	2.21 (1.26)	.67	<b>.49</b>	<b>.43</b>		
Smoking	1.67 (0.88)	.68		<b>.83</b>		
Alcohol	1.79 (0.87)	.66		<b>.81</b>		
My personality	1.77 (0.94)	.73		<b>.67</b>		
Accident or injury	3.48 (1.38)	.15			<b>.73</b>	
My own behaviour	2.70 (1.21)	.47			<b>.65</b>	
Poor medical care in my past	2.04 (0.98)	.53	.49		<b>.54</b>	
Hereditary – it runs in my family	3.37 (1.29)	.22				<b>.65</b>
Aging	3.76 (1.03)	.27				<b>.57</b>
Chance or bad luck	2.50 (1.22)	.28				<b>-.55</b>

Note: IPQ-R = Illness Perception Scale-Revised, SD = Standard Deviation. Scores shown in bold indicate those that comprise the factor.

### 8.3.3.2 *The Adapted Knee Osteoarthritis Fears and Beliefs Questionnaire*

One hundred and sixty-four complete data sets were analysed (Table 18). The scale ranges from 1 to 10, and mean score for most of the items of the section was located between 3 and 8. Only two items scored outside this range. The correlation matrix indicated that the data were suitable for principal component analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was .785, above the recommended value of .6, and Bartlett's Test of Sphericity was significant ( $\chi^2(300) = 1757.49, p < .0001$ ). Principal component analysis using the previously identified four-factor solution (Benhamou et al., 2013) identified factors that collectively explained 54.24% of the total variance. Factors were characterised with the following titles: *Beliefs about consequences on ADL and treatment*; *Beliefs about doctors*; *Beliefs about disease control*; and *Beliefs about treatment efficacy*. Table 18 shows the individual item loadings on the first principal and the rotated item loadings. Four items were discarded because they did not load onto a factor. The Cronbach's alpha for the entire scale was .85, individual subscale Cronbach's alpha scores ranged from .42 to .89 (Table 19). Eigenvalues values ranged from 5.86 to 1.49, and the sample's mean factor scores were all located towards the middle of the scale and varied from 4.23 to 5.49 (Table 19).

**Table 18.**

*Individual Item Group Mean and Standard Deviation Scores, and Rotated Four Factor Analysis of the Adapted KOFBeQ*

Items	Group mean (SD)	Item loading	Factor***			
			1	2	3	4
Because of my knee and/or hip OA, I will soon be unable to walk anymore.	3.64 (2.72)	.77	<b>.87</b>			
Because of my knee and/or hip OA, I will end up in a wheelchair.	3.09 (2.60)	.67	<b>.84</b>			
Because of my knee and/or hip OA, I will depend on others for activities of daily living.	3.98 (2.86)	.76	<b>.84</b>			
Because of my knee and/or hip OA, I will not be able to climb stairs anymore.	4.54 (2.81)	.73	<b>.83</b>			
Because of my knee and/or hip OA, I will have to give up my leisure activities.	4.80 (2.98)	.75	<b>.69</b>			
Because of my knee and/or hip OA, I will have to stop sports activities.	5.48 (2.86)	.70	<b>.62</b>			
Exercises are useless for knee and/or hip osteoarthritis.	2.85 (2.48)	.64	<b>.58</b>			
Surgery is inevitable when you have knee and/or hip osteoarthritis.	5.49 (2.92)	.51	<b>.50</b>			
Physical activities are harmful to knee and/or hip osteoarthritis.*	4.07 (2.73)	.33				
Wet weather makes knee and/or hip osteoarthritis worse.*	6.35 (2.65)	.19				
Doctors and GPs underestimate pain in knee and/or hip osteoarthritis.	5.10 (2.93)	.56		<b>.89</b>		
Doctors and General Practitioners (GPs) are not interested in knee and/or hip osteoarthritis.	4.53 (3.06)	.62		<b>.84</b>		
Doctors and GPs do not have much to propose for knee and/or hip osteoarthritis.	5.52 (2.93)	.56		<b>.81</b>		
General practitioners usually do not refer patients with knee and/or hip osteoarthritis to specialists because osteoarthritis is a common and benign disease.	4.37 (3.01)	.49		<b>.80</b>		
Knee and/or hip osteoarthritis is a fate for which not much can be done.	4.51 (2.70)	.41			<b>.77</b>	
Old age is the main cause of knee and/or hip osteoarthritis.	6.05 (2.56)	.18			<b>.68</b>	
Nothing can be done to modify the progression of knee and/or hip osteoarthritis.	4.87 (2.73)	.45			<b>.65</b>	
Knee and/or hip osteoarthritis cannot be cured.	6.53 (2.87)	.23			<b>.64</b>	
Some diets or food supplementations can prevent knee and/or hip osteoarthritis.	4.54 (2.34)	-.01				<b>.72</b>
Traumas are the main cause of knee and/or hip osteoarthritis.	5.81 (2.54)	.17				<b>.68</b>
Knee and/or hip injections can damage cartilage	4.39 (4.39)	.19				<b>.50</b>

Note: GPs = General Practitioners, KOFBeQ = Knee Osteoarthritis Fears and Beliefs Questionnaire, OA = Osteoarthritis, SD = Standard Deviation. \* indicates items that did not load onto any factor with a score a score greater than .45. Scores shown in bold indicate those that comprise the factor. \*\*\* Factor names: 1 = *Beliefs about consequences on ADL and treatment*, 2 = *Beliefs about doctors*, 3 = *Beliefs about disease control*, 4 = *Beliefs about treatment efficacy*.

**Table 19.**

*Adapted KOFBeQ Subscale Titles, Mean Scores, Cronbach's Alpha Scores, Eigenvalues and Variance Explained Percentages*

Subscale (factor) number	Subscale title	Subscale mean score (SD)	Cronbach's alpha	Eigenvalues	Percentage of variance explained
1	Beliefs about consequences on ADL and treatment	4.23 (2.09)	.89	5.86	26.66
2	Beliefs about doctors	4.88 (2.58)	.89	2.50	11.36
3	Beliefs about disease control	5.49 (1.98)	.70	2.08	9.46
4	Beliefs about treatment efficacy	4.91 (1.60)	.42	1.49	6.76

Note: ADL = Activities of Daily Living, KOFBeQ = Knee Osteoarthritis Fears and Beliefs Questionnaire, SD = Standard Deviation.



### 8.3.4 Section 3: Perceived disease severity and functional ability

#### 8.3.4.1 The P4 Questionnaire

One hundred and sixty-four full data sets were analysed. Total pain scores ranged from 4 to 35 out of a maximum score of 40. The group's mean score was 22.2, with a standard deviation of 8.5.

#### 8.3.4.2 The Hip disability and Osteoarthritis Outcome Score

Participants completed either the HOOS or the KOOS. Therefore, sixty full data sets were analysed. Total HOOS scores ranged from 14.5 to 98 out of the maximum score of 100, the group's mean (SD) score for the entire scale was 54.5 (19.7), and the subscale scores ranged from 38.1 to 59.1 (Table 20). The Cronbach's alpha score for the total HOOS scale was acceptable (.97), as were Cronbach's alpha scores for the six subscales (Table 20).

#### 8.3.4.3 The Knee Osteoarthritis Outcome Score

One hundred and four complete data sets were analysed. Total KOOS scores ranged from 15.5 to 92.9 out of a maximum score of 100, the group's mean (SD) score was 54.9 (16.9), and the subscale scores ranged from 33.5 to 55.6 (Table 20). The Cronbach's alpha score for the total KOOS scale was acceptable (.96). Except for the *symptoms* subscale, the internal consistency for each of the other subscales was acceptable (Table 20).

**Table 20.**

*HOOS and KOOS Perceived Function Subscale Group Mean Scores and Cronbach's Alpha Scores*

Subscale	HOOS		KOOS	
	Subscale mean score (SD)	Cronbach's alpha	Subscale mean score (SD)	Cronbach's alpha
Symptoms	53.5 (20.5)	.79	55.6 (9.2)	.24
Pain	57.5 (19.3)	.91	46.8 (25.0)	.91
ADL	59.1 (21.0)	.96	35.3 (20.6)	.96
Sport and recreation	38.7 (24.4)	.88	33.5 (25)	.90
Quality of life	38.1 (20.0)	.85	40.0 (18.0)	.81

Note: ADLs = Activities of Daily Living, KOOS = Knee Osteoarthritis Outcome Score, HOOS = Hip disability and Osteoarthritis Outcome Score, SD = Standard Deviation.

## 8.4 Discussion

The results of this study suggest the IPQ-R and the adapted KOFBeQ have the potential to be valid and reliable measures of osteoarthritis health, illness and treatment beliefs for people with hip and/or knee osteoarthritis in New Zealand. However, limitations with both questionnaires were identified, meaning that if either questionnaire is to be used to measure people's osteoarthritis beliefs in the future, it would need further development so that it is better suited for this purpose. Beyond these main findings, there are some points that merit further discussion in the context of this thesis and current research. The points are discussed as they relate to the sections of the survey questionnaire. The strengths and limitations of the study are outlined followed by conclusions and recommendations.

### 8.4.1 Section 1: Demographic and disease characteristics

The majority of participants' demographic and disease characteristics such as age, BMI and duration of osteoarthritis symptoms, are similar to findings reported in previous osteoarthritis health beliefs studies (Benhamou et al., 2013; Bijsterbosch et al., 2009; Holden et al., 2012). However, three aspects of the participants' demographic and disease characteristics may have influenced the findings from this study, participants' gender, ethnicity and reported physical activity level.

First, considerably more women than men completed the survey. While osteoarthritis tends to be more prevalent in women than men, the identified difference cannot be fully explained by disease prevalence (Hochberg et al., 2015). This discrepancy may be explained by the manner in which the survey was advertised. The survey was primarily promoted through Arthritis New Zealand. Eighty-three percent of Arthritis New Zealand members are female (S. Kirby [CEO Arthritis New Zealand], personal communication, May 2017). Hence, more women may have seen the study's advertisements and chosen to participate.

Second, the vast majority of participants (94.3%) described their ethnicity as New Zealand European, and this percentage is not representative of the ethnic diversity of New Zealand (69% of the population: Ministry of Health, 2015). Osteoarthritis does not typically affect people of one ethnicity over another when other risk factors such as occupation and obesity rates are accounted for (Hochberg et al., 2015; Ministry of Health, 2015). Ethnic minorities, particularly Maori, are often disproportionately

underrepresented in New Zealand Health Research (Ministry of Health, 2015). The limited ethnic diversity of the participants may be partially explained by the ethnic mix of Arthritis New Zealand members, as 72% of members describe themselves as New Zealand Europeans (S. Kirby [CEO Arthritis New Zealand], personal communication, May 2017). Therefore, the findings of this study cannot be assumed to be representative of the beliefs of New Zealanders of all ethnicities.

Third, approximately 81% of participants indicated that they complete two or more hours of physical activity per week. This percentage is especially high, and in contrast to the Ministry of Health figures that show less than 40% of New Zealanders over the age of 65 years engage in this level of physical activity (Ministry of Health, 2015). There are two possible reasons for this finding. One, participants may be aware of the benefit of physical activity for people with osteoarthritis and consequently engage in more physical activity than the general population, as has been reported previously (Herbolsheimer et al., 2016). Two, the finding may represent a response bias. Participants may have inadvertently over reported their level of physical activity because higher levels of physical activity are known to be socially desirable or because they are reporting the activity they have been advised to complete by healthcare professionals (Brenner & DeLamater, 2014; Taber et al., 2009).

#### **8.4.2 Section 2: Health, illness and treatment beliefs questionnaires about hip and/or knee joint osteoarthritis**

The results of the IPQ-R and the adapted KOFBeQ indicate that both questionnaires have the potential for use in the context of osteoarthritis beliefs, but further development of each questionnaire is needed.

##### **8.4.2.1 *Illness Perception Questionnaire – Revised***

The symptoms (IPQ-R *Illness Identity* section) participants most commonly attributed to their osteoarthritis were pain, joint stiffness and loss of strength; all of which are symptoms typically reported by people with osteoarthritis (Hochberg et al., 2015). This finding is not unexpected and may be explained by the high percentage of participants whose osteoarthritis was diagnosed by their GP (95.2%), as the diagnostic process probably included an explanation of common signs and symptoms.

The results of the PCA of the *Illness Beliefs* section of the IPQ-R suggest that the questionnaire may be appropriate for measuring osteoarthritis health, illness and treatment beliefs held by New Zealanders living with hip and/or knee osteoarthritis. As the IPQ-R is underpinned by the Common Sense Model (CSM), the findings suggest that the CSM may explain some of the beliefs of these people. The factor analysis of the data from the present study supported a seven-factor solution, in keeping with the findings of previous research (Bijsterbosch et al., 2009; Kaptein et al., 2010; Moss-Morris et al., 2002). Furthermore, the items contained within each subscale (factor) are similar to items of the corresponding subscale identified by Moss-Morris et al. (2002). Therefore, six of the subscale names relate to those proposed by Moss-Morris et al. (2002). This findings adds weight to the utility of the questionnaire with people with hip and/or knee osteoarthritis, the internal consistency of six of the seven subscales was acceptable.

The factors that differed between the present study and that of Moss-Morris et al. (2002) were respectively called *Negative treatment expectations* and *Consequences*. The reasons for the differences between the two studies are not clear but may relate to differences in the participant inclusion criteria. The study by Moss-Morris et al. (2002) included people with a broad range of different pathologies, such as chronic fatigue syndrome and cardiac failure, whereas the present study only included people with hip and/or knee osteoarthritis. Additionally, Moss-Morris et al. (2002) indicated that they would expect to see subscale variations with different groups of people, due to differences in illness perceptions associated with different chronic illnesses. In contrast to the findings of Moss-Morris et al. (2002), the internal consistency of the seventh factor of the present study (*Treatment control*) was unacceptable. However, this finding may suggest an inconsistency in the beliefs held by participants about the efficacy of treatment for hip and/or knee osteoarthritis, or simply the limited number of items forming the factor (three)(Portney & Watkins, 2009).

The findings from six of the seven *Illness Beliefs* section subscales indicate that overall the participants did not appear to have strong positive or negative beliefs about the constructs. However, the group mean score of *Expected timeline* subscale was located towards to higher end of the scale. This result suggests that most participants agreed or strongly agreed with the statements about the expected timeline of the disease. Analysis of the items contained within the subscale showed that these items describe osteoarthritis as a chronic disease that people will have for the rest of their life. This

finding is congruent with the pathology and the expected disease progression of osteoarthritis, and with previous research (Hochberg et al., 2015; Kaptein et al., 2010).

The results of the *Causal Beliefs* section of the IPQ-R show that the participants' beliefs about the causes of their osteoarthritis were generally in keeping with current evidence (Hochberg et al., 2015; Palazzo et al., 2016). The key associated causative factors identified were hereditary factors, accident or injury and ageing. In contrast to previous research, participants did not report idiosyncratic causes for osteoarthritis such as, exposure to cold weather or playing bare footed as a child (Turner & Turner, 2007). Two factors may explain these results. First, participants were recruited via Arthritis New Zealand events, newsletter and website. Therefore, they may have been informed about the causes of osteoarthritis from previous contact with the group. Second, most of the participants had received a diagnosis of osteoarthritis from their GP, and many had consulted with other health care professionals in the 12 months prior to completing the survey. Thus information about cause could have come from these consultations, as research suggests that many people acquire health knowledge from consultation with healthcare professionals (Crum & Zuckerman, 2017).

Analysis of the data collected with the *Causal Beliefs* section of the IPQ-R did not identify an interpretable principal component structure, in contrast to the findings of Moss-Morris et al. (2002). This difference may again relate to the differences between the inclusion criteria of the two studies. Additionally, it may indicate the usual causative factors could be well known, meaning that some of the other symptoms were not reported and hence no principal component structure was identifiable. Kaptein et al. (2010) and Bijsterbosch et al. (2009) both reported the using the existing subscale structure of the IPQ-R *Cause* scale with people with knee osteoarthritis. However, neither study reported the internal consistency of the subscales. Therefore, no comparison can be made between the present study and the findings reported in these two studies (Bijsterbosch et al., 2009; Kaptein et al., 2010).

#### **8.4.2.2 Adapted Knee Osteoarthritis Fears and Beliefs Questionnaire**

The results of the adapted KOFBeQ indicate that the questionnaire may be suitable for use with people with knee and/or hip osteoarthritis in New Zealand. Additionally, the factor analysis provided some support for the four-factor structure proposed by Benhamou et al. (2013). The four factors found in the present study were called: (i) *Beliefs about consequences on ADL and treatment*, (ii) *Beliefs about doctors*, (iii)

*Beliefs about disease control* and, (iv) *Beliefs about treatment efficacy*. Many similarities were observed between the items comprising each first three identified factors of the present study and that of Benhamou et al. (2013), but the fourth factor differed considerably. In the present study, the fourth factor was characterised as *Beliefs about treatment efficacy*, whereas Benhamou et al. (2013) characterised their fourth factor as *Fears and beliefs about sports and leisure*. Furthermore, should the questionnaire be used in the future, development would be needed to improve the low internal consistency of the fourth subscale.

Possible reasons for this difference may relate to differences in the inclusion criteria of each study. The study by Benhamou et al. (2013) was completed in France and only included people with knee osteoarthritis, whereas the present study was in New Zealand and included people with hip and/or knee osteoarthritis. The different cultures and disease sites may have affected the results. Additionally, the conceptual association of the items of the fourth adapted KOFBeQ subscale named *Beliefs about treatment efficacy* was very poor, as was the Cronbach's alpha score (.42) of the subscale. This result may be reflective of the limited number of items included in the factor (Portney & Watkins, 2009).

The adapted KOFBeQ subscale scores indicate that as a group, the participants held beliefs that were neither strongly in agreement or disagreement with the items comprising each subscale. Therefore, overall the participants did not appear to have strong positive or negative beliefs about the constructs. Additionally, most of the individual item scores were located towards the middle of the Likert scale. However, two items differed from this. While it is not usual to discuss individual item scores, both scores merit mention because of the focus of this thesis. The item participants most strongly agreed with related to the belief that wear and tear caused osteoarthritis. This finding supports the notion that a biomechanical view of the disease may inform the beliefs of the participants (Hunter et al., 2008; Morden et al., 2011). In contrast, the item that participants most strongly disagreed with related to limitations to the benefit of exercise, indicating that exercise as a form of treatment for their osteoarthritis is highly valued, in keeping with current evidence (Bennell, 2013; Fransen et al., 2015).

### 8.4.3 Section 3: Perceived disease severity and functional ability

The wide range of P4, HOOS and KOOS scores suggests that the data collected were from people with a broad range of perceived disability. Furthermore, the participants' mean subscale scores and Cronbach's alpha scores were similar to those found in previous studies (Collins et al., 2016; Nilsson et al., 2003; Roos & Lohmander, 2003). However, one finding differed from previous research. The Cronbach's alpha scores of the *symptom* subscale of the KOOS was not acceptable (.24). This result may be a product of the sample size (106 participants completed the KOOS) or the limited number of items that form the subscale. Both factors are known to affect the internal consistency of a questionnaire scale (Portney & Watkins, 2009). Conversely, the result may be an anomaly of the study.

### 8.4.4 Strengths and limitations of the study

The study had two strengths. One, the use of established questionnaires (IPQ-R, KOFBeQ, P4, HOOS and KOOS) in the survey increased the credibility and generalizability of the results and allowed for comparison with previous research. Two, the online methods enabled wider dissemination of the survey questionnaire. The study had three limitations. One, the ethnic diversity of the sample was narrow. Hence, the generalizability of the findings to the wider population of New Zealanders living with hip and/or knee osteoarthritis is limited. Two, the survey dropout rate (17.2%) was high. This dropout rate may reflect survey fatigue and likely indicates that the survey was too long for some participants. Three, participant dropout meant that the sample size became less than optimal for the statistical analysis completed. The ideal number of participants required to complete a PCA varies between authors, but customarily more than 200 complete data sets are recommended (Pallant, 2010). Therefore, caution should be applied when interpreting the results of the PCA of the present study.

## 8.5 Conclusions and recommendations

The results of this study suggest that the IPQ-R and the adapted KOFBeQ both have merit as questionnaires, but neither is completely suited to measuring health, illness and treatment beliefs in people with hip and/or knee osteoarthritis. However, the adaptation of the KOFBeQ for use with individuals with hip and/or knee osteoarthritis was promising. Given that it is considerably shorter than the IPQ-R, the adapted KOFBeQ

may merit further future development to improve reliability. Additionally, the results suggest that participants held beliefs about the common symptoms and causes, and the expected timeline of hip and knee osteoarthritis that are in keeping with current literature. In contrast, there appears to be limited clarity about treatment beliefs.



## **Chapter 9 An exploration of the osteoarthritis health, illness and treatment beliefs held by New Zealand clinicians: A qualitative descriptive study**

### **9.1 Research questions**

The two research questions were:

What are the common health, illness and treatment beliefs held by New Zealand clinicians about the treatment of people with hip and knee osteoarthritis?

Do these beliefs align to an existing model or models of clinicians' health, illness and treatment beliefs?

### **9.2 Methods**

#### **9.2.1 Study design**

This was a naturalistic study design using a qualitative descriptive methodology. Data were collected at one time-point by face-to-face interviews and analysed by the thematic analysis methods, as described by Braun and Clark (2006).

#### **9.2.2 Participant selection**

People were recruited from two of health professions (physiotherapy and medical practitioners with expertise in general practice, rheumatology, sports medicine or orthopaedic surgery), and with a range of demographic and occupational characteristics. Recruitment was via purposeful and snowball sampling. Clinicians were approached because they appeared to have experience with, and knowledge about, treating people with osteoarthritis. On completion of the interview, participants were asked if they could recommend other clinicians whose clinical experience could be valuable. These health professions were chosen because it is common for these clinicians to be involved in the diagnosis and treatment of people with osteoarthritis of the knee and/or hip. People met the inclusion criteria if they were (i) practising in New Zealand as a registered health professional, and (ii) had treated a patient with hip and/or knee osteoarthritis in the past six months. Participants were also required to have a good

command of the English language to take part in the interview. All participants were required to provide written informed consent.

### 9.2.3 Measures

Data collection occurred by way of a short demographic and occupational characteristics form and a face-to-face individual interview.

*Demographic and occupational characteristics form.* Participants completed a demographic and occupational characteristics form that included questions regarding age, gender, occupation, experience, postgraduate qualifications, and if they worked in public and/or private practice (Appendix J).

*Individual face-to-face interviews.* The interviews were conducted in a semi-structured conversational style, guided by the interview schedule (Appendix K). Interviews aimed to provide rich descriptive data by inviting discussion about particular events and moments of treating people with hip and/or knee osteoarthritis. The interview schedule was developed from the findings of current literature regarding best practice clinical management of osteoarthritis and clinicians' beliefs about the treatment of osteoarthritis (Chevalier et al., 2004; Conrozier et al., 2008; Fransen & McConnell, 2008; Holden et al., 2009; Zhang et al., 2008). However, questions were not limited to those included on the interview schedule. When appropriate, further questions derived from the stories and notions presented by the participants, giving them the freedom to discuss potential new issues or concepts.

### 9.2.4 Procedure

The Auckland University of Technology Ethics Committee granted ethical approval for the study (AUTEC approval number 14/62: Appendix L). The study was advertised to potential participants through local professional organisation newsletters. Clinicians interested in participating, who met the inclusion criteria, were enrolled. First, participants read the participant information form (Appendix M) and then completed the consent form (Appendix N). Participants kept a copy of both forms. Next, they completed the demographic and disease characteristics form. Interviews were between 15 and 60 minutes in duration, conducted between May and December 2014 and held at a location that suited the participant and the doctoral candidate, and digitally recorded.

Participant recruitment ceased when it appeared that subsequent interviews were not eliciting substantial new themes or notions.

### **9.2.5 Data processing, data analysis and preservation of rigour**

The steps that were undertaken to process and analyse the data, and ensure the rigour of the findings were the same as those described in Chapter 6. Quotations included in the findings section of this study are identified by the participant number and the participant's profession. The participant's profession was included as it was felt that it would help contextualise each quotation.

## **9.3 Findings**

### **9.3.1 Participant characteristics**

Eleven clinicians participated in the study. The participants came from different professions (general practice (GP), orthopaedic surgery, physiotherapy, rheumatology, sports medicine), and the duration of their clinical experience ranged from six months to 40 years (mean duration = 12.3 years [SD = 12.1]). Table 21 shows the demographic and occupational histories of all participants. Eight participants held postgraduate or specialist qualifications that related to their profession. Three participants were female, and eight were male. Seven participants worked in private practice, one worked in the public system, and three worked in both private and public practice.

**Table 21.***Participants' Demographic and Occupational History Characteristics*

Participant number	Gender	Age (years)	Occupation	Year first qualified	PG or specialist qualifications	Years treating osteoarthritis	Employment setting
1	Female	28	Physiotherapist	2009	PG Cert.	5.5	Private
2	Female	22	Physiotherapist	2014	Nil	0.5	Private
3	Male	33	Physiotherapist	2002	MHSc.	12	Private
4	Male	38	Orthopaedic surgeon	1999	Surgical Fellowship	5	Private and public
5	Male	43	Physiotherapist	1999	MHSc.	10	Private
6	Male	39	Sports physician	2001	Sports Medicine Fellowship	6	Private
7	Male	66	Orthopaedic surgeon	1974	Surgical Fellowship	40	Private and public
8	Female	37	General practitioner	2003	Nil	11	Private and public
9	Male	28	General practitioner	2012	Nil	2	Private
10	Male	57	Rheumatologist	1980	FRACP	30	Public
11	Male	36	Physiotherapist	2000	PG Dip.	13	Private

Note: PG = Postgraduate, MHSc. = Masters of Health Science, FRACP = Fellow of the Royal Australasian College of Physicians, Dip. = Diploma, Cert. = Certificate.

### 9.3.2 Interview findings

Four themes were identified in the data; each theme was comprised of associated interconnected notions. The themes were named (i) *Matching each patient's signs and symptoms*; (ii) *Anticipating what patients think*; (iii) *Enabling patients to understand their osteoarthritis and find their treatment path*; and (iv) *Understanding that treatment only works when everyone is engaged*.

#### 9.3.2.1 Theme 1: *Matching each patient's signs and symptoms*

Many participants (clinicians) described their beliefs about how patients with osteoarthritis commonly present and how they categorise these patients. Participants indicated that placing patients into categories guided their treatment decisions. Many participants acknowledged that osteoarthritis could be complicated, due to the weak association between patients' reported symptoms, findings of their physical assessment and their X-ray results. *'Osteoarthritis is never simple. Some patients can have a poor looking joint on X-ray and be pain-free, whereas others can have a really good looking joint on X-ray and have a lot of pain'* (participant 1, physiotherapist). Such mismatches appeared to make it challenging for clinicians to predict treatment outcomes for some patients.

*I use the physical examination to confirm the extent of their condition and an X-ray to confirm the severity of the pathology. If the X-ray matches their signs and symptoms, you can start talking to them about treatment outcomes with some confidence. When there is a mismatch between these things, it is tough to know what to do because you have a patient whose symptoms aren't going to be helped by an operation, I see a lot of these people* (participant 7, orthopaedic surgeon).

Some participants stated that they believed a patient's personality might explain the mismatch between X-rays, signs and symptoms. *'I feel that patients presenting with pain from their osteoarthritis experience pain differently to those that don't. I think they have a slightly different personality. Whereas, other patients are stoical and never complain about the pain'* (participant 8, GP).

Some participants talked about how a patient's age influenced clinical decision making about osteoarthritis treatment. Many categorised patients as either *young* or *old*.

Participants stated that they often focused more of their energy on younger patients, as they

believed that the ramifications of the disease are greater for these people and they may benefit more from treatment.

*I put people with osteoarthritis into one of two categories. You've got the younger ones, who are usually in the earlier stage of the disease, and then there are the older ones. The younger patients are the ones that I tend to be a little more concerned about. Because they're developing it early, it'll have long-term consequences for all kinds of things in their lives (participant 8, GP).*

*For the 94-year-old the ship's sailed really. But if I see younger people with osteoarthritis, particularly if I see people in their late 40s and early 50s who have symptoms and have visible changes on the X-ray, I get worried (participant 6, sports physician).*

The differences in beliefs that clinicians have about *young* and *old* patients may be influenced by discrepancies in how people of different ages or generations interact with their health professionals, or from clinicians' being dismissive of an older patient's symptoms. Older patients may be less demanding of healthcare professionals because they see osteoarthritis as part of getting older or because they come from a more stoical generation, as highlighted by the quotation below:

*Older people don't generally complain about it, even though they could be in horrific pain, and really debilitated by it. They don't come to me and complain about osteoarthritis. You have to dig deep and ask them about it. However, the younger ones tend to come in with the problem, put it on the desk and say, fix it for me (participant 8, GP).*

While participants stated that they had a particular concern for their younger patients with osteoarthritis, they also referred to these people being more challenging to engage in rehabilitation. Some believed the challenge was that younger people often had busier lives than older people, and therefore struggled to make the necessary long-term lifestyle and behaviour changes.

*Often younger osteoarthritis patients have families; they have busy jobs, they just have less time in the day to exercise. What time they do have is spent with their kids. Therefore, the challenge is giving them an exercise program which fits into their day. Especially women who are mums because mums are really busy. I find mums struggle to get time to exercise. Dads seem to be able to fit exercise in more easily. Maybe it's a cultural thing (participant 6, sports physician).*

### 9.3.2.2 Theme 2: *Anticipating what patients think*

The majority of the participants stated that all patients arrive with preconceived views and expectations about their symptoms and potential treatments. Additionally, participants alluded to some of these beliefs being incorrect or misconceived. These misconceptions included beliefs concerning the disease process and expectations of the condition, as highlighted by the following quotations.

*We all have our own mythology about a disease. These myths depend on your personal belief system and how you've been brought up. People have misconceptions about every medical condition. The biggest one about osteoarthritis is that it is a wear and tear condition. It's not wear and tear; it's wear and repair. Because most of the pathological process of osteoarthritis relates to abnormal tissue repair (participant 10, rheumatologist).*

*I think some patients think osteoarthritis is a bit of a death knell. It's always going to be getting worse. I don't think they realise that the day before they hurt themselves, flared up the joint and developed their symptoms; they would have had the same radiological changes on X-ray (participant 3, physiotherapist).*

Participants indicated that they believed that patients' beliefs about joint wear and tear affected their views about exercise and physical activity. Participants suggested that some people consider exercise or physical activity as the cause of osteoarthritis.

*People that I speak with who have no idea about knee joints say to me "You must spend all your life putting knee replacements in marathon runners." But I say, "Hang on, marathon runners are not the people who get osteoarthritis in their knee joints. Exercise doesn't wear your knee out. It keeps you fit, it builds up the muscles, these muscles take the load off the joint and protect it" (participant 7, orthopaedic surgeon).*

Likewise, participants suggested that their patients' misconceptions included the suitability and effectiveness of treatments, such as surgery. *I think a lot of people have surgery because they think that it will fix all their problems. They get a joint replacement and then come out of hospital saying "I'm fixed." Surgery is not like that' (participant 2, physiotherapist).*

Participants stated that the reaction to being diagnosed with osteoarthritis differed from person to person. These differences may be due to variations in patients' beliefs about the impact of having osteoarthritis.

*I'd say the reaction is 50-50. Some people freak out at the diagnosis of osteoarthritis and think it's the end of the world. While other people know they have it, but the diagnosis has never been confirmed. Those people are not very bothered (participant 11, physiotherapist).*

Additionally, participants felt that people's context and expectations influenced their reactions. *'In the sports medicine setting, sometimes the word arthritis is almost like the word cancer is in the other settings. It can really confront some people. They sit up and listen when you tell them they've got osteoarthritis' (participant 6, sports physician).*

Participants referred to younger patients experiencing a sense of disbelief at the diagnosis of osteoarthritis. The following comment highlights this;

*He said, "There's something the matter with my knees." I explained, "I think you have some early onset osteoarthritis in your knees. You're in your mid-30s." But he replied, "No, that can't be it. There must be something else going on. There's a real problem with my knees because arthritis can't be the diagnosis." That diagnosis just did not make sense in his head (participant 1, physiotherapist).*

Participants explained that it was not common for patients to present with a clear expectation of what they wanted from the clinicians. Many patients present feeling helpless and in need of direction and assistance.

*Mostly people come to me feeling a bit helpless. They ask "What can we do about my knee because it hurts so much?" I have had the occasional person who thinks they need see a specialist straight away because it's so bad - often they are right [laughter]. But my patients don't really come in demanding anything; they are usually just frustrated and not sure what to do (participant 8, GP).*

However, one participant referred to feeling that patients challenged decisions about surgical treatments more than they used to.

*Some patient's expectations have changed a lot. Patients question their doctors a lot more these days. I think if they don't like what they hear from a surgeon they keep looking until they find someone who will offer them a knee joint replacement (participant 4, orthopaedic surgeon).*



### 9.3.2.3 Theme 3: *Enabling patients to understand their osteoarthritis and find their treatment path*

Participants spoke about their beliefs concerning the clinician's role in the management of osteoarthritis. These discussions are placed into one of two categories; beliefs about their role in the treatment of osteoarthritis, or beliefs about the role of other health professionals.

Regardless of their profession, most participants believed clinicians have three roles that relate to the treatment of people with osteoarthritis. These were to; (i) identify the disease, (ii) educate the patient, and (iii) help the patient navigate the health system. Participants suggested that their first role was to identify the right intervention for the right patient, which was more than simply making a diagnosis.

*Fundamentally we're surgeons. Ultimately what we do is operate on people. But a lot of our time is spent assessing the patient's clinical condition, trying to make an informed diagnosis and deciding if surgery will help them. This appraisal is a critical part of surgical practice that surgeons often forget (participant 7, orthopaedic surgeon).*

The second role was to educate their patients. Patient education was often perceived as essential but time-consuming, as this quotation illustrates:

*I spend a good 15 minutes with the patient showing them the model of the knee. I say, "This is what's happening to the joint. This is what's gone from your joint, and this is why we're going to do what we do". Usually, probably ninety percent of the time, they haven't received an explanation of osteoarthritis before (participant 2, physiotherapist).*

Additionally, participants reinforced the importance of this early interaction, highlighting what they perceived as the worth of effectual patient education.

*In a consultation with someone with osteoarthritis, I'll usually spend two minutes looking at the knee, two minutes looking at the X-ray, and the rest of the session talking to the patient. This conversation can be 10 minutes or longer. Often the diagnosis is very clear, you just need to exclude the other things. Whether my patient leaves the room better or worse off, really depends upon how well I can talk to them about the condition (participant 6, sports physician).*

The third role participants described was that of a healthcare navigator. Participants defined this role as someone who would help the patient organise, prioritise and plan the necessary

treatment. Participants stated that it was important that they help their patients navigate their health care.

*I often spend six consultations navigating the patient through their treatment and helping them deal with setbacks. Because they need to build their confidence again. They've lost all confidence in that joint. If you can get someone to leave your clinic feeling better about their joint, you're already modifying their pain perception, and that's a big part of treatment (participant 6, sports physician).*

*I think patients should manage their osteoarthritis, but I think they need guidance. They need someone to help them progress and update their management programme. Because one exercise program is not going to be good for them for five years. I try to hand the responsibility of management over to them but still offer ongoing support (participant 1, physiotherapist).*

One participant mentioned that adopting the navigator role meant he became more than what he believed was the traditional role of a physiotherapist.

*While it is not traditional physio work, I think it is essential we coach and counsel patients. Using cognitive behaviour therapy is seen by some as outside our scope of practice, but it is very helpful for facilitating patient adherence (participant 5, physiotherapist).*

Furthermore, some participants stated that helping patients navigate the healthcare system, meant customising their treatment approach to each patient and thinking about patient health more holistically, as shown by the following quotation:

*We need to have a quality of life approach to dealing with people with osteoarthritis. A multi-faceted approach. Talk to them about diets, tell them about exercise, look for alternatives that work for them. Because you can tell somebody to go walking, but if they live on a rural highway, they're not going to go out walking. They would have to walk around a paddock, and there would be holes everywhere (participant 8, GP).*

Some participants indicated that a change in practice philosophy was needed to allow clinicians to work more holistically.

*We need to move away from the biomedical model. Yes, we still need to look at the X-ray. But we need to ask other questions too. "What's the psychology or social status of the patient? Are they stressed? Are they getting enough sleep? Are they a resilient type of person?" These things*

*are probably going to be better predictors of how they're going to manage this lifelong condition (participant 3, physiotherapist).*

Participants discussed their beliefs about other healthcare professions. Some said they felt that clinicians from other professions were not aware of what their profession could offer people with osteoarthritis. Furthermore, this was supported by participants who stated that they did not know what other healthcare professionals had to offer.

*You could argue that orthopaedic surgeons are one-trick ponies, but we don't know every surgical technique that they have, and they don't know all the latest evidence-based practice that we have to offer. However, some surgeons just think that physiotherapy has not changed since the 1980s and 1990s. Treatment is TENS [transcutaneous electrical nerve stimulation], ultrasound, and microwave (participant 3, physiotherapist).*

*To be honest, I don't really know what goes on in the Green Prescription programme [nation-wide community-based exercise and physical activity programme]. It's just a word. I don't really know what the content of the programme is. I've thought about asking before, but I don't really have the time to look into it. Asking them, "What are you guys doing with my osteoarthritis patients, what are you saying to them?" (participant 8, GP).*

The need for communication and education among healthcare professionals was suggested as a way of improving the understanding of what different professions have to offer. *'I am usually rushed when I dictate patient letters back to those who refer to us, but I try to educate the referrers. I try to indicate the sorts of things that they can tell their patients (participant 6, sports physician).*

#### **9.3.2.4 Theme 4: Understanding that treatment only works when everyone is engaged**

Participants discussed beliefs about the treatment of osteoarthritis. Treatment referred to things that clinicians applied to the patient or that the patient was advised to do for themselves. Most beliefs about treatment related to one of three interconnected notions; (i) the efficacy of treatment, (ii) that osteoarthritis is uninteresting to treat, and (iii) the challenge of engaging patients in rehabilitation.

All of the participants referred to treatments that they believed were or were not effective. Most participants were emphatic in their belief that exercise and education were the two most effective forms of treatment for people with osteoarthritis. *'Exercise prescription is*

*the treatment I would rate above and beyond anything else that I do. Patient education is probably the next most important thing I can offer them'* (participant 1, physiotherapist).

*There is good evidence to support exercise, even to the extent that exercise should be a mandatory part of all osteoarthritis management. Even if your assessment indicates that they are appropriate for surgery. An essential part of their preoperative management should still be exercise. Maybe you get lucky, and the exercise means you get to put surgery off a bit longer* (participant 7, orthopaedic surgeon).

However, participants held concerns about the effectiveness of some of the exercises that clinicians prescribed to patients with osteoarthritis. Additionally, participants indicated that challenges are created by inconsistencies between treatment responses between patients.

*It is so important to actually strengthen people and not give them exercises that are so low level, they don't actually challenge the person. You do need to start with gentle exercises, but you need to progress them. There are massive differences between muscle activation exercises and strengthening exercises, but I think ninety percent of physiotherapists don't understand the difference* (participant 11, physiotherapist).

*Treating people with osteoarthritis can be easy and challenging because people vary greatly in their responses to treatment. Some people respond well to one treatment. Then you apply the same treatment to the next patient, who appears to present the same, and you have a very different treatment outcome* (participant 11, physiotherapist).

Although, not everyone shared the same confidence in the benefits of exercise.

*I don't really know how far people with osteoarthritis will actually get with exercises. With shoulder patients, there are so many things you can do to help them. The research really supports physiotherapy treatment for shoulder pain. Whereas with osteoarthritis of the knee, all you can do is stretch and strengthen the quadriceps* (participant 2, physiotherapist).

Participants commonly referred to the merits and limitations of surgery as a treatment for osteoarthritis. *'I think joint replacement has been pretty good for a long time, but it is not going to give them a normal knee again'* (participant 4, orthopaedic surgeon).

*The one symptom that we surgeons can most predictably help is the pain. The other symptoms that someone with osteoarthritis might have, such as joint stiffness, instability, muscle weakness, gait problems. These things are*

*not necessarily going to be helped by surgery (participant 7, orthopaedic surgeon).*

Participant 3 highlighted the need to incorporate self-management strategies in the treatment of people with osteoarthritis. He maintained that clinicians should take a big picture perspective and consider lifestyle changes that the patient might need to make.

*As soon as a patient leaves the clinic, their joints are going to stiffen up a little bit again. So treatment needs to include self-management tools that they take home and are specific to them and their interests. By getting them on a bike at home, getting them going to pool classes, encouraging them to think about reducing their body weight, you're thinking about the big picture (participant 3, physiotherapist).*

Some participants discussed the need to conceptualise conservative treatment as more than just the prescription of exercises. They described the need to address other risk factors and to extend treatment beyond the clinical environment, as highlighted by the following quotation:

*The first thing I try to do with a patient who is overweight and is developing the early signs of osteoarthritis is to encourage them to lose weight. Losing weight is hard enough as it is, but it is even tougher when you get pain when you exercise (participant 8, GP).*

Some participants believed that osteoarthritis was a straightforward condition to treat. 'I prefer seeing a person with osteoarthritis of their knee as opposed to a rotator cuff or a spine injury. If it is an osteoarthritis patient, I know it's going to be an easy half hour session' (participant 2, physiotherapist). Others indicated that this perceived simplicity resulted in the condition being perceived as boring or unexciting to treat.

*I think there is an attitude for some clinicians when they know a person has osteoarthritis. They think, "Oh, boring. It's just osteoarthritis. I don't really want to deal with this. This person's not going to get better". I think some clinicians see it as too straightforward and not a challenge, especially new graduates (participant 1, physiotherapist).*

However, one participant indicated that this attitude was potentially driven by a lack of understanding about the condition. He stated that gaining a better understanding of the disease had changed the way he viewed people with osteoarthritis.

*The things patients can do for their osteoarthritis are often so simple but also so rewarding. If you actually do the research on osteoarthritis and its treatment, then these people become some of your most valuable patients. I used to dread these patients but now I think, there are all these things I can offer them (participant 6, sports physician).*

Participants referred to difficulties engaging people with their rehabilitation for their osteoarthritis. *'She just liked coming to physiotherapy for a rub and some strapping; she never did her exercises. I did get to a point where I felt very conflicted about it'* (participant 1, physiotherapist). Additionally, they described the importance of facilitating adherence and potential strategies to get people exercising.

*The key to good quality rehabilitation is educating the patient so that they adhere to it. I do everything in my power to facilitate adherence because even the best clinician can't rehabilitate a patient that doesn't turn up or who gives up before they have completed rehabilitation (participant 6, sports physician).*

*Clearly, there's no easy way to get people exercising. Different things work for different people in different situations. For some people what works is the supportive nature of a course like the Green Prescription programme. For some people, the barrier is starting to exercise, whereas for others it's carrying on with the exercises. It is all individual (participant 10, rheumatologist).*

## 9.4 Discussion

Study participants (clinicians) held a broad range of beliefs about treating people with hip and/or knee osteoarthritis. Findings were grouped into four key themes that related to beliefs about; (i) understanding the symptoms that people with osteoarthritis present with, (ii) the assumptions that clinicians held about patient beliefs, (iii) how they saw their clinical role and the role of other healthcare professionals, and (iv) the beliefs they held about treating people with osteoarthritis. Furthermore, some of the findings appear to relate to existing models of clinicians' beliefs. Beyond these main findings, there are some points that merit further discussion in the context of this thesis. For clarity, these points are discussed theme by theme, and then collectively as they relate to existing clinician beliefs and clinical practice models.

#### 9.4.1 Theme 1: *Matching each patient's signs and symptoms*

A number of participants held assumptions and expectations about the relationship between clinical signs, symptoms and radiographic pathology for people with osteoarthritis. Furthermore, several participants related disability directly to the disease, by expecting patients with more severe symptoms to have greater pathological changes. Thus indicating that some participants hold beliefs about osteoarthritis that are underpinned by a biomechanical or biomedical view of the disease. The assumed association between signs, symptoms and pathology is a key assumption of the Biomedical Model of health, as it is assumed that all disease can be fully accounted for by deviations from normal biology (Engel, 1977; Engel, 1978). However, some participants reported that often symptoms and pathology did not correlate. The discordance between symptoms and radiological changes is well documented, as commonly only half of people with radiographic osteoarthritis have clinical symptoms (Jordan et al., 2007; Neogi et al., 2009; Phan et al., 2005).

In contrast, some participants made statements indicating that they employed an approach to clinical practice congruent with the Biopsychosocial Model, both regarding their beliefs about symptom presentation and treatment (Engel, 1977). This notion was highlighted by participant 3, who described the importance of clinicians thinking about the '*big picture*' when managing people with osteoarthritis. Furthermore, he argued that treatment must be multi-modal, include lifestyle change, and be tailored to the specific needs and interests of the person. The Biopsychosocial Model was first proposed by Engel (1977) as an extension of the Biomedical Model, to address limitations of the biomedical approach to patient care. As the name suggests, the model directs the clinician to consider the biomedical aspects of the person's condition, as well as their psychological, cultural and social qualities. Many authors have argued that clinicians treating people with osteoarthritis should be using the Biopsychosocial model to inform their practice (Brembo et al., 2016; Hunt, Birmingham, Skarakis-Doyle, & Vandervoort, 2008; Hunter, 2011; Nijs, Roussel, Paul van Wilgen, Köke, & Smeets, 2013).

### 9.4.2 Theme 2: *Anticipating what patients think*

Participants often made assumptions about the osteoarthritis-related beliefs their patients held. In many cases, participants felt their patients' beliefs were misplaced. Caution should be applied when interpreting one group's (clinicians) beliefs of another group's (patients) viewpoints, as research has shown considerable differences between the way the patient and the clinician view the same consultation (Hudak et al., 2002; Suarez-Almazor et al., 2010). However, this theme was retained because it provides insight into the clinician's perspective of patient-clinician interactions.

The key patient misconception that participants referred to was the cause of osteoarthritis. Specifically, that osteoarthritis was primarily caused by joint wear and tear. This belief was highlighted by participant 10, who commented that the '*biggest*' patient misconception about osteoarthritis being that all symptoms are attributed to joint wear and tear. This misconception is understandable because in the past osteoarthritis has commonly been described as a non-inflammatory disease resulting from joint wear and tear (Hunter et al., 2008). However, researchers argue that this view of osteoarthritis is strongly located in a biomechanical view of disease and thus needs to change because it does not reflect the complexity of the disease (Hunter, 2011; Hunter et al., 2008). The causes and pathology are more multifactorial than previously thought, as such treatment approaches need to reflect this (Hunter, 2011; Hunter & Lo, 2009; MacKay, Jaglal, Sale, Badley, & Davis, 2014; McAlindon, 2015; Wang et al., 2011).

### 9.4.3 Theme 3: *Enabling patients to understand their osteoarthritis and find their treatment path*

Irrespective of their profession, participants typically described two functions of their clinical role that were important to the effective treatment of patients with osteoarthritis; (i) patient education, and the (ii) navigation of patients through the healthcare system. Additionally, participants referred to the need for clinicians to work together using a collaborative interprofessional approach to aid the patient's journey through the healthcare system.



Patient education was viewed as an important part of osteoarthritis treatment. So much so, that one participant (participant 6, sport physician), said that effective patient education was the difference between whether a patient left their consultation with him better than when they arrived or not. Research shows that effective education can improve clinical outcomes and reduce health care costs for people with chronic conditions such as arthritis (Lorig, Mazonson, & Holman, 1993; Wagner et al., 2001). However, some participants indicated that patient education was not always optimal and that this may be linked to poor patient engagement in conservative treatment. Conservative treatment strategies require considerable investment in time and energy from both patient and clinician. Research has indicated that patient education is a crucial step in facilitating patient engagement in the treatment (Dobson et al., 2016; Egerton, Diamond, Buchbinder, Bennell, & Slade, 2016).

Participants indicated that assisting patients to navigate a suitable treatment path for their osteoarthritis was challenging. A potential reason for this challenge may be the complexity of treating chronic health conditions. People living with osteoarthritis are often required to self-manage their symptoms, negotiate complex medical or exercise programmes, and cope with the physical, the psychological and emotional impact of the condition (Hall et al., 2008; Woolf & Pfleger, 2003). Research indicates that the management of chronic health conditions is substantially more complex than managing acute episodes of illness (Wagner et al., 2001).

Some participants described needing to refer to other clinicians from different health professions when treating people with osteoarthritis. However, while they felt an integrated approach to care was in the patient's best interest, they believed achieving this was often challenging. Participants referred to barriers being poor communication processes between clinicians, other health professionals not having sufficient knowledge about the condition, and time limitations in the clinic. These findings are supported by similar research that found that engagement in conservative treatment for osteoarthritis was limited by surgeons' lack of knowledge about conservative treatment guidelines, poor communication between health professions, and beliefs about the limited treatment efficacy of conservative methods (Hofstede et al., 2016).

#### 9.4.4 Theme 4: *Understanding that treatment only works when everyone is engaged*

The majority of participants (clinicians) stated that they viewed exercise and education as essential components in the management of mild to moderate osteoarthritis. A finding that indicates that the participants' beliefs about conservative management were in keeping with current literature about best practice (Fransen & McConnell, 2008; Juhl, Christensen, Roos, Zhang, & Lund, 2014; Merashly & Uthman, 2012; Zhang et al., 2008). Furthermore, they discussed the merits of lifestyle changes and total joint replacement surgery, when used with the right person at the right time. Conversely, some participants had concerns about the inappropriate selection of people for joint replacement surgery, which can result in poor post-operative outcomes (Lungu, Desmeules, Dionne, Belzile, & Vendittoli, 2014). Participants also raised concerns about the poor application of conservative treatment by clinicians, and that this could fuel clinicians' beliefs about limited patient benefit or efficacy. While exercise is seen as a cornerstone of osteoarthritis treatment, previous research indicates that poor exercise prescription can result in limited treatment benefit, and unnecessary pain and disability (Fransen & McConnell, 2008).

An unexpected finding was that some clinicians believed osteoarthritis to be simple and potentially boring to treat. Participant 1 highlighted this point when she described her experience of working with clinicians who did not enjoy treating people with osteoarthritis as they felt their treatment was ineffective. Additionally, Participant 6 described how he previously '*dread[ed] these patients*', but his view changed once he learned more about conservative osteoarthritis treatment. While the reasons for these findings are not entirely understood, they potentially relate to negative beliefs about the efficacy or the complexity of conservative treatment. These beliefs may be especially apparent among younger clinicians or those with limited experience of managing osteoarthritis. Previous research shows that some clinicians view the conservative management of osteoarthritis as ineffectual, too challenging or complex for patients (Conrozier et al., 2008; Hofstede et al., 2016; Holden et al., 2009; Poitras et al., 2010).

The concerns about the effectiveness of conservative treatment may also relate to beliefs about the challenge of engaging people with osteoarthritis in rehabilitation. Participants

referred to the challenge of facilitating patient adherence to exercise and physical activity. These findings are supported by current literature indicating that long-term adherence to exercise programmes is poor in people with osteoarthritis and that facilitating sustainable, healthy behaviour change with these people is complex (Bennell et al., 2014; Pisters et al., 2010). To combat this challenge, researchers have argued that health professionals need to move from the paradigm of prescribing treatment and expecting the patient to do it, to one of facilitating adherence to treatment, especially regarding exercise therapy (Bennell et al., 2014). However, treatment adherence is complex, especially for treatments that require people to make significant lifestyle changes or adhere to an exercise regimen (Bassett, 2015; Pisters et al., 2010). Therefore, clinicians need to apply multiple techniques to facilitate engagement and ensure treatment adherence.

#### **9.4.5 Health and illness belief models and practice models related to study findings**

The findings of the present study indicate that participants' beliefs about osteoarthritis appear to be influenced by concepts from both the Biomedical and Biopsychosocial models (Engel 1977). However, the results show that clinician participants identified ideas that are not clearly represented in either of these two models. First, participants described the importance of engaging, supporting or navigating their patients through their treatment. As such, they placed their patients at the centre of their osteoarthritis treatment plan. Second, they specified their own need to collaborate with other healthcare professionals to ensure effective treatment of their patients with osteoarthritis. These findings suggest that some clinicians are cognisant of the clinical practice issues raised by Brand et al. (2013), who found that people with osteoarthritis felt that their health professionals demonstrate a limited understanding of their condition, poor interprofessional communication, and poor cohesion of clinical services. Therefore, it is appropriate that any questionnaire(s) used to explore clinicians' osteoarthritis beliefs are designed to investigate concepts that underpin the Biomedical and Biopsychosocial models of health. However, it is also important that questions that explore clinicians' beliefs about patient-centred care and interprofessional collaboration are included.

#### **9.4.6 Strengths and limitations of the study**

The study had two strengths. One, data were collected from participants from a range of health professions. Therefore, the beliefs identified were not limited to those of a single healthcare profession and may be considered more transferable to a wider range of health professionals. Two, the method of data collection allowed for rich data to be elicited on a phenomenon that has not previously been explored in this manner in New Zealand.

Therefore, the study was not a superficial evaluation of the issue but an in-depth exploration of the insights, expectations and beliefs of the participants.

The study had three limitations. One, the physiotherapists who chose to participate were all employed in private practice. It is possible that these participants hold beliefs about osteoarthritis that differ from physiotherapists working in different clinical environments. Two, attempts were made to include participants from a range of different professions. However, there are some professions not represented in the study, such as practice nurses, occupational therapists, and geriatricians. The inclusion of participants from these professions may have added greater insight into the phenomenon of osteoarthritis beliefs. Three, ethical limitations mean that data were only collected from people who volunteered for the study. These clinicians may hold beliefs regarding the management of osteoarthritis that differ from those who chose not to participate.

### **9.5 Summary and recommendations**

In summary, this study shows that clinicians hold a wide range of beliefs and expectations about the treatment of people with hip and/or knee osteoarthritis. The findings indicate that these participants conceptualised the pathology and treatment of osteoarthritis from a combination of both biomedical and biopsychosocial perspectives. Participants also valued the importance of patient engagement and collaborative practice between health professionals. The beliefs described in the present study are those of a small number of health care professions in New Zealand. Therefore, a quantitative survey-based study is needed to identify if these findings are reflective of the beliefs held by a larger population of health professionals in New Zealand. This future study should use a questionnaire(s) underpinned by the Biomedical and Biopsychosocial Models of health but should also

include measures that explore beliefs about collaborative practice between health professionals and patient engagement.

## **Chapter 10 Selection of the questionnaire for inclusion in the survey of clinicians' beliefs about hip and/or knee osteoarthritis**

This chapter describes the steps undertaken to select the questionnaire(s) included in the survey of clinicians' health, illness and treatment beliefs about hip and/or knee osteoarthritis. The structure of this chapter and the methods used for the systematic review are similar to those previously described in Chapter 7.

### **10.1 Research question**

The research question was:

Can the beliefs held by New Zealand clinicians about hip and/or knee osteoarthritis be measured with an existing health, illness and/or treatment beliefs questionnaire?

If more than one suitable questionnaire is identified, the most psychometrically robust and conceptually appropriate will be selected for inclusion in the survey.

### **10.2 Methods**

#### **10.2.1 Literature search**

A comprehensive computerised search was undertaken of electronic databases including CINAHL Plus, SocINDEX, MEDLINE, SPORTDiscus, PsychINFO, and SCOPUS via EBSCO host on the 17<sup>th</sup> May 2016. Search terms were selected in collaboration with an Auckland University of Technology librarian with extensive experience in searching the health literature and extracted from (i) key terms in the research question and (ii) the findings of the qualitative descriptive study of the clinicians' beliefs about the treatment of people living with hip and/or knee osteoarthritis (Chapter 9). The terms were purposefully kept broad so that the search could include suitable studies that may not have been identified with more restrictive search terms. The following terms were used: (measure\*

OR tool\* OR instrument\* OR scale\*) AND (valid\* OR reliab\*) AND (treatment\* N10 belief\* OR treatment\* N5 attitude\* OR manage\* N10 belief\* OR manage\* N5 attitude\*) AND (clinician\* OR physician\* OR doctor\* OR physiotherapist\* OR "physical therapist\*" OR "health professional\*" OR "healthcare professional\*" OR "care professional\*" OR "healthcare provider\*" OR "care provider\*" OR "general practitioner\*" OR GP OR GPs). The methods used for selecting the studies to be appraised and subjected to data extraction were the same as described in the previous systematic literature review (Section 7.2.1).

### **10.2.2 Inclusion criteria**

Studies were included if they focused on beliefs about chronic musculoskeletal conditions; included health professionals', clinicians' or physicians' beliefs; used a quantitative measure of health, illness or treatment beliefs that was described in English; explored the measurement properties of the included questionnaires; and had the full text available. Studies with participants with chronic musculoskeletal conditions other than osteoarthritis were included in the search because of the small body of literature on clinicians' osteoarthritis beliefs.

### **10.2.3 Exclusion criteria**

Studies were excluded if they were not published in a peer-reviewed journal; if despite being reported in English, no English version of the questionnaire or measure was available; or if the measure focused on depression or mental health disorders, obesity or decision-making strategies. Health, illness and treatment beliefs questionnaires described in the grey literature (i.e. research reports not subjected to peer review, working papers or government documents and unpublished theses) were not included as they may not have been subjected to suitable peer review.

### **10.2.4 Identification and evaluation of questionnaires**

First, the questionnaires contained in the studies identified in the literature search were subjected to a preliminary screen, to assess the extent to which their constructs were reflective of the key aspects of the research question (10.1). Questionnaires considered inappropriate were removed. Second, studies were scrutinised for methodological quality

and data were extracted, guided by the COSMIN checklist (Terwee et al., 2007). Third, questionnaires considered the most conceptually suitable and psychometrically robust were subjected to a comparison by the doctoral candidate, with the themes and notions from the qualitative study (Chapter 9).

#### **10.2.5 COSMIN checklist of methodological quality and extraction of generalizability data**

The appraisal of methodological quality and generalizability data extraction were guided by the COSMIN checklist (Terwee et al., 2007, 2012). This systematic review used the COSMIN checklist with the same method as described in Chapter 7.

#### **10.2.6 Comparison of questionnaire constructs to the themes identified in the qualitative study**

Following appraisal with the COSMIN checklist, the questionnaires considered the most psychometrically robust and conceptually suitable were retained for a second comparison with the themes and notions from the qualitative study of clinicians' beliefs (Chapter 9). Questionnaires were considered psychometrically robust if the related study received two or more *excellent* ratings on the COSMIN checklist. If the key constructs of the questionnaire related to the measurement of clinicians' health, illness and treatment beliefs, it was considered conceptually suitable.

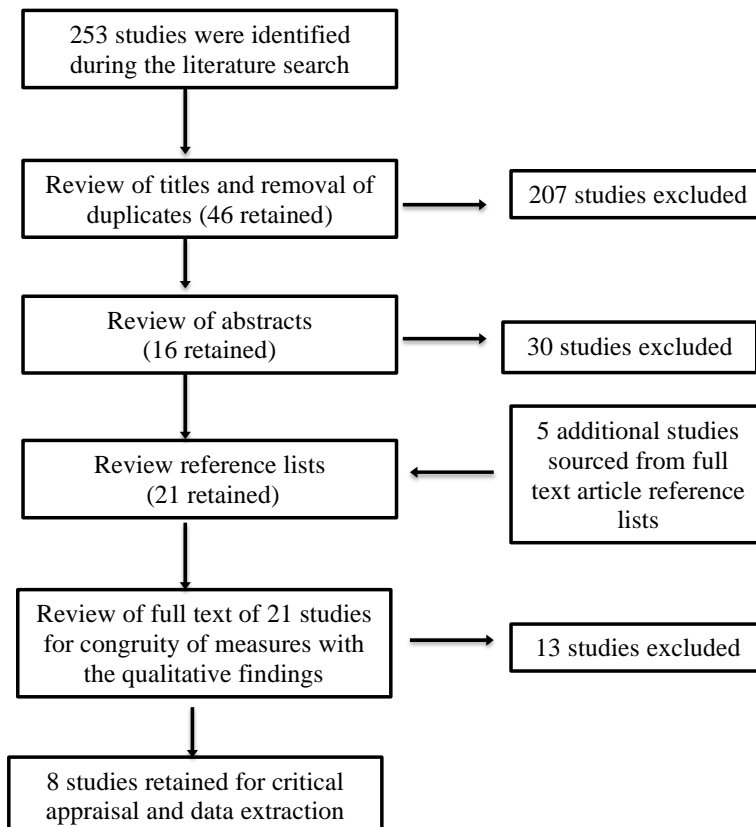
The following steps were completed to identify the extent to which constructs of the retained questionnaires overlapped with the themes and notions identified in the qualitative descriptive study (Chapter 9). First, the key constructs were extracted from the retained questionnaires. Second, these constructs were mapped against the themes and notions of the qualitative study. Third, any overlap between constructs, and the themes and notions identified in Chapter 9, were examined.



## 10.3 Results

### 10.3.1 Study selection and questionnaire identification

The process of selecting studies is summarised in *Figure 9*. The literature search identified a total of 253 studies. Two hundred and seven studies were removed following the review of study titles as they did not contain the key concepts of the study question or were duplicates. The abstracts of the remaining 46 studies were reviewed, resulting in the removal of a further 30 studies that did not meet the inclusion criteria. The reference lists of the remaining 16 studies were screened for additional suitable studies. This process identified another five studies that met the inclusion criteria. Consequently, 21 studies were retained for comparison with the themes and notions from the qualitative study of clinicians' beliefs (Chapter 9). These studies contained eleven different questionnaires (Table 22).



**Figure 9.** The selection process of studies including measures of clinicians' health, illness and/or treatment beliefs for review.

**Table 22.**

*Potential Survey Questionnaires Identified by the Systematic Review*

Questionnaire	Author
Attitudes to Back Pain Scale in Musculoskeletal Practitioners	Pincus et al. (2006)
Attitudes to Back Pain Scale in Musculoskeletal Practitioners	Pincus et al. (2007)
Clinician Support for Patient Activation Measure	Hibbard et al. (2010)
Clinician Support for Patient Activation Measure	Rademakers et al. (2015)
Fear Avoidance Beliefs Questionnaire	Couderye et al. (2006)
Fear Avoidance Beliefs Questionnaire	Couderye et al. (2007)
Health Care Providers Pain and Impairment Relationship Scale	Houben et al. (2004)
Pain and Attitudes Beliefs Scale	Bowey-Morris et al. (2010)
Pain and Attitudes Beliefs Scale	Bishop et al. (2008)
Pain and Attitudes Beliefs Scale	Houben et al. (2005)
Pain and Attitudes Beliefs Scale (neck pain)	Mutsaers et al. (2014)
Pain and Attitudes Beliefs Scale	Ostelo et al. (2003)
Pain and Attitudes Beliefs Scale	Sit et al. (2015)
Pain and Attitudes Beliefs Scale	Vonk et al. (2009)
Researcher generated (20 item) questionnaire	Ponte et al. (2005)
Researcher generated (57 item) questionnaire	Rognstad et al. (2012)
Researcher generated questionnaire with vignette (exercise beliefs with knee OA)	Holden et al. (2008)
Researcher generated questionnaire with vignette (exercise beliefs with knee OA)	Holden et al. (2009)
Researcher generated questionnaire on GP practice habits with people with OA	Kingsbury et al. (2012)
Researcher generated questionnaire on GP, physician assistants and nurse practitioners' practice habits with people with OA	Glauser et al. (2011)
Tool for Evaluating the ways Nurses Assess Pain	Ng et al. (2014)

Note: Questionnaires are listed in alphabetical order.

The 11 questionnaires (described in 21 studies) were examined to identify the extent to which they contained items or questions that could measure the themes and notions found in the qualitative descriptive study of clinicians' beliefs (Table 23).

**Table 23.**

*Themes and Associated Notions from the Qualitative Descriptive Study of Clinicians' Beliefs about the Treatment of their Patients with Osteoarthritis*

Themes	Notions
Theme 1: Matching each patient's signs and symptoms	X-rays do not equal dysfunction The old versus the young osteoarthritis patient
Theme 2: Anticipating what patients think	Misplaced beliefs Reactions and coping
Theme 3: Enabling patients to understand their osteoarthritis and find their treatment path	My role The role of others
Theme 4: Understanding that treatment only works when everyone is engaged	Efficacy Osteoarthritis is unexciting to treat Engagement

Based on this appraisal, 13 studies were excluded because their questionnaires were unsuitable for the purposes of this review (*Figure 8*). Seven of these excluded studies used questionnaires that focused on constructs that did not relate to the themes identified in the qualitative study of clinicians' beliefs (Chapter 9). They focused on postoperative pain management (Rognstad et al., 2012), pain medication prescription (Ng, Brammer, Creedy, & Klainin-Yobas, 2014; Ponte & Johnson-Tribino, 2005), and treatment behaviours not health and illness beliefs (Glauser et al., 2011; Holden et al., 2008, 2009; Kingsbury & Conaghan, 2012). The other six studies were excluded because either they did not include an outline of the development of the questionnaires (Coudeyre et al., 2007; Houben et al., 2005; Rademakers, Jansen, van der Hoek, & Heijmans, 2015; Sit, Yip, Chan, & Wong, 2015; Vonk, Pool, Ostelo, & Verhagen, 2009), or because the authors were reporting a different aspect of data that was already included in an identified study (Pincus et al., 2007). Therefore, five questionnaires described in eight studies were retained for appraisal of methodological quality and data extraction (Table 24).

**Table 24.***Potential Survey Questionnaires Identified*

Questionnaire	Author
ABS-mp	Pincus et al. (2006)
CS-PAM	Hibbard et al. (2010)
FABQ	Coudeyre et al. (2006)
HC-PAIRS	Houben et al. (2005)
PABS-PT	Bishop et al. (2008); Bowey-Morris et al. (2010); Mutsaers et al. (2014); Ostelo et al. (2003)

Note: ABS-mp = attitudes to back pain in musculoskeletal practitioners, CS-PAM = Clinician Support for Patient Activation Measure, FABQ = Fear Avoidance Beliefs Questionnaire, HC-PAIRS = Health Care Providers Pain and Impairment Relationship Scale, PABS-PT = Pain and Attitudes Beliefs Scale.

**10.3.1.1 COSMIN critique of methodological quality**

Table 25 shows the COSMIN checklist ratings for each of the included studies. Ratings ranged from *poor* through to *excellent* and were only allocated when the aspect of measurement was assessed in the study. If the aspect of measurement was not included in the study, it received a ‘not tested’ (N/T) rating. No study explored all of the relevant categories described in the COSMIN checklist. However, the PABS-PT was appraised in four separate studies and the questionnaire was assessed on five of the categories of the checklist across these four studies (Bishop et al., 2008; Bowey-Morris, Purcell-Jones, & Watson, 2010; Mutsaers et al., 2014; Ostelo, Stomp-van den Berg, Vlaeyen, Wolters, & de Vet, 2003b).

Internal consistency was assessed in five studies, and ratings ranged from *poor* (Hibbard et al., 2010; Pincus et al., 2006), to *excellent* (Houben et al., 2004; Ostelo et al., 2003b).

Reliability was tested in two identified studies, one rated as *poor* (Bowey-Morris et al., 2010) and the other *fair* (Mutsaers et al., 2014). Measurement error was rated for two of the identified studies; both were rated as *fair* (Bowey-Morris et al., 2010; Mutsaers et al., 2014). Content validity was identified in two studies and rated as *fair* (Bishop et al., 2008) and *excellent* (Pincus et al., 2006). The structural validity of four studies was evaluated, and ratings ranged from *fair* (Mutsaers et al., 2014) to *excellent* (Houben et al., 2004; Ostelo et al., 2003b; Pincus et al., 2006).

**Table 25.***Summary of the COSMIN Checklist Rating of Methodological Quality*

Questionnaire	Author	Internal consistency	Reliability	Measurement error	Content validity	Structural validity
ABS-mp	Pincus et al. (2006)	Poor	N/T	N/T	Excellent	Excellent
CS-PAM	Hibbard et al. (2010)	Poor	N/T	N/T	N/T	N/T
FABQ	Coudeyre et al. (2006)	N/T	N/T	N/T	N/T	N/T
HC-PAIRS	Houben et al. (2004)	Excellent	N/T	N/T	N/T	Excellent
PABS - PT	Bishop et al. (2008)	N/T	N/T	N/T	Fair	N/T
PABS - PT	Bowey-Morris et al. (2010)	N/T	Poor	Fair	N/T	N/T
PABS - PT	Ostelo et al. (2003)	Excellent	N/T	N/T	N/T	Excellent
PABS - PT (neck pain)	Mutsaers et al. (2014)	Fair	Fair	Fair	N/T	Fair

Note: ABS-mp = Attitudes to Back Pain in musculoskeletal practitioners, CS-PAM = Clinician Support for Patient Activation Measure, FABQ = Fears and Beliefs Questionnaire, HC-PAIRS = Health Care Providers Pain and Impairment Relationship Scale, PABS-PT = Pain Attitudes and Beliefs Scale for Physiotherapists, N/T = Not Tested

### **10.3.1.2 Extracted data**

Table 26 presents the results of the data extraction process. The results show that the questionnaires were designed and developed for a variety of purposes. Additionally, the questionnaires assessed different facets of clinicians' beliefs, ranging from those about the condition or pathology itself to the clinicians' beliefs about their patients' pain and impairment levels. Most of the studies focused on exploring clinicians' beliefs about people with lower back pain. The study by Mutsaers et al. (2014) was the only study to focus on beliefs about a different condition and investigated clinicians' beliefs about neck pain. Six of the studies referenced a theory that underpinned the development of the questionnaire. However, none of the studies explicitly specified how the theory or model informed the development of the questionnaire.

Demographic and occupational characteristics data were extracted from the identified studies (Table 26). Study participants came from a range of different health professions including chiropractic, general practice, manual therapy, nurse practitioners, osteopathy, physiotherapy, and primary care physicians. Study sample sizes ranged from 83 (Bowey-Morris et al., 2010) to 1022 participants (Bishop et al., 2008). Seven studies reported participant gender, the percentage of female participants varied from 20% (Coudeyre et al., 2006) to 81% (Bishop et al., 2008). Professional experience was represented as years of practice, and the duration differed amongst studies. Additionally, the presentation of this data differed amongst studies, with some authors choosing to present a group mean, whereas others provided a categorical description. One identified study collected data on the postgraduate or ongoing training undertaken by the participants (Bishop et al., 2008). Participants were recruited from a range of different settings including primary, secondary and tertiary care settings, professional membership lists, employment location, or a postgraduate education program. The studies were situated in a number of different countries including the United Kingdom, United States of America, France and the Netherlands. The questionnaires were originally written in English, French and Dutch (Table 26). Survey response rates differed considerably between studies, ranging from 22% (Bishop et al., 2008) to 89% (Bowey-Morris et al., 2010).

**Table 26.***Data Extracted in Keeping with the COSMIN Checklist*

Measure	Authors	Purpose of measure	Theory	Professions (Sample size)	Gender	Years of practice (mean)	Post grad training	Setting	Location, language of measure	Recruitment method	Response rate
ABS-mp	Pincus et al. (2006)	Assesses practitioner attitudes and beliefs about the LBP treatment	Unclear	Physio, chiro, and osteo (541)	N/R	Physio 16.3 chiro 9.0 osteo 19.4	N/R	Unclear	UK, English	Random selection from professional membership lists	61%
CS-PAM	Hibbard et al. (2010)	Assesses clinician beliefs about patient self-management	Unclear	Physicians, physician assistants, nurse practitioners (175)	46% female	0-5 10%, 6-10 18%, 11-15 34%, 16-20 24%, 21+ 14%.	N/R	Primary care	UK and USA, English	Regional primary care clinics	USA 81%, UK 35%
FABQ	Coudeyre et al. (2006)	Assesses GPs LBP fear avoidance beliefs	TAMPA scale	GPs (864)	20% female	<10 13%, 10-20 42%, 21-30 40%, >30 5%.	N/R	Primary care	France, French	Random selection from professional membership lists	48%
HC-PAIRS	Houben et al. (2004)	Explores clinicians' beliefs about relationship between pain and impairment	Biomed and BPS	Physio, manual-therapy, chiropractors (156)	44.5% female	13.9	N/R	N/R	Holland, Dutch	Therapists participating in an education programme	N/R

Measure	Authors	Purpose of measure	Theory	Professions (Sample size)	Gender	Years of practice (mean)	Post grad training	Setting	Location, language of measure	Recruitment method	Response rate
PABS - PT	Bishop et al. (2008)	Explores clinicians' LBP beliefs and attitudes	Biomed and BPS	GPs (443) and physio (580)	GPs 41.5%, physio 80.8% female	GPs 18.7, physio 15.2	GPs 22.5%, physio 69.8%	Primary and secondary care	UK, English	Random selection from professional membership lists	GPs 22%, physio 55%
PABS – PT	Bowey-Morris et al. (2010)	Explores clinicians' LBP beliefs and attitudes	Biomed and BPS	GPs (84)	27% female	17.4	N/R	Primary care	Jersey, UK, English	All registered GPs practicing on the island	89%
PABS – PT	Mutsaers et al. (2014)	Explores clinicians' neck pain beliefs and attitudes	Biomed and BPS	Manual therapists (272)	22% female	19.3	Yes	Students	Holland, Dutch	Therapists participating in an on going education programme	53%
PABS – PT	Ostelo et al. (2003)	Explores clinicians' LBP beliefs and attitudes	Biomed and BPS	Physio (421)	37% female	17	Unclear	Primary and secondary care	Holland, Dutch	Random selection from professional membership lists and therapists participating in an on going education programme	62.3%

Note: Biomed = Biomedical, Physio = Physiotherapist, GP = General Practitioner, chiro = Chiropractor, osteo = Osteopath, ABS-mp = Attitudes to Back Pain in musculoskeletal practitioners, CS-PAM = Clinician Support for Patient Activation Measure, FABQ = Fears and Beliefs Questionnaire, HC-PAIRS = Health Care Providers Pain and Impairment Relationship Scale, PABS-PT = Pain Attitudes and Beliefs Scale for Physiotherapists, N/R = Not Reported, LBP = Low Back Pain.



### 10.3.2 Comparison of questionnaire constructs to the themes of the qualitative study

The PABS-PT (Ostelo et al., 2003b) was the only questionnaire retained for comparison with the themes and notions of the qualitative study (Table 27). The other four questionnaires were removed because they did not match the qualitative study's themes and notions. The key constructs of the PABS-PT cover four of the nine notions identified in the qualitative study of clinicians' beliefs.

**Table 27.**

*Comparison between Themes and Notions of the Qualitative Descriptive Study of Clinicians' Beliefs Study and the PABS-PT*

Themes	Notions	PABS-PT
Theme 1: Matching each patient's signs and symptoms	X-rays do not equal dysfunction	Yes
	The old versus the young osteoarthritis patient	No
Theme 2: Anticipating what their patients think	Misplaced beliefs	No
	Reactions and coping	No
Theme 3: Enabling patients to understand their osteoarthritis and find their treatment path	My role	Yes
	The role of others	Yes
Theme 4: Understanding that treatment only works when everyone is engaged	Efficacy (of treatment)	Yes
	Osteoarthritis is unexciting to treat	No
	Engagement	No

Note: PABS-PT = Pain Attitudes and Beliefs Scale for Physiotherapists.

## 10.4 Discussion

Five questionnaires were subjected to the rating of methodological quality and data extraction. The results indicate that the questionnaire development varied in methodological quality between the studies. The data extraction highlighted that none of the identified questionnaires specifically focused on clinicians' beliefs about osteoarthritis, most focused instead on LBP beliefs. The PABS-PT was assessed against the most COSMIN checklist categories (five). The PABS-PT showed the most promise for use in the survey. Therefore, the other four questionnaires were removed. The

reasons why the PABS-PT was selected and why each of the four other questionnaires was not retained are discussed below.

The Fear-Avoidance Beliefs Questionnaire (FABQ: Coudeyre et al., 2006) and CS-PAM (Hibbard et al., 2010) were not retained for two reasons. First, both questionnaires do not focus on clinicians' treatment, health or illness beliefs. The items of the FABQ focus on fear avoidance beliefs and the items of the CS-PAM focus on self-management beliefs. Second, the COSMIN checklist shows that both questionnaires have not yet been subjected to a thorough assessment of the development and construction. The FABQ was not subjected to any of the criteria rated by the COSMIN checklist. Only the internal consistency was rated for the CS-PAM, and the rating was *poor*.

The ABS-mp (Pincus et al., 2006) was not retained for two reasons. First, the items of the questionnaire are narrowly focused on beliefs about LBP, meaning that items could not easily be adapted to fit hip and/or knee osteoarthritis. Second, the questionnaire has not yet been subjected to estimates of reliability, and the internal consistency was rated as *poor*, indicating that its reliability is not established.

The HC-PAIRS (Houben et al., 2004) was not retained for two reasons. First, there is disagreement over the factor structure of the questionnaire. Initially, the measure had two reported factors, but Houben et al. (2004) identified only a single factor solution. A single-factor measure is not entirely congruent with the complexity of clinicians' beliefs recognised in the qualitative study (Chapter 9). Second, the study by Houben et al. (2004) was completed in the Netherlands and conducted in Dutch. The study is reported in English, but it is not clear if the translated items have been tested for cross-cultural validity. Therefore, it cannot be assumed that the questionnaire would retain its internal and structural validity when translated into English.

The PABS-PT was the most conceptually suitable and psychometrically robust questionnaire. This measure was included in the most appraised studies, it shows a consistent factor structure (two factors: biomedical and behavioural), and is informed by the Biomedical and Biopsychosocial Models. Collectively, the four studies that assessed the measurement capabilities of the PABS-PT covered five of the COSMIN categories, more than any of the other questionnaires (Bishop et al., 2008; Bowey-Morris et al., 2010; Mutsaers et al., 2014; Ostelo et al., 2003b). Additionally, the PABS-PT is the only questionnaire to have been used with a condition other than low back pain (neck pain: Mutsaers et al., 2014).

However, the measure has two limitations that merit discussion. First, the questionnaire does not reflect all the themes and notions identified in the qualitative descriptive study of clinicians' beliefs. Therefore, additional items are needed to address this. Second, the measure was designed for use with LBP, so the wording of a number of the items would need to be amended so that they are appropriate for the measurement of clinicians' beliefs about osteoarthritis.

This systematic review had two strengths. First, the search methods are presented so that the systematic review is structured and reproducible. Second, retained studies were critiqued using the COSMIN checklist, which is a reliable and valid tool for appraising questionnaire development (Terwee et al., 2012). This systematic review had two limitations. One, the selection of the inclusion criteria and databases may have inadvertently resulted in some studies not being found in the search due to publication or selection bias. For example, potential relevant studies not published in English. Two, all of the identified studies described questionnaires designed to measure beliefs about spinal pain. Therefore, the applicability of the questionnaires in the context of hip and knee osteoarthritis is unknown.

## **10.5 Conclusions and recommendations**

None of the five identified questionnaires were designed with the purpose of exploring clinicians' beliefs about the management of osteoarthritis. The PABS-PT was considered the most psychometrically robust questionnaire appraised in the systematic review and the most suitable to be adapted for the exploration of clinicians' osteoarthritis beliefs. However, the PABS-PT does not cover all of the themes and notions identified in the clinicians' qualitative study. Therefore, it is recommended that the survey is comprised of an adapted version of the PABS-PT, with some additional questionnaires to be included that measure the themes and notions not addressed by the PABS-PT.

## **Chapter 11 A cross-sectional survey of clinicians' beliefs about hip and knee joint osteoarthritis**

This chapter describes the methods and results of the cross-sectional survey of general practitioners' and physiotherapists' beliefs about hip and knee osteoarthritis. The structure of this chapter and the methods used are similar to those previously described in Chapter 8. In Chapter 10 it was explained that the PABS-PT was the most suitable questionnaire for use in the survey of clinicians' osteoarthritis beliefs. However, the constructs contained within the PABS-PT do not reflect all the themes and notions identified in the qualitative descriptive study of clinician's beliefs. Furthermore, none of the other measures appraised in the systematic literature review were suitable.

A further search of previously reviewed literature identified two additional measures that could address the gaps left by the PABS-PT; they were the Knee Osteoarthritis Fears and Beliefs Questionnaire (KOFBeQ: Benhamou et al., 2013) and a vignette-based questionnaire used in the study by Holden et al. (2008). Neither the KOFBeQ nor the vignette were appraised in the systematic literature review described in Chapter 10. The KOFBeQ was not included because it is designed for use with people living with knee osteoarthritis. However, the measure was appraised and selected for use in the survey of people with osteoarthritis (Chapter 7), and it was felt that the items could be adapted for use with clinicians.

Holden et al. (2008) used a clinical vignette to survey physiotherapists about their use of therapeutic exercise for patients with knee osteoarthritis. The study did not meet the inclusion criteria for the systematic review of clinicians' belief measures (Chapter 10) because it focuses on exercise prescription behaviours, not beliefs. However, the study includes a clinical vignette that describes a 'typical' primary care patient with knee joint osteoarthritis (Holden et al., 2008). The answers to these questions would give an insight into some of the clinicians' osteoarthritis treatment beliefs, such as beliefs about their perceived role and treatment efficacy.

Clinicians from a range of professional backgrounds were recruited to the qualitative study of clinicians' osteoarthritis beliefs. This recruitment facilitated rich data collection. However, only general practitioners and physiotherapists were recruited for the quantitative survey of clinicians' beliefs. Two considerations led to this decision.

First, general practitioners and physiotherapists are the two largest groups of healthcare professionals involved in the conservative management of osteoarthritis in New Zealand. Second, the relatively small number of surgeons, rheumatologists and sports physicians in New Zealand would have made recruiting samples large enough to enable meaningful statistical analysis prohibitive.

## **11.1 Research question**

The research question was:

Are the adapted PABS-PT and the adapted Clinicians' KOBeQ questionnaires reliable (internally consistent) and valid measures for clinicians in the New Zealand context?

## **11.2 Methods**

### **11.2.1 Study design**

The study was a cross-sectional observational design and data were collected by questionnaires administered online.

### **11.2.2 Participants and sample size**

Clinicians were eligible to take part if they were registered and practicing in New Zealand as either a physiotherapist or general practitioner (GP), had treated a patient with hip and/or knee osteoarthritis in the past six months, were living in New Zealand at the time of data collection, and had sufficient English language skills to complete the survey. The sample size was based on the recommendations of Pallant (2010), who stated that data sets with greater than 200 participants are sufficient for principal component analysis.

### **11.2.3 Measures**

The survey consisted of open- and closed-ended questions and was divided into three sections: (i) demographic and occupational characteristics, (ii) beliefs about the treatment of hip and/or knee joint osteoarthritis (PABS-PT: Ostelo, Stomp-van den Berg, Vlaeyen, Wolters, & de Vet, 2003; KOBeQ: Benhamou et al. 2013), and (iii) a clinical vignette (Holden et al., 2008)(Appendix O).

### 11.2.3.1 Section 1: Demographic and occupational characteristics

The first section of the questionnaire comprised of two parts. Part one collected demographic data about the participant such as occupation and gender. Part two collected data about occupational characteristics, such as duration of practice and geographical location of practice. Additionally, the occupational characteristics included questions about osteoarthritis-specific practice such as, *‘In your current job, how many patients do you see in your clinic/department with hip or knee osteoarthritis?’* and *‘What are the criteria that you typically used to decide that a person has osteoarthritis of the hip and/or knee joint?’*

### 11.2.3.2 Section 2: Health, illness and treatment beliefs

The osteoarthritis health, illness and treatment beliefs were measured by an adapted version of the PABS-PT and an adapted version of the KOFBeQ.

*Adapted PABS-PT:* The PABS-PT was originally designed to collect physiotherapists’ beliefs about the treatment of lower back pain (Ostelo et al., 2003a). Since then, the measure has been adapted for use with both GPs and physiotherapists (Bishop, Foster, Thomas, & Hay, 2008), and adapted to measure beliefs about neck pain (Mutsaers, Peters, Pool-Goudzwaard, Koes, & Verhagen, 2012). The present study used the original version of the questionnaire which consists of 20 items that are scored on a six-point Likert scale (*totally disagree to totally agree*: Ostelo et al., 2003). The questionnaire has a two-factor structure, one factor is named *Biomedical* (14 items) and the other *Behavioural* (6 items). The internal consistency (Cronbach’s alpha) of the *Biomedical* scale is acceptable and ranges from .75 to .84 (Mutsaers et al., 2012; Ostelo et al., 2003a). The internal consistency of the *Behavioural* scale is more inconsistent than the Biomedical scale, ranging from .54 to .73 (Mutsaers et al., 2012; Ostelo et al., 2003a). For use in the survey, the questionnaire was adapted so that any reference to low back pain (LBP) was replaced with *‘osteoarthritis’*.

*Adapted Clinicians’ KOFBeQ:* The KOFBeQ was originally designed to collect data from people with knee joint osteoarthritis (Benhamou et al., 2013). The adaptation of the questionnaire for use with people with hip osteoarthritis was previously described in Chapter 8, as was the reported factor structure, internal consistency and scoring method. The questionnaire was adapted for clinicians by changing some items so they included the following preface, *‘These are statements that patients have expressed about their knee or hip osteoarthritis. For each statement, evaluate to what extent you agree or*

*disagree with the statement*'. Additionally, items that began with *'My osteoarthritis...'* were changed to read *'My patients' osteoarthritis...'*. Questions that originally referred to GPs were split so that there would be an item for GPs and physiotherapists. For example, *'GPs underestimate pain in knee and hip osteoarthritis'* was converted into two separate items and became *'GPs underestimate pain in knee and hip osteoarthritis'* and *'physiotherapists underestimate pain in knee and hip osteoarthritis'*. Four items were added to the adapted Clinicians' KOFBeQ that reflected findings from the qualitative study of clinicians' beliefs. These items were: (i) *Most of my patients with hip and/or knee osteoarthritis hold inappropriate beliefs about the cause of their condition*; (ii) *Most of my patients with hip and/or knee osteoarthritis hold inappropriate beliefs about the prognosis of their condition*; (iii) *Most of my patients with hip and/or knee osteoarthritis hold inappropriate beliefs about the treatment of their condition*; (iv) *The clinical diagnosis of hip and/or knee osteoarthritis can be hard to make*. These additional items led to the adapted clinicians' version of the KOFBeQ consisting of 34 items.

#### **11.2.3.3 Section 3: Clinical vignette**

The vignette describes a typical person presenting in a primary care setting, for treatment of their knee osteoarthritis, as well as a series of practice-based questions (Appendix O). The questions related to how they would manage the person. The clinical vignette and questions were based on those used by Holden et al. (2008), but were altered for use with both physiotherapists and GPs. Holden et al. (2008) ensured the face validity of the vignette through piloting with an expert group.

#### **11.2.4 Procedure**

Before being administered, all the questionnaires contained in the survey were tested for face validity and utility. Three researchers, with experience in osteoarthritis research and survey design, read the questionnaires and the vignette, and provided feedback about survey length, appropriateness for the New Zealand context and readability. This feedback led to minor amendments of the wording of the survey. The study was granted ethical consent by the institutional ethics committee on the 11th August 2016 (AUTEC: 16/284: Appendix P).

The survey was advertised through physiotherapy continuing education courses; the Physiotherapy New Zealand Conference; online via the Physiotherapy New Zealand

and The Royal New Zealand College of General Practitioners e-newsletters; and via the local Primary Healthcare Organisation (Appendix Q). Data were collected between 1st September and 1st December 2016 via SurveyMonkey.com. Participants read the participant information form (embedded into the survey: Appendix O) and responded to the items in each questionnaire. On completion of the survey, participants submitted their answers and were given the option of entering a prize draw as an acknowledgement of their participation. Those participants who chose to enter the prize draw were directed to a separate web page that allowed collection of their email address for the draw. Participants could not be identified or traced because the responses were fully anonymised. Submission of the survey questionnaire was considered as consent to use the data for the purpose of this study.

#### **11.2.5 Data preparation**

The data were downloaded as a Statistical Package for Social Science (SPSS: IBM, USA) file from SurveyMonkey.com. Question codes were generated for all data. The correctness of all data was checked using descriptive statistics. The categorical data were checked using frequency and range scores, and continuous data were checked using the range, mean and standard deviation. Identified errors were corrected. Continuous data were assessed for normal distribution. This assessment included exploration of the skewness and kurtosis statistics, as well as plotting and reviewing histograms and stem and leaf plots. The data from questions that required people to tick all answers that applied to them (multiple answers) were converted to a dichotomous reporting format. For example, '*Which professions do you typically refer patients with osteoarthritis to? Dietician...*' became '*Do you usually refer people with osteoarthritis to a dietician*' (Yes/No). Free text fields, such as duration of clinical practice, were converted to a numerical format for analysis (i.e. five years was converted to 5). Where frequency data had very few counts (i.e. one person), categories were collapsed and included as an 'Other' category.

#### **11.2.6 Data analysis**

All data from the study were analysed using SPSS version 24.0 (IBM, USA), with the alpha level set at  $p < .05$ . Missing data was limited by the use of the online platform because participants were directed by prompts in the programme (SurveyMonkey.com) to complete any missed item or question. Only complete data sets for each questionnaire



(i.e. the adapted PABS-PT) were analysed. It was not possible to calculate a total return rate for the survey as participants completed the study online and it is not known how many people saw the study advertisement but chose not to participate.

#### ***11.2.6.1 Section 1: Clinicians' demographic and occupational characteristics***

All data describing demographic and occupational characteristics were categorical. The total number of scores for each category were converted to a percentage score of the total number of people who answered the question. Data from GPs and physiotherapists were presented together and separately, to allow comparison between the two professions. Where categories represented a small number of participants, they were collapsed into a single category called Other. Group equivalency between the two professions for demographic and occupational characteristics data were assessed by Chi-Square tests (Pallant, 2010). Where data represented a two-by-two assessment, the Yates Continuity Correction was reported (Pallant, 2010).

#### ***11.2.6.2 Section 2: Clinicians' health, illness and treatment beliefs***

*Adapted PABS-PT:* First, the mean and standard deviation for scores were calculated to indicate the response distribution for data from all items in the PABS-PT. Second, to determine if the sample was suitable for principal component analysis (PCA), the correlation matrix was calculated and screened to ensure the presence of correlations of .3 or greater, and the data were subjected to the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of Sphericity. Third, the data were subjected to principal component extraction. In keeping with findings of Ostelo et al. (2003a), the criteria were limited to a two factor solution and the Eigenvalues for each factor were plotted. Fourth, because it was expected that items would not be completely independent of each other, the data were subjected to a varimax rotation. For clarity, factor loadings of .45 or less were concealed. Fifth, each subscale (factor) was named, and its internal consistency examined by calculation of the Cronbach's alpha. Where appropriate, the names of subscales matched those proposed by Ostelo et al. (2003). The scale or subscale was described as having acceptable internal consistency where the items concerned made conceptual sense and had a Cronbach's alpha equal or greater than .7. Sixth, the group mean scores and standard deviations were calculated for each of the subscales.

*Adapted Clinician's KOFBeQ*: First, the mean and standard deviation were calculated to indicate the response distribution for data from all items in the adapted Clinicians' KOFBeQ. Second, to determine if the sample was suitable for PCA, the correlation matrix was calculated and screened to ensure the presence of correlations of .3 or greater, and the data were subjected to the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of Sphericity. Third, the data were subjected to principal component extraction. As items had been added to the scale, a scree plot was charted with the Eigenvalues for each factor were plotted. Factors to the left of the elbow of the scree plot were retained for rotation. Fourth, because it was expected that items would not be completely independent of each other, the data were subjected to a varimax rotation. For clarity, factor loadings of .45 or less were concealed. Fifth, each factor (subscale) was named and the internal consistency was estimated by Cronbach's alpha. Where appropriate, the names used match those originally used by Benhamou et al. (2013). The scale or subscale was described as having acceptable internal consistency where the relevant items made conceptual sense and had a Cronbach's alpha equal or greater than .7. Sixth, the group mean scores and standard deviations were calculated for each of the subscales.

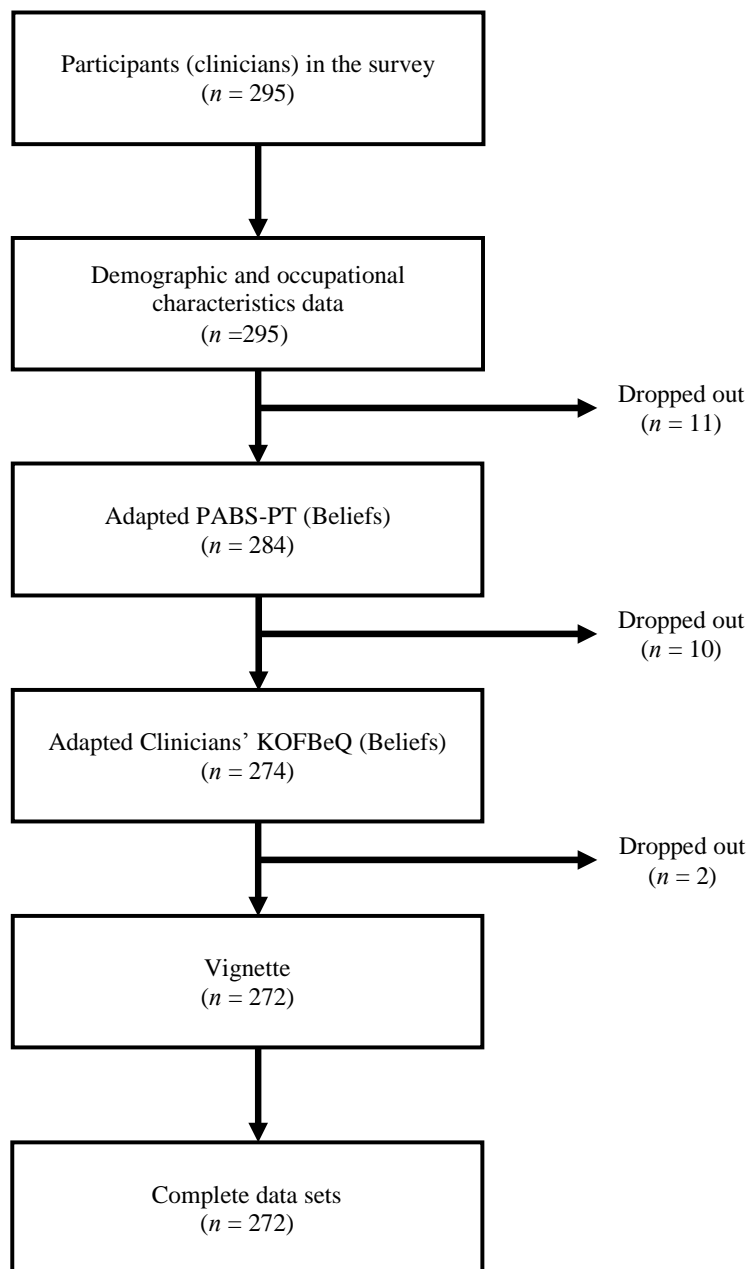
#### **11.2.6.3 Section 3: Clinical vignette**

All data were categorical, so the total number of scores for each category were counted and converted to a percentage score of the total number of people who answered the question. Data from GPs and physiotherapists were presented as a single group and separately to allow comparison between the two professions. Group equivalence of the vignette question data between the two professions was assessed by Chi-Square tests (Pallant, 2010). Where data represented a two-by-two test, the Yates' Continuity Correction was reported (Pallant, 2010).

## 11.3 Results

### 11.3.1 Participants

A total of 295 clinicians (87 GPs and 208 physiotherapists) participated in the study. A summary of the survey sections completed and dropouts from each section are shown in *Figure 10* below.



**Figure 10.** Overview of survey data collection, clinicians' beliefs about hip and/or knee osteoarthritis. Note: KOFBeQ = Knee Osteoarthritis Fears and Beliefs Questionnaire, PABS-PT = Pain Attitudes and Beliefs Scale for Physiotherapists.

### 11.3.2 Section 1: Clinicians' demographic and occupational characteristics

Two hundred and ninety-five participants completed the demographic and occupational characteristics section of the survey. Table 28 shows a summary of their demographic and occupational characteristics, with the results being presented for the entire sample and for each profession (GPs and physiotherapists).

Approximately 70% of participants were physiotherapists. More females than males completed the survey, irrespective of their profession. The duration of practice ranged from less than 5 years to greater than 20 years in both groups. However, a significantly higher percentage of GPs than physiotherapists had greater than 20 years in practice, and more physiotherapists had less than 5 years. A similar percentage of participants (clinicians) in each profession had hip and/or knee osteoarthritis. Significantly more of the physiotherapists than GPs had completed some form of postgraduate training, and had completed their pre-registration qualifications in New Zealand. Participants from both professions came from a range of geographical and employment settings. Significantly more GPs worked in private practice, whereas more physiotherapists worked in the public system.

GPs saw significantly more people with hip and/or knee osteoarthritis more frequently. Additionally, a significantly higher percentage of GPs indicated that they would frequently refer people with osteoarthritis to other health professionals, and indicated that they would typically refer a patient with osteoarthritis to Green Prescription, orthopaedic surgery, pain services and radiology. While *chiropractor* was included as a response option in the survey, no participants indicated that they would refer people with osteoarthritis to this profession.

**Table 28.***Participants' Demographic and Occupational Characteristics*

Characteristic	Total (%)	GP (%)	Physiotherapy (%)	Statistic (Chi-square test)	p-value
Participants	<i>n</i> =295	<i>n</i> = 87 (29.5)	<i>n</i> = 208 (70.5)		
Gender					
Male	111 (37.6)	39 (44.8)	72 (34.6)	$X^2$ (1) = 2.31	.129
Female	184 (62.4)	48 (55.2)	136 (65.4)		
Duration in practice					
Less than 5 years	60 (20.3)	9 (10.3)	51 (24.5)	$X^2$ (4) = 13.24	<b>.010</b>
Between 6 and 10 years	63 (21.4)	20 (23.0)	43 (20.7)		
Between 11 and 15 years	38 (12.9)	11 (12.6)	27 (13.0)		
Between 16 and 20 years	38 (12.9)	8 (9.2)	30 (14.4)		
Greater than 20 years	96 (32.5)	39 (44.8)	57 (27.4)		
Completed post graduate training					
Yes	102 (34.6)	8 (9.2)	93 (44.7)	$X^2$ (1) = 32.81	<b>.0001</b>
Location of pre-registration qualification					
In New Zealand	217 (73.6)	54 (62.1)	163 (78.4)	$X^2$ (1) = 7.56	<b>.006</b>
Elsewhere	78 (26.4)	33 (37.9)	45 (21.6)		
Location of clinical practice					
City	197 (66.8)	54 (62.1)	143 (68.8)	$X^2$ (2) = 5.03	.081
Town	63 (21.4)	17 (19.5)	46 (22.1)		
Rural	35 (11.9)	16 (18.4)	19 (9.1)		
Employment setting					
Public (i.e. DHB or hospital)	51 (17.3)	4 (4.6)	47 (22.6)	$X^2$ (3) = 14.40	<b>.002</b>
Private (i.e. Private practice)	218 (73.9)	74 (85.1)	144 (69.2)		
Both	15 (5.1)	6 (6.9)	9 (4.3)		
Other*	11 (3.7)	3 (3.4)	8 (3.8)		

Characteristic	Total (%)	GP (%)	Physiotherapy (%)	Statistic	<i>p</i> -value
Frequency of treating patients with hip and/or knee osteoarthritis					
1 or more patients per day	81 (27.5)	35 (40.2)	46 (22.1)	$X^2 (3) = 27.67$	<b>.0001</b>
1 to 3 patients per week	121 (41.0)	43 (49.4)	78 (37.5)		
1 to 3 patients per month	66 (22.4)	8 (9.2)	58 (27.9)		
1 to 3 patients in the past six months	37 (12.5)	1 (1.1)	26 (12.5)		
Do you have hip and or knee osteoarthritis?					
Yes	51 (17.3)	13 (14.9)	38 (18.3)	$X^2 (1) = .19$	.659
Do you usually refer patients with osteoarthritis to other health professionals?					
Yes	128 (43.4)	86 (98.9)	42 (20.2)	$X^2 (1) = 16.39$	<b>.0001</b>
Do you usually refer patients with osteoarthritis to?					
Dietician	57 (19.3)	18 (20.7)	39 (18.8)	$X^2 (1) = .05$	.823
General practitioner	N/A	N/A	93 (44.7)		
Green prescription	120 (40.7)	49 (56.3)	71 (34.1)	$X^2 (1) = 11.61$	<b>.001</b>
Occupational therapist	44 (14.9)	14 (16.1)	30 (14.4)	$X^2 (1) = .04$	.851
Orthopaedic surgeon	190 (64.4)	76 (87.4)	114 (54.8)	$X^2 (1) = 26.95$	<b>.000</b>
Orthotist	37 (12.5)	8 (9.2)	29 (13.9)	$X^2 (1) = .87$	.352
Pain service	28 (9.5)	14 (16.1)	14 (6.7)	$X^2 (1) = 5.22$	<b>.022</b>
Personal trainer	39 (13.2)	4 (4.6)	35 (16.8)	$X^2 (1) = 6.97$	<b>.008</b>
Physiotherapist	N/A	64 (73.6)	N/A		
Psychologist	15 (5.1)	3 (3.4)	12 (5.8)	$X^2 (1) = .29$	.591
Radiographer / sonographer	130 (44.1)	61 (70.1)	69 (33.2)	$X^2 (1) = 32.48$	<b>.0001</b>
Other **	31 (10.5)	5 (5.7)	26 (12.5)	$X^2 (1) = 2.30$	.129

Note: DHB = District Health Board, GP = General Practitioner, N/A = Not Applicable. \*Other employment settings were: aged care ( $n = 1$ ), community care service ( $n = 2$ ), hospice care ( $n = 1$ ), Maori health trust ( $n = 2$ ), occupational health service ( $n = 1$ ), primary health organisations (PHO:  $n = 2$ ), and university clinic ( $n = 2$ ).

\*\*Other practitioners participants indicated that they would refer to included: arthritis nurse educator ( $n = 1$ ), community exercise programme ( $n = 7$ ), hydrotherapy ( $n = 2$ ), osteopath ( $n = 2$ ), personal trainer ( $n = 4$ ), podiatry ( $n = 7$ ), practice nurse ( $n = 6$ ), and sports doctor ( $n = 2$ ).

### 11.3.3 Section 2: Clinicians' health, illness and treatment beliefs

#### *11.3.3.1 The adapted Pain Attitudes and Beliefs Scale for Physiotherapists*

Two hundred and eighty-four complete individual participant data sets were analysed. Table 29 shows the individual item group mean and the standard deviation scores. The mean score of most of the items of the section was located between 2 and 5. The correlation matrix indicated that the data were suitable for principal component analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was .836, above the recommended value of .6, and Bartlett's Test of Sphericity was significant ( $\chi^2(190) = 1173.26, p < .0001$ ). Principal component analysis supported the previously identified two-factor solution (Ostelo et al., 2003a), the rotated factors explained 32.29% of the total variance. The item loading on the first component and the rotated individual item loadings are shown in Table 29. Two items did not load onto either factor with a value of .45 or greater. The Cronbach's alpha for the entire scale was acceptable (.75). The subscale mean scores, Cronbach alpha scores, Eigenvalues and percentage variance explained are shown in Table 30.



**Table 29.**

*Group Mean Items and Standard Deviation Scores, and Rotated Two Factor Analysis of the Adapted Clinicians PABS-PT*

PABS-PT item	Mean (SD)	Item loading	Factor**	
			1	2
If patients complain of pain during exercise, I worry that damage is being caused.	2.42 (1.05)	.65	<b>.65</b>	
If therapy does not result in a reduction in pain caused by osteoarthritis, there is a high risk of severe restrictions in the long term.	3.40 (1.22)	.58	<b>.64</b>	
Patients with pain caused by osteoarthritis should preferably practice only pain-free movements.	2.45 (1.07)	.60	<b>.62</b>	
Pain is a nociceptive stimulus, indicating tissue damage.	2.65 (1.15)	.63	<b>.60</b>	
The best advice for pain caused by osteoarthritis is: 'Take care' and 'Make no unnecessary movements'.	1.53 (0.77)	.59	<b>.59</b>	
Patients who have suffered osteoarthritic pain should avoid activities that stress the joint.	2.88 (1.22)	.60	<b>.59</b>	
Pain reduction is a precondition for the restoration of normal functioning.	3.70 (1.22)	.59	<b>.58</b>	
The severity of tissue damage determines the level of pain.	2.14 (1.08)	.59	<b>.52</b>	
Not enough effort is made to find the underlying organic causes of pain caused by osteoarthritis.	3.18 (1.07)	.48	<b>.51</b>	
Pain caused by osteoarthritis indicates the presence of organic injury.	3.06 (1.09)	.54	<b>.51</b>	
Reduction of daily physical exertion is a significant factor in treating pain caused by osteoarthritis.	2.43 (1.20)	.51	<b>.51</b>	
If osteoarthritic pain increases in severity, I immediately adjust the intensity of my treatment accordingly.	3.89 (1.07)	.50	<b>.50</b>	
It is the task of the physiotherapist or GP to remove the cause of osteoarthritic pain.	2.29 (1.16)	.47	<b>.47</b>	
Increased pain indicates new tissue damage or the spread of existing damage.	2.85 (1.09)	.55	<b>.47</b>	
There is no effective treatment to eliminate pain caused by osteoarthritis.*	2.40 (1.20)	.24		
Psychological stress can contribute to pain caused by osteoarthritis even in the absence of significant tissue damage.	5.02 (0.87)	-.27		<b>.62</b>
Functional limitations associated with pain caused by osteoarthritis are the result of psychosocial factors.	3.46 (1.04)	.18		<b>.59</b>
Knowledge of the tissue damage is not necessary for effective therapy	4.05 (1.29)	-.24		<b>.55</b>
The cause of osteoarthritic pain is unknown.	2.86 (1.08)	.06		<b>.54</b>
A patient suffering from severe pain caused by osteoarthritis will benefit from physical exercise.*	5.07 (0.97)	-.20		

Note: GP = General Practitioner, PABS-PT = Pain and Attitudes Beliefs Scale –Physical Therapist. \* indicates items that did not load on to any factor with a score a score greater than .45. Only item scores greater than .45 are included on the table. Scores shown in bold indicate those that comprise the factor.\*\* Factor names: 1 = *Biomedical*, 2 = *Behavioural*.

**Table 30.**

*PABS-PT Subscale Titles, Mean Scores and Cronbach's Alpha Scores, Eigenvalues and Variance Explained Percentages*

Subscale (factor) number	Subscale title	Subscale mean score (SD)	Cronbach's alpha	Eigenvalues	Percentage of variance explained
1	Biomedical	2.78 (0.63)	.84	4.74	23.71
2	Behavioural	3.85 (0.66)	.44	1.72	8.58

Note: PABS-PT = Pain and Attitudes Beliefs Scale for Physiotherapists, SD = Standard Deviation.

### 11.3.3.2 The adapted Clinicians' Knee Osteoarthritis Fears and Beliefs Questionnaire

Two hundred and seventy-four complete individual participant data sets were analysed. Table 31 shows the individual item group mean and the standard deviation. The mean score for most of the items of the section were located between. However, five items scored less than 2 indicating strong disagreement. These items related to beliefs about the limited benefit of exercise, the consequences of having osteoarthritis on mobility and physiotherapists' interest in the disease. The correlation matrix indicated that the data were suitable for principal component analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was .779, above the recommended value of .6, and Bartlett's Test of Sphericity was significant ( $\chi^2(528) = 4361.31, p < .0001$ ). Principal component analysis was undertaken and the scree plot charted, identifying five factors that were located to the left of the elbow, indicating a five-factor solution. The five identified factors explained 48.65% of the total variance. Factors (subscales) were named: *Beliefs about (i) consequences on ADLs and treatment; (ii) patients' perceptions of doctors and physiotherapists; (iii) disease control; (iv) patient misconceptions; (v) aggravating and easing factors*. The item loading for the first component and the rotated factor structure are shown in Table 31, seven items did not load onto any factor with a value of .45 or greater. The Cronbach's alpha for the entire scale was acceptable (.84) and subscale scores ranged from .46 to .92 (Table 32. Subscale group mean scores ranged from those indicating disagreement with the items of the subscale (*Beliefs about consequences on ADLs*) to those indicating agreement with the subscale (*Beliefs about patient misconceptions*: Table 32.). Eigenvalues and percentage variance explained by each factor are presented in Table 32.

**Table 31.**

*Group Mean Items and Standard Deviation Scores, and Rotated Five Factor Analysis of the Adapted Clinicians' KOFBeQ*

Adapted Clinicians' KOFBeQ items	Mean (SD)	Item Loading	Factor**				
			1	2	3	4	5
Most of my patients with knee and/or hip osteoarthritis will soon be unable to walk anymore.	1.97 (1.44)	.69	<b>.79</b>				
Most of my patients with knee and/or hip osteoarthritis will have to stop sports activities.	3.04 (1.96)	.72	<b>.78</b>				
Most of my patients with knee and/or hip osteoarthritis will end up in a wheelchair	1.55 (1.35)	.65	<b>.78</b>				
Most of my patients with knee and/or hip osteoarthritis will have to give up their leisure activities.	2.59 (1.87)	.71	<b>.78</b>				
Most of my patients with knee and/or hip osteoarthritis will not be able to climb stairs anymore.	2.46 (1.67)	.74	<b>.69</b>				
Most of my patients with knee and/or hip osteoarthritis will depend on others for activities of daily living.	2.21 (1.53)	.72	<b>.67</b>				
Physical activities are harmful to knee and hip osteoarthritis.	1.92 (1.54)	.55	<b>.66</b>				
Medications are not helpful for knee and/or hip osteoarthritis.	2.22 (1.66)	.49	<b>.46</b>				
Exercises are useless for knee and/or hip osteoarthritis.*	1.55 (1.63)	.48					
General practitioners usually do not refer patients with knee and hip osteoarthritis to specialists because it is a common and benign disease.	3.80 (2.27)	.28		<b>.72</b>			
Physiotherapists usually do not refer patients with knee and hip osteoarthritis to specialists because it is a common and benign disease.	3.37 (2.08)	.30		<b>.71</b>			
GPs do not have much to offer for people with knee and/or hip osteoarthritis.	3.77 (2.16)	.45		<b>.68</b>			
GPs underestimate pain in knee and hip osteoarthritis.	4.70 (2.32)	.37		<b>.66</b>			
Physiotherapists underestimate pain in knee and hip osteoarthritis.	3.74 (2.07)	.48		<b>.64</b>			
General practitioners (GPs) are not interested in knee and hip osteoarthritis.	3.50 (2.45)	.30		<b>.60</b>			
Physiotherapists are not interested in knee and hip osteoarthritis.	1.90 (1.45)	.57		<b>.52</b>			
Physiotherapists do not have much to offer for people with knee and/or hip osteoarthritis.*	2.10 (1.48)	.47					
The clinical diagnosis of knee and/or hip osteoarthritis can be challenging to make.*	4.31 (2.19)	.34					
Knee and/or hip injections can damage knee cartilage.*	4.24 (2.17)	.20					

Adapted Clinicians' KOFBeQ items	Mean (SD)	Item loading	Factor**				
			1	2	3	4	5
Surgery is inevitable when you have knee osteoarthritis.	2.68 (1.90)	.54			<b>.87</b>		
Surgery is inevitable when you have hip osteoarthritis.	2.74 (1.94)	.52			<b>.86</b>		
Nothing can be done to modify the progression of knee and hip osteoarthritis.	2.48 (1.57)	.46			<b>.56</b>		
Knee and hip osteoarthritis are a fate for which not much can be done.	2.28 (1.55)	.56			<b>.54</b>		
Using a cane gives the image of very old age.*	4.43 (2.38)	.39					
Most of my patients with knee and/or hip osteoarthritis hold inappropriate beliefs about the prognosis of their condition.	6.67 (2.18)	.02				<b>.92</b>	
Most of my patients with knee and/or hip osteoarthritis hold inappropriate beliefs about the treatment of their condition.	6.70 (2.15)	.04				<b>.89</b>	
Most of my patients with knee and/or hip osteoarthritis hold inappropriate beliefs about the cause of their condition.	6.34 (2.20)	-.01				<b>.87</b>	
Traumas are the main cause of knee and hip osteoarthritis.	5.18 (1.94)	.17					<b>.53</b>
Prescribing investigations (i.e. X-ray, MRI) for my patients with knee and/or hip osteoarthritis makes them feel more secure.	5.93 (2.35)	.25					<b>.52</b>
Wet weather makes knee and hip osteoarthritis worse.	4.83 (2.35)	.32					<b>.49</b>
Some diets or food supplementations can prevent knee and/or hip osteoarthritis.	4.50 (2.11)	.20					<b>.48</b>
Knee and hip osteoarthritis is caused by cartilage wear.*	6.83 (1.90)	.10					
Knee and hip osteoarthritis cannot be cured.*	6.55 (2.65)	.06					

Note: Note: GPs = General Practitioners, KOFBeQ = Knee Osteoarthritis Fears and Beliefs Questionnaire, MRI = Magnetic Resonance Imaging, SD = Standard Deviation. \* indicates items that did not load onto any factor with a score a score greater than .45. Only item scores greater than .45 are included on the table. Scores shown in bold indicate those that comprise the factor. \*\* Factor names: 1 = *Beliefs about consequences on ADL and treatment*, 2 = *Beliefs about patients' perceptions of doctors and physiotherapists*, 3 = *Beliefs about disease control*, 4 = *Beliefs about patient misconceptions*, 5 = *Beliefs about aggravating and easing factors*.

**Table 32.**

*Adapted Clinicians' KOFBeQ Subscale Titles, Mean Scores and Cronbach's Alpha Scores, Eigenvalues and Variance Explained Percentages*

Subscale (factor) number	Subscale title	Subscale mean score (SD)	Cronbach's alpha	Eigenvalues	Percentage of variance explained
1	Beliefs about consequences on ADL and treatment	2.25 (1.21)	.88	6.75	20.46
2	Beliefs about patients' perceptions of doctors and physiotherapists	3.54 (1.45)	.81	3.74	11.44
3	Beliefs about disease control	2.54 (1.39)	.81	2.03	6.15
4	Beliefs about patient misconceptions	6.57 (2.03)	.92	1.84	5.57
5	Beliefs about aggravating and easing factors	5.11 (1.36)	.46	1.66	5.04

Note: ADL = Activities of Daily Living, KOFBeQ = Knee osteoarthritis Fears and Beliefs Questionnaire, SD = Standard Deviation.

### 11.3.4 Section 3: Clinical vignette

Data from 273 participants were analysed, and the results of the vignette questions are presented Table 33. Data are presented for the whole sample and for the individual professions. The findings show that significantly more of the GPs indicated that they would refer the person described in the vignette to another clinician. The results indicated a number of professions that most participants would not refer the person to, receiving 10 or fewer referrals. These professions were: chiropractors, osteopaths, pain services and psychology. Significantly more physiotherapists indicated they would be likely to refer the person to podiatry. The most popular treatment options selected by the participants were *advice and education*, and *therapeutic exercise*. GPs' and physiotherapists' answers differed significantly for many (eight of 11) of their chosen treatment modalities for the person. The greatest number of participants indicated that they would give the person advice about weight loss, pacing activities and analgesic use. Significant differences occurred between the two professions for six of the 11 advice categories, as well as the total number of times that the participants would expect to see the person. More physiotherapists expected to see the person described in the case study more times for her osteoarthritis (Table 33).

**Table 33.***Vignette Answers as a Total of all Participants and by Each Profession*

	All participants Yes (%), (n = 272)	GPs Yes (%), (n = 78)	Physiotherapists Yes (%), (n = 194)	Chi-Square test (n = 272)	p-value
Would you be likely to refer this patient to another health care professional?	172 (63.2)	64 (82.1)	108 (55.7)	$X^2(1) = 15.54$	<b>.0001</b>
Would you refer this woman to:					
An acupuncturist?	10 (3.7)	1 (1.3)	9 (4.6)	$X^2(1) = .95$	.330
A chiropractor?	0 (0)	0 (0)	0 (0.0)	N/A	N/A
A dietician?	52 (19.1)	14 (17.9)	38 (19.6)	$X^2(1) = .02$	.888
An exercise physiologist?	10 (3.7)	4 (5.1)	6 (3.1)	$X^2(1) = .20$	.652
A GP? (if this is not your profession)	N/A	N/A	92 (47.4)	N/A	N/A
A pharmacist?	32 (11.8)	5 (6.4)	27 (13.9)	$X^2(1) = 2.34$	.126
An occupational therapist?	10 (3.7)	3 (3.8)	7 (3.6)	$X^2(1) = .00$	1.00
An orthopaedic surgeon	38 (14)	8 (10.3)	30 (15.5)	$X^2(1) = .86$	.354
An osteopath?	1 (0.4)	0 (0)	1 (0.5)	$X^2(1) = .00$	1.00
A pain clinic?	6 (1.8)	0 (0)	5 (2.6)	$X^2(1) = .85$	.357
A physiotherapist? (if this is not your profession)	N/A	57 (73.1)	N/A	N/A	N/A
A podiatrist?	24 (8.8)	2 (2.6)	22 (11.3)	$X^2(1) = 4.29$	<b>.038</b>
A psychologist?	1 (0.4)	0 (0)	1 (0.5)	$X^2(1) = .00$	1.00
A rheumatologist?	17 (6.3)	2 (2.6)	15 (7.7)	$X^2(1) = 1.73$	.188
A support group?	28 (10.3)	9 (11.5)	19 (9.8)	$X^2(1) = .04$	.836
Once you have made your diagnosis, would you suggest:	(n = 273)	(n = 78)	(n = 195)	(n = 273)	
Advice and education?	267 (97.8)	75 (96.2)	192 (98.5)	$X^2(1) = .52$	.473
An intra-articular injection of steroids or similar	20 (7.3)	16 (20.5)	4 (2.1)	$X^2(1) = 25.32$	<b>.0001</b>
Therapeutic exercises?	251 (91.9)	63 (80.8)	188 (96.4)	$X^2(1) = 16.35$	<b>.0001</b>
Rest?	30 (11.0)	8 (10.3)	22 (11.3)	$X^2(1) = .00$	.976
Ice or heat?	138 (50.5)	20 (25.6)	118 (60.5)	$X^2(1) = 25.73$	<b>.0001</b>
Acupuncture?	70 (25.6)	4 (5.1)	66 (33.8)	$X^2(1) = 22.62$	<b>.0001</b>
Manual therapy?	137 (50.2)	6 (7.7)	131 (67.2)	$X^2(1) = 90.60$	<b>.0001</b>



Prescription of simple analgesics?	126 (46.2)	76 (97.4)	50 (25.6)	$X^2 (1) = 112.69$	<b>.0001</b>
Prescription of opioid-based analgesics?	6 (2.2)	5 (6.4)	1 (0.5)	$X^2 (1) = 6.48$	<b>.011</b>
Prescription of non-steroidal anti-inflammatory drugs?	67 (24.5)	39 (50.0)	28 (14.4)	$X^2 (1) = 36.32$	<b>.0001</b>
Strapping or bracing?	89 (32.6)	7 (9.0)	82 (42.1)	$X^2 (1) = 26.26$	<b>.0001</b>
Would you offer any advice as part of your treatment?	(n=273)	(n = 78)	(n = 195)	(n=273)	
Yes	270 (98.9)	78 (100)	192 (98.5)	$X^2 (1) = .21$	.646
Would you offer any advice about:					
The use of knee supports?	90 (33.0)	18 (23.1)	72 (36.9)	$X^2 (1) = 4.23$	<b>.040</b>
Analgesics?	196 (71.8)	65 (83.3)	131 (67.2)	$X^2 (1) = 6.40$	<b>.011</b>
Reducing activity levels?	28 (10.3)	2 (2.6)	26 (13.3)	$X^2 (1) = 5.90$	<b>.015</b>
Weight loss?	237 (86.8)	69 (88.5)	168 (86.2)	$X^2 (1) = .10$	.756
Pacing activities?	220 (80.6)	42 (53.8)	178 (91.3)	$X^2 (1) = 47.54$	<b>.0001</b>
Rest?	48 (17.6)	9 (11.5)	39 (20.0)	$X^2 (1) = 2.20$	.138
Nutrition?	105 (38.5)	27 (34.6)	78 (40.0)	$X^2 (1) = .47$	.491
Increasing level of activity?	150 (54.9)	32 (41.0)	118 (60.5)	$X^2 (1) = 7.78$	<b>.005</b>
Using a walking aid?	132 (48.4)	32 (41.0)	100 (51.3)	$X^2 (1) = 1.95$	.162
Heat or ice?	159 (58.2)	28 (35.9)	131 (67.2)	$X^2 (1) = 21.15$	<b>.0001</b>
Avoiding painful movements?	40 (14.7)	12 (15.4)	28 (14.4)	$X^2 (1) = .00$	.978
How many times would you be likely to see this woman?					
Once	6 (2.2)	4 (5.1)	2 (1.0)	$X^2 (4) = 76.04$	<b>.0001</b>
2 or 3 times	86 (31.6)	52 (66.7)	34 (17.5)		
4 or 5 times	91 (33.5)	18 (23.1)	73 (37.6)		
6 or 7 times	50 (18.4)	1 (1.3)	49 (25.3)		
More than 7 times	39 (14.3)	3 (3.8)	36 (18.6)		

Note: GP = General Practitioner, N/A = Not Applicable, SD = Standard Deviation.

## **11.4 Discussion, recommendations and conclusions**

The results of this study suggest there is limited evidence that the PABS-PT is a reliable and valid measure of clinicians' beliefs in the context of osteoarthritis. However, it appears the adapted Clinicians' KOFBQ shows potential for use, but it does have limitations. The osteoarthritis health, illness and treatment beliefs held by GPs and physiotherapists in this study are similar to best practice guidelines and influenced by their respective professional scopes of practice. Beyond these main findings, there are a number of points that merit further discussion in the context of current research. These points are discussed as they relate to the sections of the survey. The strengths and limitations of the study are then outlined followed by conclusions and recommendations.

### **11.4.1 Section 1: Clinicians' demographic and occupational characteristics**

The demographic and occupational results indicate the GPs and physiotherapists who participated are similar to the wider population of clinicians currently working in New Zealand (New Zealand National Health Board, 2014; Physiotherapy Board of New Zealand, 2016). Participants included clinicians with a range of different experience levels, frequency of treating people with hip or knee osteoarthritis, employment settings, and geographical locations. However, considerably more physiotherapists participated in the study than GPs. Previous research has referred to the challenges of recruiting GPs to studies of this nature, citing causes for low research recruitment rates as survey fatigue and high workloads (Cottrell et al., 2015; Cottrell, Foster, Porcheret, Rathod, & Roddy, 2017).

A significantly higher percentage of GPs than physiotherapists indicated they would typically refer people with osteoarthritis to other professions. This finding may be a result of differences in the clinical role of each profession in the treatment of osteoarthritis. GPs typically have more of a diagnostic-screening and healthcare-gatekeeper role and as such, referral to other clinical services may be more common (Brand et al., 2014). In contrast, physiotherapists typically provide treatment services, hence referral to other clinicians is less indicated (Bennell, 2013). The three professions or services that participants most commonly indicated they refer people with

osteoarthritis to were radiology, orthopaedic surgery and Green Prescription (a publically funded community-based exercise and activity service). This finding is not surprising, because X-ray is still considered a key diagnostic tool, exercise is the first line of conservative treatment, and surgical joint replacement is common and effective for reducing pain (Bennell & Hinman, 2011; Hochberg, Silman, Smolen, Weinblatt, & Weisman, 2015; Leskinen, Eskelinen, Huhtala, Paavolainen, & Remes, 2012).

In contrast, only a few participants indicated they would refer people with hip and/or knee osteoarthritis to dieticians, psychologists and occupational therapists. A high body mass index score is a known risk factor for developing osteoarthritis and an aggravating factor with osteoarthritis (Hochberg et al., 2015). Therefore, it would seem logical that referral to dieticians, to help with weight loss when appropriate, would be beneficial. Similarly, many people with osteoarthritis describe the impact of the disease on their mental and emotional well-being (Bijsterbosch et al., 2009; Brembo et al., 2016; Sharma et al., 2016). Thus, engaging the services of a psychologist could be beneficial for these people. Limitations of activities of daily living and mobility are common, as is chronic fatigue (Hegarty, Treharne, Stebbings, & Conner, 2016; Murphy et al., 2013; Palmer, 2012). Hence, a benefit may be obtained from the occupation therapy services to facilitate pacing and coping, as well as prescription of functional aids (Stukstette et al., 2012).

Three factors may explain the findings about clinicians' referral practices. One, GPs and physiotherapists may see little efficacy in these services or have a limited understanding of what these professions could offer people with osteoarthritis. These beliefs are known to affect referral of people with osteoarthritis to conservative treatment programmes (Chevalier et al., 2004). Two, the current funding model in New Zealand does not typically facilitate referral for people with osteoarthritis to these services, because patients have to pay for these services. Cost and funding models are known to affect the manner in which clinicians in primary care services practice and refer (Stokes, Tumilty, Doolan-Noble, & Gauld, 2017). Furthermore, Stokes et al. (2017) found that the current primary care funding model in New Zealand has led to fragmentation of care for people living with chronic multi-morbidity. Three, the findings may be due to poor or limited communication between health professionals. If GPs and physiotherapists do not practise with clinicians from these professions regularly, they may not consider

including these professions in an integrated or collaborative approach to osteoarthritis treatment (Hall, 2005; Westby & Backman, 2010).

### **11.4.2 Section 2: Clinicians' health, illness, and treatment beliefs**

The results indicated limitations with the PABS-PT for use in the context of osteoarthritis, whereas the adapted Clinicians' KOFBeQ appeared more promising.

#### ***11.4.2.1 The adapted Pain Attitudes and Beliefs Scale for Physiotherapist***

The results of the PABS-PT subscale scores indicate that participants had greater levels of agreement with items that related to a behavioural approach to healthcare, supporting the notion that participants held beliefs that were located in a Biopsychosocial approach to care. However, the poor internal consistency of the Behavioural subscale draws into question the utility of the subscale and the measure. This is not a new finding and indicates an inability of the measure to reliably assess the construct (Bishop & Yardley, 2010; Bowey-Morris, Purcell-Jones, & Watson, 2010; Mutsaers et al., 2014; Ostelo et al., 2003).

The poor internal consistency of the Behavioural subscale may be due to three factors. First, the limited ability of the items of the scale to fully explain the complexity of the construct. The subscale has been amended and modified by a number of authors to resolve this problem, yet it still remains (Bishop et al., 2008; Mutsaers et al., 2014; Sit, Yip, Chan, & Wong, 2015). This issue may be compounded by inconsistent interpretation of the behavioural items. Ip et al. (2015) indicated that such problems could relate to differences in the belief anchors or the points that link a belief in either the biomedical or biopsychosocial belief systems. The authors explored health and illness beliefs with people with diabetes and found that anchors that were biomedically located were reported more consistently than those that were not (Ip et al., 2015).

Second, continued issues with the internal consistency may relate to the complex nature of the Behavioural or Biopsychosocial construct. When first proposed, the Biopsychosocial model of health was comprised of four components that were equally important for a person's well-being; biological, psychological, social and cultural (Engel 1977). The PABS-PT places the biomedical beliefs into one subscale and behavioural beliefs, comprising of psychological, social and cultural statements, into the other subscale (Bishop et al., 2008; Ostelo et al., 2003). It is argued that these three

components suggest very different aspects of a person's wellbeing and as such do not necessarily group together as a single construct (Duncan, Bishop, & Foster, 2016). Furthermore, the behavioural subscale typically only consists of a small number of items (Mutsaers et al., 2012). Such a limited number of items cannot convincingly explore such diverse and complex notions of well-being.

Third, it is incorrect to conceptualise the Biomedical and Biopsychosocial Models as independent. The Biopsychosocial Model of healthcare delivery was developed as an extension of the Biomedical Model, not an independent model (Engel, 1977). Therefore, attempting to create a scale that places beliefs into one of two categories (biomedical or behavioural/biopsychosocial) may be conceptually flawed because the two categories are interdependent. The biomedical approach to healthcare is an important part of the Biopsychosocial Model. Consequently, attempting to differentiate biopsychosocial beliefs from biomedical beliefs may not be possible. Recently, Duncan et al. (2016) used concept mapping to explore clinicians' conceptualisation of the biopsychosocial approach, in the context of musculoskeletal care. The authors proposed a more complex interpretation of the Biopsychosocial Model that included six primary domains: bio-clinical, therapeutic relationship, individual patient aspects, emotions, social, and work (Duncan et al., 2016). Other researchers have explored the complexity of how clinicians conceive their approach to clinical practice (Thomson, Petty, & Moore, 2014). Thomson et al. (2014) propose a more intricate conceptualization of clinical practice than the biopsychosocial approach suggests. The authors argue that a clinicians' conception of clinical practice is influenced by multiple factors, including their educational experience, view of health and disease, the epistemology of practice knowledge in which they practice, the theory-practice relationship, and their perceived therapeutic role (Thomson et al., 2014). Moreover, clinical practice can be further affected by the therapeutic relationship, and whether the clinician employs a patient-centered or practitioner-center approach to care (Thomson et al., 2014).

#### ***11.4.2.2 Adapted Clinicians' Knee Osteoarthritis Fears and Beliefs Questionnaire***

The results show that adaptation of the KOFBeQ for collecting data about clinicians' beliefs about hip and knee osteoarthritis was promising, and the questionnaire may merit further future development. The PCA supported the previously identified factor structure, with the inclusion of the additional factor about patient misconceptions (Benhamou et al., 2013). Furthermore, four of the five subscales (factors) had

acceptable internal consistency and the subscale scores provided insight into clinicians' beliefs about osteoarthritis.

Benhamou et al. (2013) identified a four-factor solution for the original KOFBeQ, but the new factor reflects the items added to the questionnaire to explore clinicians' beliefs about patient misconceptions. Three items grouped together to form the factor, which was called *Beliefs about patient misconceptions*. This additional factor had acceptable internal consistency, the items made good conceptual sense, and results support the inclusion of the items. The group mean score indicated that most of the participants agreed that patients with hip and/or knee osteoarthritis held inappropriate beliefs about the cause, prognosis and treatment of their condition. However, the factor is constructed of only three items, hence caution should be applied as the factor may not explore all of the facets of the construct (Portney & Watkins, 2009).

Three of the remaining four factors of the adapted Clinicians' KOFBeQ had acceptable internal consistency, and shared a number of similarities with the factor structure proposed by Benhamou et al. (2013). These factors, which focus on beliefs about ADLs, doctors and disease control, are conceptually similar to the results of Benhamou et al. (2013). However, one factor differed from those previously identified. The fifth factor of the adapted Clinicians' KOFBeQ was called *Beliefs about aggravating and easing factors* and had poor internal consistency. In contrast, the final factor identified by Benhamou et al. (2013) was characterised as *Fears and beliefs about sports and leisure*. The differences may be explained by the inclusion criteria of the studies, one including people living with knee osteoarthritis and clinicians in the current study. Further explanation may be the small number of items contained within both factors, four items in the present study and two in the study by Benhamou et al. (2013). The poor internal consistency of the *Beliefs about aggravating and easing factors* could be explained by examination of the items contained within the factor, such as *Traumas are the main cause of hip and/or knee osteoarthritis*, and *Some diets or food supplementations can prevent hip and/or knee osteoarthritis*. The results show that there is limited conceptual sense to the item grouping.

The adaptation of the KOFBeQ for use with clinicians is promising. However, the questionnaire has one considerable limitation; it is not underpinned by a theoretical model of health and illness perception or clinical practice. While Benhamou et al. (2013) argued that the questionnaire was developed from existing patient health and

illness beliefs models, there is no clear link. Hence, the adapted Clinicians' KOFBeQ can only be regarded as a practical a-theoretical questionnaire that measures clinicians' beliefs about hip and knee osteoarthritis. Furthermore, as the sample contained a considerably larger number of physiotherapists than GPs, caution should be applied when considering the results as they may be more indicative of physiotherapists' osteoarthritis beliefs.

### 11.4.3 Section 3: Clinical vignette

The results show that participants' supported treatment practices that are in keeping with current best-practice recommendations for treatment of people with hip and/or knee osteoarthritis (Fransen et al., 2015; McAlindon et al., 2014; Merashly & Uthman, 2012). *Advice and education* and *therapeutic exercise* were the most popular interventions considered appropriate for the person described in the vignette. Additionally, the majority of participants indicated that they would employ therapeutic exercise, similar to findings of previous research using this vignette (Holden et al., 2008). Moreover, this finding suggests that participants perceive value in the use of therapeutic exercise for people with moderate knee osteoarthritis. The most popular advice categories were *weight loss*, *pacing activities* and the use of *analgesics*. Again, these results imply that participants were conscious of the known benefits of these interventions. A number of significant differences were seen in the recommended treatments and advice given between the two professional groups (GPs and physiotherapists). However, most of these differences can be explained by differences in the scope of practice of each profession. For example, significantly more GPs advocated prescription of medication, whereas more physiotherapists advocated treatment such as pacing, therapeutic exercises or manual therapy.

There were two areas where the findings suggest beliefs or behaviours that differed from clinical best practice. First, the findings indicate that the participants may not merit including some healthcare professionals in the treatment of people with hip and/or knee osteoarthritis. Osteoarthritis is known to affect people's psychological and social well-being (Brembo et al., 2016; Hawker, Gignac, et al., 2011; Murphy et al., 2013; Sharma et al., 2016). However, very few participants indicated that they would refer the woman to either a support group or a psychologist. The low rates may be due to the perceived efficacy of the services that these groups provide, or beliefs about the cost of accessing

these services for people with osteoarthritis. Furthermore, the finding might be due to these services not being located within either the biomedical or biomechanical view of osteoarthritis.

Second, very few participants specified that they would refer the person to a dietician despite 86.9% of participants indicating the importance of providing advice about weight loss. Obesity is a known risk factor for developing knee osteoarthritis (Silverwood et al., 2015). Furthermore, weight loss is known to reduce disease progression in people with knee osteoarthritis (Van Manen et al., 2012). Therefore, this result is somewhat surprising and the reason for this finding is unclear. Possible explanations for these findings may relate to the limited funding of dietetic services in New Zealand, the perception that weight loss advice can be provided by any healthcare professional, or that effective weight loss is too challenging for people with hip and/or knee osteoarthritis.

#### **11.4.4 Strengths and limitations of the study**

The study has four strengths. One, the adaptation and use of existing questionnaires (PABS-PT and KOFBeQ) increased the generalizability of the findings, and allowed for comparison with previous research. Two, the demographic and occupational characteristics indicate that people who participated were representative of the wider population of GPs and physiotherapists in New Zealand. Three, the sample size allowed for appropriate statistical analysis of the adapted PABS-PT and the adapted Clinicians' KOFBeQ. Four, administration of the survey online enabled wider dissemination of the survey.

The study had three limitations. One, twice as many physiotherapists as GPs completed the survey. Therefore, the findings may be biased towards physiotherapists' beliefs. Two, the high survey dropout rate (7.8%) may reflect survey fatigue and indicate that the survey was too long for some participants. Three, while the clinical vignette provides insight into clinicians' practice behaviours, the results may be biased by participants inadvertently reporting socially desirable behaviours. Therefore, the reported behaviours may not reflect actual clinical practice.



#### **11.4.5 Recommendations and conclusions**

The results point to the need for a questionnaire that better explores clinicians' beliefs about osteoarthritis, and there may be some merit in further adapting the Clinicians' KOFBeQ for use in this context. The GPs and physiotherapists in this sample hold beliefs about osteoarthritis that are in keeping with current recommendations for treatment, but it seems that better collaboration with other healthcare professions is needed.

## Chapter 12 Discussion, recommendations for future research and clinical practice, and conclusions

This chapter includes a discussion about hip and/or knee osteoarthritis health, illness and treatment beliefs identified by the studies contained in this thesis; the utility of current measures of hip and knee osteoarthritis health, illness and treatment beliefs; and models of osteoarthritis health, illness and treatment beliefs. This is followed by a consideration of the strengths and limitations of the thesis, recommendations for future research, implications for clinical practice, and conclusions.

### 12.1 Discussion

One aim of this thesis was to identify, compare and contrast the osteoarthritis beliefs held by New Zealanders living with hip and/or knee osteoarthritis and the clinicians who treat the condition. Both groups described a broad range of beliefs about osteoarthritis, many of which were in line with current literature and best practise management. Some beliefs were similar between the two groups, but there were also a number of differences.

The other aim of the thesis was to identify whether people's and clinicians' osteoarthritis beliefs could be measured by existing questionnaires that are grounded in theoretical health, illness or treatment belief models. The thesis identified that a variety of questionnaires are currently used to explore people's and clinicians' health, illness and treatment beliefs. However, no identified beliefs questionnaire was entirely suitable for the purpose of measuring osteoarthritis health, illness and treatment beliefs and few of the appraised questionnaires were underpinned by theoretical models. The results indicated that current health, illness and treatment beliefs models did not fully explain the beliefs of people living with hip and/or knee osteoarthritis, and did not appear to explain clinicians' beliefs in New Zealand.

#### 12.1.1 Hip and/or knee osteoarthritis health, illness and treatment beliefs

##### *12.1.1.1 Beliefs of people living with osteoarthritis*

The findings of both the qualitative descriptive study and cross-sectional survey of people's osteoarthritis beliefs indicate that participants held a number of health, illness

and treatment beliefs that were in keeping with current literature (Hochberg et al., 2015; National Institute for Health and Care Excellence, 2015). Both studies showed participants had adequate knowledge of the causes and symptoms attributable to osteoarthritis. Moreover, most of the findings from the two studies were similar. Participants cited pain, joint stiffness and loss of strength as the main symptoms of osteoarthritis; and hereditary factors, ageing and accident or injury as the chief causes of the disease. All of which are supported by current literature (Hochberg et al., 2015; Palazzo et al., 2016). Furthermore, most participants reported being knowledgeable about the benefits of conservative interventions, such as exercise and weight loss. Similarly, the results of the KOFBeQ showed that the majority participants specified that exercise was beneficial for people with osteoarthritis. These findings are encouraging, as they suggest that New Zealanders living with hip and/or knee osteoarthritis have an awareness of the benefits of exercise, as advocated by best practice guidelines (Fransen et al., 2015; Hunter & Lo, 2009; Merashly & Uthman, 2012; Zhang et al., 2008). However, researchers have shown that a positive view of exercise does not necessarily correlate with higher the levels of exercise adherence or lead to changes in level of physical activity undertaken by people with osteoarthritis (Gay, Eschaliere, Levycky, Bonnin, & Coudeyre, 2017).

The results of both studies showed that participants with osteoarthritis of their hips and/or knees wanted clear advice about conservative treatment and assistance from clinicians when navigating health care services for their condition. In particular, these people valued exercise but wanted guidance on how to exercise safely. Some participants stated that clinician interactions had provided them with only a small amount of useful information. These findings could be due to limitations in the clinician's osteoarthritis knowledge or their belief that conservative management is ineffective, as demonstrated by previous studies (Conrozier et al., 2008; Cottrell, Roddy, Rathod, Porcheret, & Foster, 2016). Authors argue that poor utilisation of conservative management of osteoarthritis can be attributed to inappropriate beliefs held by clinicians (Bennell et al., 2014; Hunter, 2011, 2017; Hunter & Lo, 2009; Hunter et al., 2011). Furthermore, the limited guidance of exercise and facilitation of exercise adherence was previously identified as a barrier to exercising for people with osteoarthritis (Bennell et al., 2014; Hofstede et al., 2016; Hunter, 2017).

Many participants expressed the importance of effective communication with clinicians. In particular, the findings from the qualitative study highlighted the perceived benefits of good communication. The role of a positive patient-clinician interaction is recognised as contributing to the successful management of chronic musculoskeletal conditions (Brembo et al., 2016; Duncan et al., 2016; Webster et al., 2013). Participants also stressed the negative impact of poor communication. Poor communication is a known barrier to successful engagement with conservative management (Paskins, Sanders, Croft, & Hassell, 2015; Paskins, Sanders, & Hassell, 2014). Research shows that poor communication is compounded by clinicians not legitimising people's osteoarthritis symptoms, not considering the symptoms as a priority to the patient, or by attributing symptoms to ageing, and wear and tear (Coxon et al., 2015; Erwin et al., 2017a; Paskins et al., 2015).

The findings of the qualitative and quantitative studies demonstrated that participants believed the effect of osteoarthritis extends beyond physical well-being, as it also impacts on people's psychological, social and occupational well-being. The findings showed that osteoarthritis could also affect participation in family, social and employment activities. Moreover, there were numerous experiences reported about osteoarthritis affecting emotional and psychological well-being. Participants described feeling fearful, angry, anxious and frustrated. Some participants expressed the desire for the wider impact of the disease to be acknowledged by more consulting clinicians. These findings are not unique and are supported by other researchers who have indicated that people want a treatment that works for them in their context (Brembo et al., 2016; Carmona-Terés et al., 2017; Erwin et al., 2017a; Paskins et al., 2014).

Methodological factors may have influenced the findings from these two studies. Both of these studies primarily recruited participants through Arthritis New Zealand. This recruitment method may have led to participants who were better informed about osteoarthritis than the general population. Also, the use of the sequential-exploratory mixed-methods design may explain some of the similarities between the qualitative and quantitative studies. The qualitative descriptive study guided the selection of the questionnaires used in the survey. Therefore, any bias of the qualitative study may have affected the selection of questionnaires and, in turn, influenced the results of the survey. Nevertheless, one notable difference between the findings of the two studies was seen. The qualitative findings showed that participants perceived surgical joint replacement as

inevitable, whereas the findings from the KOFBeQ did not fully support this. The different methodologies of the two studies may explain this outcome. The qualitative descriptive study included a small sample. Participants in this sample may have had beliefs about surgery that differed from those of the wider population represented by the survey participants.

#### ***12.1.1.2 Clinicians' osteoarthritis beliefs***

Overall, the results from the qualitative and quantitative studies of clinicians' osteoarthritis beliefs indicate that clinicians held beliefs about osteoarthritis in keeping with evidence-based practice guidelines (Bennell & Hinman, 2011; Fransen et al., 2015; National Institute for Health and Care Excellence, 2015). The majority saw benefit in conservative treatment approaches such as exercise, physical activity and weight loss. However, the strong advocacy for exercise and physical activity may have been influenced by the high proportion of physiotherapists in both studies. Furthermore, by participating in the studies clinicians may have been cued to provide answers they believed were in keeping with best practice guidelines (Kalton & Schuman, 1982). Hence, the clinicians' studies in this thesis may have inadvertently become more of an exploration of clinicians' knowledge about osteoarthritis guidelines, than about their osteoarthritis health, illness and treatment beliefs. Cottrell et al. (2017) explored a similar issue amongst UK GPs and concluded that the clinicians' knowledge of osteoarthritis was informed by their understanding of clinical guidelines, but this knowledge was superficial and did not necessarily lead to effective exercise prescription of for these patients. Furthermore, Berube et al. (2017) indicated that it could be easy to change clinicians' knowledge, but this change did not necessarily result in changes in their clinical practice behaviour.

Findings from both clinicians' studies suggest that limited collaboration occurs between clinicians during the delivery of osteoarthritis treatment to people with hip and knee osteoarthritis in New Zealand. Best practice guidelines advocate for integrated clinical services for people with osteoarthritis enabling effective collaboration between health care professionals (National Institute for Health and Care Excellence, 2015). However, some clinical services are disjointed and inefficient, and communication is poor (Brand & Cox, 2006; Egerton, Diamond, Buchbinder, Bennell, & Slade, 2016; Hunter, 2017; Kingsbury & Conaghan, 2012). Three factors may explain this limited collaboration between clinicians. One, the participants may see little efficacy in services offered by

other health professions or have a limited understanding of what each of these professions could offer people with osteoarthritis. Such beliefs are known to affect referral of osteoarthritis patients elsewhere (Chevalier et al., 2004). Two, patients with osteoarthritis have to pay more for additional services than for other subsidised services, such as general practice, because the current funding model in New Zealand does not typically facilitate referral of these people to clinical services offered by psychologists, occupational therapists and dieticians (Ministry of Health, 2015). Cost and funding models are known to affect the manner in which clinicians in primary care services practise, including their referral behaviours (Stokes et al., 2017). Stokes et al. (2017) found that the current primary care funding model in New Zealand has led to fragmentation of care for people living with chronic multi-morbidity. Three, an integrated or collaborative approach to treatment could be seen as a too complex or too challenging a manner in which to practice (Erwin et al., 2017a; Erwin, Edwards, Woolf, Whitcombe, & Kilty, 2017b; Hall, 2005; Westby & Backman, 2010).

Clinicians who participated referred to the challenges of engaging patients in rehabilitation for osteoarthritis, as well as facilitating ongoing adherence to the treatment. The problem is common and has been identified in numerous studies (Bennell et al., 2014; Bennell, Kyriakides, Hodges, & Hinman, 2014; Dockerty, Latham, & Smith, 2016; Erwin et al., 2017a; Hunter, 2017). Furthermore, participants expressed the importance of clinicians being cognisant of this issue and described multiple approaches to addressing the problem. Some researchers claim that, while clinicians may appreciate the importance of facilitating treatment adherence and addressing the barriers faced by people with osteoarthritis, few are practising and prescribing treatment in ways that facilitate adherence (Bennell et al., 2014; Cottrell et al., 2017; Dobson et al., 2016).

Two findings linked to negative beliefs about osteoarthritis treatment in New Zealand, were identified in the clinicians' qualitative study but were not obvious in the quantitative study. First, some participants raised concerns about the effectiveness of the current delivery of conservative treatments. In particular, these clinicians suggested that exercise programmes for people with osteoarthritis were often poorly prescribed. This is not unique, as several previous studies have cited poor exercise prescription as a barrier to effective conservative management of hip and knee osteoarthritis (Bennell et al., 2014; Cottrell et al., 2016; Dobson et al., 2016; Hunter, 2017; Hunter et al., 2011).

Second, some participants presented views about osteoarthritis treatment that were somewhat fatalistic and referred to the limited benefit of treating older people with osteoarthritis. They suggested it was more important to treat younger people with osteoarthritis, as these patients had longer to live with the condition and the associated disability. These findings may indicate why some older people with osteoarthritis feel that their arthritis symptoms are trivialised by health professionals who appear disengaged with them and dismissed as a normal part of ageing (Paskins et al., 2014; Smith et al., 2014). Research shows that people who develop osteoarthritis symptoms earlier do not necessarily go on to have greater levels of disability (Conaghan et al., 2015). Furthermore, no studies were found that showed an association between a patient's age and his or her response to treatment. In contrast, increasing age is shown to positively correlate with higher levels of treatment adherence (Damush, Perkins, Mikesky, Roberts, & O'Dea, 2005). Higher levels of adherence, in turn, may lead to better treatment outcomes for older patients, especially for exercise-based treatment where adherence is essential for patient improvement.

Three methodological factors may explain why some beliefs were only present in the findings from the qualitative study. First, the participant inclusion criteria differed between the two clinicians' studies. The quantitative study only included GPs and physiotherapists, whereas the qualitative study included clinicians from a number of different professions (orthopaedic surgeons, a rheumatologist, and a sports physician). Therefore, the wider professional affiliations of these people may have led to a broader range of issues being discussed in that study. Second, the recruitment methods lead to considerably more physiotherapists than other health professionals participating in both studies. Hence, the findings may be biased towards the beliefs of physiotherapists. Third, the different methods of data collection may have affected the results. The semi-structured interviews could have enabled broader findings of beliefs than the PABS-PT or the KOFBeQ did, but the difference may also suggest limitations of both questionnaires.

### **12.1.2 Similarities and difference between the beliefs of people with osteoarthritis and the clinicians who treat the condition**

Three main similarities were noted between the beliefs of people living with osteoarthritis and the clinicians treating the condition, that warrant further discussion.

First, both groups described the merit of conservative treatments, but suggested that the clinical services currently available to people with hip and/or knee osteoarthritis in New Zealand needed improvement. In particular, participants from both groups indicated that people were often left to manage on their own, with little clinical supervision or guidance. Research shows that this finding is not unique (Bennell et al., 2014; Erwin et al., 2017a; Hunter, 2017). Second, both groups of participants expressed the importance of effective communication between patients and clinicians, and collaboration between clinicians. Good communication is known to lead to improvements in treatment engagement and adherence, and patient satisfaction (Bennell et al., 2014; Brand & Cox, 2006; Hofstede et al., 2016; Street Jr., Makoul, Arora, & Epstein, 2009). Additionally, it has been advocated that an inter-professional collaborative approach to care should be used by clinicians when treating people with chronic health conditions such as osteoarthritis (Bain et al., 2012; Epstein & Street, 2011; Hunter, 2017; Körner, 2010; Nicholls et al., 2009). Third, many of the participants acknowledged that osteoarthritis extended beyond the purely physical signs and symptoms. Furthermore, both groups agreed that osteoarthritis treatment should be holistic because of the multi-faceted nature of the disease. The value of treating people with osteoarthritis holistically has been acknowledged previously and is integral to the best practice guidelines (Alami et al., 2011; Erwin et al., 2017a; National Institute for Health and Care Excellence, 2015; Sharma et al., 2016).

Two features may explain the similarities seen between the findings from studies of people's and clinicians' osteoarthritis beliefs. First, the participants' previous experiences of the current clinical osteoarthritis treatment services available in New Zealand will have informed their beliefs about the need for improvement. While patients and clinicians will have their unique perspective on clinical services, both groups are commenting on the same phenomenon. Hence, it is expected that they would report similar beliefs, but it is promising that both groups describe a similar problem, as this may lead to changes in clinical osteoarthritis services. Second, many of the best-practice guidelines that direct clinicians' knowledge development have been informed by studies that explore the patients' experiences of living with hip and/or knee osteoarthritis. Therefore, the clinicians' knowledge about osteoarthritis treatment would be expected to be similar to the needs of their patients. However, research shows that clinicians' knowledge does not necessarily correlate with practice behaviours (Bérubé et



al., 2017; Cottrell et al., 2017). Thus, it cannot be assumed that the findings from this thesis reflect clinicians' practice behaviours.

There are three differences between the findings from the studies of people's and clinicians' osteoarthritis beliefs that are worthy of further discussion. First, evaluation of *Beliefs about consequences on ADLs and treatment* subscale of the KOFBeQ show a notable difference between the two groups. People living with osteoarthritis believe that the condition will have a greater effect on their functional ability than the clinicians do. This finding may be explained by the known disparity between assessing a person's functional ability in a clinical setting versus in their everyday environment (Taylor, Stretton, Mudge, & Garrett, 2006). The more controlled environment of the clinical setting can lead clinicians' to overestimate their patient's functional ability.

Second, the comparison between the *Beliefs about disease control* subscale scores of the KOFBeQ reveals that clinicians disagreed more strongly with the treatment control subscale than people living with the condition. The greater level of disagreement on this subscale indicates that clinicians perceived more benefit in available osteoarthritis treatments than the people living with the disease did. This difference may suggest why some patients don't engage in conservative treatment. The source of each groups' knowledge and understanding about osteoarthritis treatment may impact knowledge and beliefs. Clinicians predominantly gain knowledge from informed sources, whereas patients are known to gain knowledge from a wide variety of different sources such as the internet, family, friends, media, as well as healthcare professionals (Dieppe, Goldingay, & Greville-Harris, 2016).

Third, the findings from the clinicians' studies suggest that they believe that people with osteoarthritis hold many misconceptions about the disease. In contrast, the studies of people's beliefs indicate that overall they have acceptable knowledge about some aspects of the disease such as causes, signs and symptoms attributable to osteoarthritis, and the benefit of physical activity and exercise. The method of recruitment may partially explain this finding. Recruiting participants for the people's study of osteoarthritis beliefs through Arthritis New Zealand may have inadvertently resulted in participants being better informed about some aspects of osteoarthritis than the general population.

The differences in beliefs about functional ability, treatment efficacy and knowledge between people living with hip and/or knee osteoarthritis and clinicians could influence therapeutic relationships between individuals from each group. Furthermore, the differences may support the findings in similar research that show people with osteoarthritis feel that their symptoms are not heard or are trivialised by clinicians (Coxon et al., 2015; Erwin et al., 2017a; Paskins et al., 2015). Trede (2012) indicated that tensions could develop in the patient-clinician relationship when there are differences between the scientific reasoning of health professional and the social reality of the treatment in the context of their patients' lives. Additionally, Trede (2012) stated that it was important for clinicians to translate their professional knowledge into a format that was acceptable to their patients. Moreover, when translating this knowledge, clinicians need to be mindful of their patients' physical and psychological well-being, as well as the social and cultural environment in which they live (Trede, 2012).

The interpretation of the comparisons between the findings of the studies of people's and clinicians' beliefs should be considered with some caution for two reasons. First, the people who participated in the two studies of people's beliefs were reporting their health, illness and treatment beliefs. Whereas, the clinicians who participated in the studies were reporting health, illness and treatment beliefs based on a self-determined average patient with osteoarthritis and the vignette case study. Additionally, while the clinicians were reporting their beliefs about osteoarthritis, they would have also inadvertently been influenced by their knowledge about the condition. Second, the items that comprised the subscales of the Adapted KOFBeQ and the Adapted Clinicians' KOFBeQ differed slightly. Therefore, they could be exploring slightly different constructs. However, the majority of items did overlap between the subscales identified with the two groups, and it is usually expected that PCA analysis with the same questionnaire will differ slightly between samples (Moss-Morris et al., 2002).

### **12.1.3 Models of osteoarthritis health, illness and treatment beliefs**

The findings from the studies contained in this thesis partially align with a number of health, illness and treatment beliefs models. Findings show there is limited evidence to support the use of the IPQ-R to explore the health, illness and treatment beliefs of people with hip and knee osteoarthritis. Hence, the findings only partially endorse the Common Sense Model (CSM) for use with this population, in contrast to previous

research (Bijsterbosch et al., 2009; Kaptein et al., 2010a). Some of the beliefs presented in the thesis extend beyond the constructs that can be explained by the CSM. In particular, the importance of strong therapeutic relationships between people living with osteoarthritis and their clinician(s). The findings support previous research showing that these relationships can influence the beliefs people have about their health, illness and treatment (Egerton et al., 2016; Geryk, Blalock, DeVellis, Morella, & Carpenter, 2016). Additionally, there was little evidence to suggest that people with osteoarthritis hold beliefs about the condition that are underpinned by a strong biomechanical view. This thesis also demonstrates that the impact of osteoarthritis extends beyond physical symptoms, and influences people's social and psychological well-being. Consequently, the CSM may be useful in explaining some of the health, illness and treatment beliefs held by individuals living with hip and/or knee osteoarthritis in New Zealand but it does not explain all beliefs. A more comprehensive model that better reflects all of the beliefs held by these people may be required.

Findings from this thesis suggest that clinicians who participated held beliefs about osteoarthritis that were located more in the Biopsychosocial than the Biomedical Model. However, limitations were identified in the questionnaires designed to measure the clinicians' biopsychosocial beliefs that may reflect limitations of the current conceptualisation of the model. The results of this thesis may be better explained by a reconceptualised version of the Biopsychosocial Model. Researchers have challenged the current conceptualisation of the Biopsychosocial Model (Duncan et al., 2016; Thomson et al., 2014), with Duncan et al. (2016) proposing a multifaceted interpretation of the model designed to be used in musculoskeletal care. Moreover, this thesis highlights the importance of effective communication between patients and clinicians, and inter-professional collaborative practice between clinicians, approaches that are endorsed for use in osteoarthritis care by researchers and best practice guidelines (Brand & Cox, 2006; Epstein & Street, 2011; Erwin et al., 2017b; National Institute for Health and Care Excellence, 2015; Street Jr. et al., 2009). Therefore, any future clinicians' model of health, illness and treatment beliefs and/or knowledge about osteoarthritis should acknowledge the importance of these approaches.

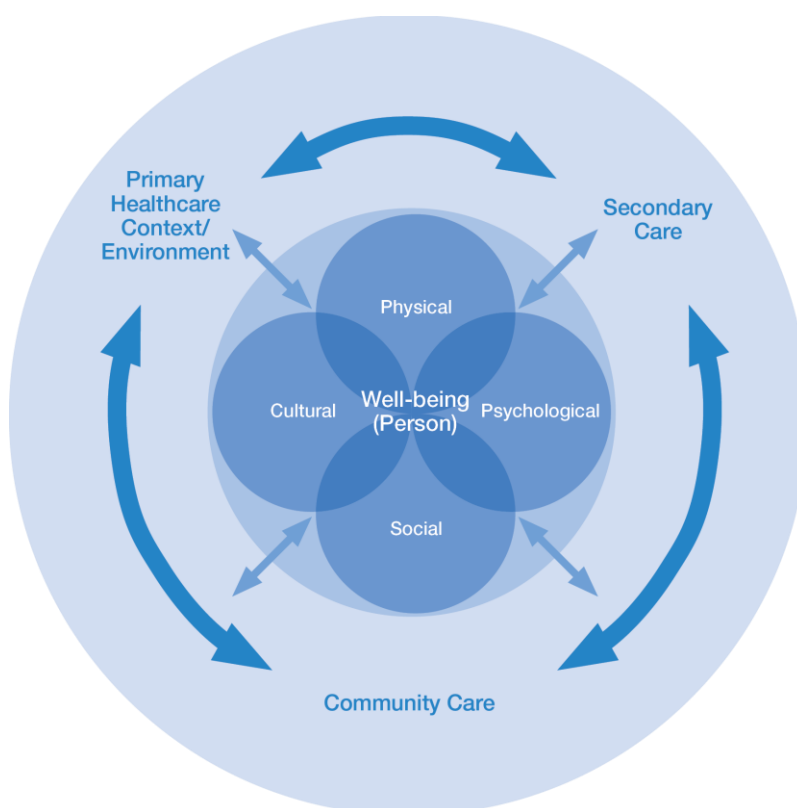
#### 12.1.4 A shared model of osteoarthritis beliefs

Using two separate theoretical models or frameworks to explore and understand health, illness and treatment osteoarthritis beliefs and/or knowledge may perpetuate some of the identified differences between people with the disease and clinicians. The two models with the most potential to explain people's and clinicians' osteoarthritis beliefs were the CSM and a reconceptualised Biopsychosocial Model. However, neither of these models incorporate inter-professional collaboration nor effective communication, concepts shown to be important in the findings from both this thesis and previous research (Erwin et al., 2017a; Hunter, 2017; Kingsbury & Conaghan, 2012). The solution may be a shared model or framework that incorporates the beliefs of people with hip and/or knee osteoarthritis and the knowledge and attitudes of clinicians, in a way that matches best practice guidelines.

*Figure 11* presents a proposed shared model or framework of osteoarthritis health, illness and treatment beliefs. The five key aspects of the proposed model (psychological, physical, social and cultural well-being, and collaborative communication) are well supported by the findings of this thesis and those of current literature. The model shows a person's overall well-being located at the centre, which is constructed from beliefs about physical, psychological, social, and cultural well-being. These beliefs overlap and are not discrete. The model draws together the key constructs of the Biopsychosocial Model, person (patient)-centred practice and interprofessional collaborative practice (Carmona-Terés et al., 2017; Engel, 1978; Thistlethwaite, Jackson, & Moran, 2013). The person's beliefs of well-being are located in the context of the health care environment in which he or she lives. The term well-being is used instead of health because the latter is often defined as the absence of biological disease, whereas well-being encompasses a more holistic view of wellness (Hall et al., 2008; Magklara & Morrison, 2016).

Communication and collaboration occur between the person and his or her healthcare environment, and between the different services within the healthcare environment. For example, between community care (the community-based exercise and lifestyle programmes), primary care (the general practitioner) and secondary care (the orthopaedic surgeon). The arrows indicate the clinical interactions that happen, these interactions occur around and in collaboration with the person. A number of benefits

might be gained by using a shared osteoarthritis beliefs model. First, it could reduce some of the barriers to conservative treatment caused by contrasting or conflicting beliefs (Erwin et al., 2017b). Second, embedding an integrated collaborative care approach to clinical services could improve communication between patients and clinicians, and amongst clinicians (Erwin et al., 2017b, 2017a; Kingsbury & Conaghan, 2012). Third, a reduction in healthcare waste could occur due to decreases in treatment non-adherence due to the more cohesive service (Hunter, 2017).



**Figure 11.** Shared model of osteoarthritis beliefs.

#### **12.1.4.1 Key constructs of the model - Physical well-being**

Both groups of participants demonstrated that they held beliefs about physical well-being in the treatment of osteoarthritis. Furthermore, several participants referred to activities they, or their patients, felt that they could not or should not do, or would not be able to do in the future because of their condition. Given the importance of physical activity and exercise in the conservative treatment of osteoarthritis, the inclusion of a component of beliefs about physical well-being is essential (Fransen et al., 2015). Moreover, research suggests that it is typically the limitations of a person's activities of

daily living that cause them to seek treatment for their osteoarthritis (Mitchell et al., 2006).

#### **12.1.4.2 Key constructs of the model - Psychological well-being**

This thesis shows that clinicians and people with osteoarthritis believe that osteoarthritis can influence people's psychological well-being. There is extensive research that acknowledges the impact of osteoarthritis on people's emotions and psychological well-being (Brand et al., 2014, 2014; Elizabeth & Rena, 2011; Hawker et al., 2011; Sharma, Kudesia, Shi, & Gandhi, 2016; Smythe & White, 2017; Vaughan et al., 2017). In particular, Vaughan et al. (2017) identified an association between high levels of negative affect and participation restriction in people with chronic knee pain and knee osteoarthritis over time. The authors concluded that a more negative mood led to greater disability irrespective of objective measures of physical function (Vaughan et al., 2017).

#### **12.1.4.3 Key constructs of the model - Social well-being**

Many of the people with osteoarthritis who participated in this thesis referred to the association between osteoarthritis and beliefs about social well-being. Some made comment about osteoarthritis reducing their well-being, with references to people not participating in sport and missing out on social activities with friends and family, a finding that has been identified in previous research (Erwin et al., 2017b). However, participants with osteoarthritis also indicated that social support systems could help them cope with osteoarthritis. Furthermore, some of the clinicians who participated described the importance of acknowledging the social setting of the patient, such as tailoring the treatment approach to the person's situation.

#### **12.1.4.4 Key constructs of the model - Cultural well-being**

The association between culture and osteoarthritis was not overt from the thesis findings. However, a few of the clinicians who participated implied that '*our culture*' influenced how their patients coped with osteoarthritis. Blakely and Dew (2004), argue that it is challenging to appreciate the influence of culture on our health beliefs because we are immersed in it. People's culture and social environment guide the development of their health beliefs and expectations (Crum & Zuckerman, 2017). Helman (2007, p 19) states, '*The culture and background in which we grow up in teaches us how to perceive and interpret the many changes that can occur over time in our own bodies*'. Researchers suggested that culture can appreciably affect health beliefs and behaviours, both positively and negatively (Crum & Zuckerman, 2017; Helman, 2007). Some

academics argue that culture should not be restrictively defined by ethnicity, but more expansively as the manner in which people create and share explanations about their world, and how these shared understandings inform their actions (Helman, 2007; MacDonald, 1999). Using this broader definition, culture becomes a construct that can be applied to numerous contexts, it can represent the cultural environment of the person living with osteoarthritis and it can represent the culture of the health service or clinical environment.

#### ***12.1.4.5 Key constructs of the model - Collaborative communication***

Clear collaborative communication appears to be central to effective treatment, for both people with osteoarthritis and clinicians. Existing models of people's and clinicians' health, illness and treatment beliefs do not specifically refer to the role of communication and patient-clinician interaction in the context of the therapeutic relationship (Engel, 1977; Leventhal, Weinman, Leventhal, & Phillips, 2008). Research shows that effective patient-clinician communication can lead to better engagement and adherence to conservative treatment (Egerton et al., 2016; Geryk et al., 2016; Hunter, 2017). Additionally, research suggests that collaboration amongst clinicians is important for the effective treatment of people with osteoarthritis (Bain et al., 2012; Street Jr. et al., 2009).

## **12.2 Strengths and limitations of the thesis**

The thesis had two main strengths. First, the mixed-methods approach allowed for the strengths of each methodology to be drawn on so that the resulting insights became greater than those that could have been achieved with a single methodological approach. Additionally, the diversity of theoretical and philosophical perspectives led to a greater depth of understanding about osteoarthritis beliefs (Creswell & Plano Clark, 2011; McPherson & Kayes, 2012). Second, the collection of data from people living with hip and/or knee osteoarthritis and clinicians who treat the condition allowed a wider appreciation of the phenomena of interest. By collecting data from both groups, both sides of the story were presented in the thesis, which enabled comparisons to be made between the two sets of beliefs.

The thesis had five notable limitations. First, it appears that both of the surveys were too long. This factor may have contributed to the less than optimal return-rate of the paper survey and the high dropout rates of the two online surveys. Therefore, future survey

research would benefit from using shorter questionnaires. Second, the narrow ethnic diversity of the participants with osteoarthritis restricts the generalizability of the findings to the people other than New Zealand Europeans. Third, the adaptation of questionnaires designed for collecting data about clinicians' beliefs about low back pain may have reduced the usefulness and meaningfulness of some of the data collected, especially in light of the limitations of the PABS-PT. Fourth, clinicians' beliefs about osteoarthritis come from their acquired knowledge about the condition rather than their belief system. Therefore, the two studies of clinicians' beliefs may have inadvertently become studies of their osteoarthritis knowledge more than their beliefs about the condition. Fifth, the items that made up the people's Amended KOFBeQ and the Clinicians KOFBeQ subscales differed slightly, which may have influenced the findings from the two groups. Hence, the comparisons between these findings should be interpreted with some caution.

### **12.3 Recommendations for future research**

The findings from this thesis raised a number of new research questions. There are three areas in particular, that require further research. First, findings from this thesis showed considerable limitations in the current measures of clinicians' osteoarthritis beliefs. Hence, a new valid and reliable questionnaire that explores clinicians' osteoarthritis beliefs and knowledge is needed. This questionnaire could use the proposed shared osteoarthritis beliefs model (*Figure 10*) as a theoretical framework and should incorporate measures of the most commonly prescribed treatments.

The following method could be undertaken to develop a clinicians' hip and/or knee osteoarthritis beliefs and knowledge questionnaire. A qualitative study including clinicians who commonly manage hip and knee osteoarthritis could be undertaken to explore the utility of the proposed model and the importance and value of the five key constructs. If the findings from this study support the model and the associated constructs, a new questionnaire could be designed. The design of the questionnaire and the included items would be informed by the findings from the qualitative study, the shared osteoarthritis beliefs model and existing clinicians' health, illness and treatment beliefs questionnaires. The clinicians' osteoarthritis beliefs and knowledge questionnaire would be tested for face and content validity, and the feedback would be used to improve the questionnaire. Next, the questionnaire would be trialled with clinicians. Subsequently, the data would be subjected to explorative factor analysis to



establish if it fitted the five key constructs of the model. If the initial studies supported the model, future research could be undertaken to explore the validity and reliability of the questionnaire.

Second, findings from this thesis suggest limitations in the current measures of people's hip and/or knee osteoarthritis health, illness and treatment beliefs. A separate questionnaire to the clinicians' osteoarthritis beliefs and knowledge questionnaire would be needed because people living with the disease have a different point of view of osteoarthritis to the view held by clinicians who treat the condition. However, the questionnaire development could employ the same methods described above for the clinicians' questionnaire and could also be informed by the shared osteoarthritis beliefs model (*Figure 10*).

Third, future research should be conducted that explores the osteoarthritis health, illness and treatment beliefs of New Zealander's who come from ethnicities other than New Zealand European such as Maori, Pacifica and Asian. Consultation with appropriate stakeholders should be undertaken to ensure that the methods used are appropriate. Additionally, any study(s) would need to be conducted using methods that are culturally responsive, and included researchers and/research assistants who have the same or similar ethnicity as those people who are participating in the study.

## **12.4 Implications for clinical practice**

The findings from this thesis have three key implications for clinical practice. First, new and existing clinical services for people with hip and/or knee osteoarthritis should aim to deliver care in a manner that enables interprofessional collaboration and patient/person-centred practice. Better collaboration and communication amongst clinicians could lead to services that reduce duplication, improve the quality and consistency of advice and education given to patients, and are more holistic in nature. Furthermore, using a patient/person-centred approach can lead to greater levels of patient satisfaction and engagement (Lawford, Bennell, & Hinman, 2017). Nevertheless, it is not simple to implement this type of approach, as it would require changes to funding and organisation of the New Zealand health system and may require the development of an Osteoarthritis Model of Care (Briggs et al., 2016; Speerin et al., 2014).

Second, clinicians may overestimate their patients' functional ability and their patient's perceptions about osteoarthritis treatment efficacy. Hence, there may be merit in clinicians' taking more time to listen to their patients and accurately assess their everyday functional ability and knowledge of the disease and its treatment options. This would improve clinicians' understanding of the beliefs and knowledge of their patients and enable them to tailor education and treatment to the specific needs of each patient. Consequently, patients who are better informed about the known benefits of conservative treatment, may demonstrate higher levels of treatment adherence and improved treatment outcomes.

Third, there may be value in directing more clinical resources towards enabling people with hip and/or knee osteoarthritis to self-manage their condition and navigate the New Zealand health system. These resources could include the development of standardised clinical pathways, the implementation of treatment decision-making tools, or web-based tools that help patients to manage their symptoms (Briggs et al., 2016; Elwyn et al., 2016).

## **12.5 Novel contributions of the research**

Many findings came from the studies that made up this thesis, but there were five novel contributions that merit reiterating. One, the qualitative study of people's beliefs highlighted the importance that participants placed on the interactions they had with clinicians. It appears that effective communication between patients and clinicians can have a positive effect on the patients' sense of well being and poor communication can have a negative effect. Two, the qualitative study of clinicians' beliefs revealed that some clinicians see the treatment of osteoarthritis as boring and hence perceived as a mundane treatment because there is little they feel they can offer the patients. Three, the findings from the survey of people's osteoarthritis beliefs suggests there may be some merit in using the KOFBeQ, both with people with hip and knee osteoarthritis. However, Selten et al., (2017) have published a new patients' osteoarthritis treatment beliefs questionnaire that appears promising, and could be adapted for use with clinicians. Four, the findings from the survey of clinicians' osteoarthritis beliefs show that further work is needed to develop a suitable questionnaire for exploring the constructs of the biopsychosocial model, as the PABS-PT does not appear to be appropriate for use in the context of osteoarthritis. Five, the shared model of

osteoarthritis beliefs could become a framework for developing clinical services for people with osteoarthritis in New Zealand and internationally.

## **12.6 Conclusions**

The findings from the research components of this thesis have led to the following three conclusions. First, people with hip and/or knee osteoarthritis and clinicians who manage the condition hold both similar and conflicting beliefs about the disease. Moreover, these findings point to aspects of osteoarthritis care in New Zealand that need improvement. Principally, better guidance from clinicians with regard to the treatment and self-management, greater communication between clinicians and patients, and the employment of a holistic approach to treatment. Second, this thesis found limitations in the current questionnaires used to measure osteoarthritis health, illness and treatment beliefs held by people with hip and/or knee osteoarthritis. Limitations were also identified in the current questionnaires used to measure clinicians' osteoarthritis beliefs. Third, the health, illness and treatment beliefs of both people with hip and/or knee osteoarthritis and clinicians who treat the condition were not fully explained by existing health, illness and treatment beliefs models. The shared model of osteoarthritis beliefs is proposed as a novel theoretical framework. The model was informed by the findings of this thesis and existing health beliefs models, and may overcome the limitations of existing models.

The shared model of osteoarthritis beliefs should only be regarded as a proposition until it has been subjected to further research, but it could become a framework to guide the development of future healthcare services for people with the condition. Implementation of the proposed model could lead to reductions in the negative beliefs known to affect adherence to conservative treatment, enhance the delivery of patient-centred care for people with hip and/or knee osteoarthritis and facilitate genuine engagement and collaboration with clinicians. Ultimately these changes could enable best-practice treatment, increase patient satisfaction and improve the quality of life for people living with hip and/or knee osteoarthritis in New Zealand.

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## Appendices

## Appendix A - Demographic and disease characteristics questionnaire people's qualitative study

### Participant Screening Form

Please read the questions carefully and answer each one honestly, ticking the appropriate box or adding information if necessary. Your responses will of course be kept in the strictest confidence. This form must be completed, returned to the assessor with the consent form and WOMAC forms.

#### Participant Details

Name		Age		Gender: <input type="checkbox"/> M <input type="checkbox"/> F
Phone Number		Address		
Email		Highest Level of Qualification	<input type="checkbox"/> High School <input type="checkbox"/> Trade Certificate <input type="checkbox"/> Bachelor's Degree <input type="checkbox"/> Other	
Occupation				

#### Disease Details

How long ago you were diagnosed with osteoarthritis?	
Which of your joints are affected by osteoarthritis?	
Who have you consulted regarding the management of your osteoarthritis? (Please list all both medical and non-medical, such as massage therapist etc.)	
Have you had, or do you plan to have surgery as a result of your osteoarthritis?	

## Appendix B - Participant interview schedule people's qualitative study

### Participant Interview Schedule of Topics

**Introduction:** To be started at the start of each interview

Hi..... Thank you for agreeing to participate in this study and interview.

I would like to confirm you have read the participant information form and signed the consent form. You have already had an opportunity to ask me any questions regarding the study however, are there any further questions you would like to ask me about the study before we begin the interview? Please remember you do not have to answer all the questions, if you feel uncomfortable or do not wish to answer a question simply state, I would rather not answer that.

You can ask to stop the interview at any time.

### Questions and Cues

- 1) Tell me about living with osteoarthritis? (beliefs and experiences)
  - Pain
  - Activities of daily living
  - How do you see yourself
  - Changed over time
- 2) Tell me about a time recently that you had a good day for you in terms of your osteoarthritis?
- 3) How does this compare with a not so good day?
  - Mood/ motivation/ feelings
  - Functional ability
  - Affect just you or your family/ partner/ friends/ work colleagues?
- 4) What first motivated you to go to your doctor about your osteoarthritis??
  - What lead to the diagnosis
  - Health professionals involved
  - Health professionals you would like and expect to be involved
- 5) What advice would you give to someone who was newly diagnosed with osteoarthritis?
  - Things to know
  - Things to try
  - Pain relief
- 6) With regards to your osteoarthritis, what do you think the future holds for you?
  - get worse
  - management
  - lifestyle

?

### Closing Question

We have talked about a lot of things today, is there anything you think that is important that we have not talked about, or that you think I should know?

?



## Appendix C - Ethics committee approval people's qualitative study



# MEMORANDUM

## Auckland University of Technology Ethics Committee (AUTEC)

To: Sandra Bassett  
 From: Rosemary Godbold, Executive Secretary, AUTEC  
 Date: 18 June 2012  
 Subject: Ethics Application Number **12/101 New Zealand patients' beliefs and expectations regarding the management of their osteoarthritis.**

Dear Sandra

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 30 April 2012 and I have approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 9 July 2012.

Your ethics application is approved for a period of three years until 18 June 2015.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/research/research-ethics/ethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 18 June 2015;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/research/research-ethics/ethics>. This report is to be submitted either when the approval expires on 18 June 2015 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this.

To enable us to provide you with efficient service, we ask that you use the application number and study title in all written and verbal correspondence with us. Should you have any further enquiries regarding this matter, you are welcome to contact me by email at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz) or by telephone on 921 9999 at extension 6902. Alternatively you may contact your AUTEC Faculty Representative (a list with contact details may be found in the Ethics Knowledge Base at <http://www.aut.ac.nz/research/research-ethics/ethics>).

On behalf of AUTEC and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Dr Rosemary Godbold  
 Executive Secretary  
**Auckland University of Technology Ethics Committee**

Cc: Daniel O'Brien [dobrien@aut.ac.nz](mailto:dobrien@aut.ac.nz)



## Appendix D - Participant information sheet people's qualitative study

10 July 2017

page 1 of 3

# Participant Information Sheet



### Date Information Sheet Produced:

16/10/2013

### Project Title

New Zealand patients' beliefs and expectations regarding the management of their osteoarthritis.

### An Invitation

You are invited to take part in this study, but before you accept this invitation would you please read the following outline of the study. You will need to make a decision about taking part in this study prior to participating in the interview. Your participation is entirely voluntary (your choice). If you do agree to participate you can withdraw from the study at any time without giving a reason, and this will in no way affect your future health care. You do not have to take part in this study; there is no cost to participate in the study.

### What is the purpose of this research?

The aim of the project is to gain a better understanding of the beliefs and expectations held by New Zealand patients regarding the management of their OA. People with OA will be interviewed regarding their beliefs and expectation with give direct insight into these phenomena. The results of this study will also assist in the development of a questionnaire that will be used in a larger study to investigate the beliefs and expectations held by New Zealand patients regarding the management of OA.

This study will contribute to the proposed PhD study of the researcher. The findings may be used for both research presentations and publication, if this occurs all identifying details will be removed from the presented data.

### How was I identified and why am I being invited to participate in this research?

You have received this information form (and the attached consent form) as you responded to one of the advertisements promoting this study.

We are looking for twenty people over the age of 20 years who have been diagnosed with osteoarthritis in one or more joints, by their GP or other medical specialist (Rheumatologist, Orthopaedic Surgeon, etc.). To participate in the study you will need to have a good command of the English language, so that are able to express your beliefs and expectations effectively in the interview. People are unable to participate in the study if they have or are currently patients and/or students of the researcher (Daniel O'Brien).

### What will happen in this research?

If you express an interest in participating in the study you will be sent a copy of the participant information form (this document), a participant consent form (see attached) and a self-addressed envelope. If after reading the participant information form you wish to be a participant in the study, you will need to complete the consent form and return this to the

researcher. You will then be sent a quality of life and a participant demographic screening form. The screening form is to allow us to make sure we get a variety of people with different experiences of living with osteoarthritis. Once you complete these forms and return them to the researcher, you will be contacted within two weeks to arrange a time to conduct an interview. If we have too many people interested in participating the researcher will tell you. The interview will be an opportunity for the researcher to ask you about your beliefs and expectations of the management of your osteoarthritis. The time and location of this interview is up to you. The interview will take between 60 and 90 minutes and will be recorded for accuracy purposes. Once the interview has been completed the researcher will combine the notes and recorded interview into a cohesive story. This process will take approximately four weeks. When this is done the document will be sent to you for reviewing regarding its accuracy. You will then be asked to return the document with any suggested additions or changes.

#### **How will these discomforts and risks be alleviated?**

The only anticipated risk for participating in this study is that the interview process may lead you to discuss experiences, beliefs or expectations that are upsetting. Any person who participates in a study undertaken by or through AUT University is entitled to funded counselling session to assist in the management of any emotional trauma that may have been revisited during the process of participating in the study. The AUT Counselling services are located on AUT's North Shore campus and can be contacted on 921-9998.

#### **What are the benefits?**

There may be no benefits for you participating in this research. Sometimes, individuals enjoy having an opportunity to comment and feedback about their experiences with the hope that this will aid others in a similar situation. The information from the research is expected to contribute to the management of people living with osteoarthritis in the future.

#### **What compensation is available for injury or negligence?**

In the extremely unlikely event of a physical injury as a result of your participation in this study, rehabilitation and compensation for injury by accident may be available from the Accident Compensation Corporation, providing the incident details satisfy the requirements of the law and the Corporation's regulations.

As outlined above, any person who participates in a study undertaken by or through AUT University is entitled to funded counselling session to assist in the management of any emotional trauma that may have been revisited during the process of participating in the study.

#### **How will my privacy be protected?**

No material which could personally identify you will be used in any reports on this study. For the analysis of the interviews, each participant will be given a confidential coding, so as their information can be linked. After the analysis, the interview transcripts will be kept on an external hard drive in locked in a filing cabinet at the School of Physiotherapy, Auckland University of Technology for ten years. The consent forms for the study will be stored in a similar fashion but will be kept separate from the questionnaires.

#### **What are the costs of participating in this research?**

There are no monetary costs involved in taking part in this study. The only cost to you is the time it will take to complete the forms and be interviewed.

**What opportunity do I have to consider this invitation?**

Please take your time to consider this invitation and read this participant information form carefully, and remember you can withdraw at any stage. However, if you are interested in participating please return the attached consent form within one month of receiving this participant information form.

**How do I agree to participate in this research?**

Should you wish to participate in this study you simply need to complete the attached consent form and return it in the envelope provided. You should then receive the quality of life and screening questionnaire within two weeks.

**Will I receive feedback on the results of this research?**

A plain language summary of the study will be made available to participants who wish to have a copy at the end of the study. If you wish to have a copy of this summary please indicate this on the participant consent form.

**What do I do if I have concerns about this research?**

If you have any queries or concerns regarding your rights as a participant in this study, you may wish to contact an independent Health and Disability Advocate, telephone 0800 555 050 (Auckland region and north), or e-mail [advocacy@hdc.org.nz](mailto:advocacy@hdc.org.nz)

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Sandra Bassett who can be contacted at 09 921-9999 ext 7123 or by email at [sandra.bassett@aut.ac.nz](mailto:sandra.bassett@aut.ac.nz).

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEK, Dr Rosemary Godbold, [rosemary.godbold@aut.ac.nz](mailto:rosemary.godbold@aut.ac.nz), 921 9999 ext 6902.

**Whom do I contact for further information about this research?*****Researcher Contact Details:***

If you need more information you may contact **Daniel O'Brien**, who is the principal researcher and can be contacted at 09-9219999 ext 9160 or by email at [dobrien@aut.ac.nz](mailto:dobrien@aut.ac.nz).

***Project Supervisor Contact Details:***

Dr Sandra Bassett, is the project supervisor and can be contacted at 09 921-9999 ext 7123 or by email at [sandra.bassett@aut.ac.nz](mailto:sandra.bassett@aut.ac.nz).

**Approved by the Auckland University of Technology Ethics Committee on 18<sup>th</sup> June 2012 AUTEK Reference number 12/101.**

## Appendix E - Consent form people's qualitative study



### CONSENT FORM

Title of Project: New Zealand patients' beliefs and expectations regarding the management of their osteoarthritis

I have:

- Read and understood the participant information sheet dated 16/05/2012, for volunteers taking part in the study designed to investigate patient beliefs and expectations regarding the management of osteoarthritis in New Zealand.
- Had the opportunity to discuss this study with the student researcher and I am satisfied with the answers that I have been given.
- Had the opportunity to use whanau support or a friend to help me ask questions and understand the study.

I understand:

- That taking part in this study is voluntary (my choice), and that I may withdraw from the study at any time and this will in no way affect my future health care.
- That my participation in this study is confidential and that no material which could identify me will be used in any reports on this study.
- The compensation provisions for this study.

Also I:

- Have had time to consider whether to take part, and know to contact the researchers should I have any further questions.
- Know who to contact if I have any adverse effects from the study.
- Know that if I wish, I can receive a copy of the results of the study, but I do realise that there may be a delay between my participation in the study and publication of the results.
- I wish to receive a copy of a short report about the outcomes of this study YES/NO

I \_\_\_\_\_ (full name) hereby consent to take part in this study.

**Date:**

**Signature:**

**Researchers:** Dr Sandra Bassett, Dr Valerie Wright St-Clair and Daniel O'Brien

**Contact phone number for researchers:** Dr Sandra Bassett (09) 9219999 ext 7123, Daniel O'Brien 021 815 717.

**Project explained by:**

**Project role:**

**Signature:**

**Date:**

## Appendix F - Presuppositions Interview

**Present in the Interview:** Daniel O'Brien (DOB – Doctor Candidate), Valerie Wright St-Clair (VWST), and Sandra Bassett (SB)

**Date:** 9/05/2012

VWST: Why don't you start by talking to us about what you have done to be ready for this morning?

DOB: What have I done to get prepared for this morning? I have been quite conscious of trying to do nothing because I did not want to create prepared answers or anything like that. Yeah, I did nothing.

VWST: and obviously but thought through the technology and the pragmatics about having things ready to go

DOB: Yeah, I suppose have not thought about what I might be talking about. But I trialled the iPad as a recording device unsuccessfully and this recording device.

VWST: Well Daniel tell us about what draws you to do this study

DOB: There are probably three things, the first from a professional standpoint, I've been linked to osteoarthritis since before I came back to New Zealand through working in the NHS. I had patient after patient after patient with OA knee, and all I was being told by senior staff was "Put them on a bike". I thought there has got to be something more useful than that, a lot of the older patients didn't have access to gyms, cycles, so I started looking about, reading about literature in that area. Reading about what to do with these patients, I ended up doing a presentation in the hospital on whether excessive exercise would lead to osteoarthritis because there was still this sort of false idea out there that you were wearing your joints out. People were questioning why you would exercise if the joints were wearing out. That sort of changed my thought processes, I started thinking, "use it or lose it". Next, I came back to AUT, and I was working in a lower socioeconomic clinic for the University. Again I found I was seeing lots and lots of people with OA and many of them had co-morbidities. I got quite frustrated that they weren't being catered for. The left wing socialist in me kind of came out, so that led to me doing my masters in the area. I looked at how we could get these people more engaged in exercise. Why did I want to do the study in the way that I want to do? To use a mixed methods approach? I have read a bit of research using qualitative methods and have worked in an area where you use qualitative concepts all the time when you're assessing diagnosing and treating patients. So I realised that the combination of the two methods was quite exciting. The more I have got into mixed methods, the more I have realised that there are very few people in the university with much experience in mixed methodology. So long term that could be of benefit to me if I stay here the university.

VWST: So thinking about osteoarthritis what do you already know about what it is to live with osteoarthritis?

DOB: I see lots of people with it. I see lots of people who seem to be poorly managed in the sense that they haven't been given enough information. I have had patients come in post surgery and ask "could I have done these exercises before the operation?" I think yes, definitely. I have got arthritis in two or three of my joints, which is starting to catch up with me. So I think this changes my opinion of the disease from something that to something that you manage conservatively. Personally, I don't want surgery on my toe or my thumb or my finger. I don't want to be living on anti-inflammatories or similar pain medication. So if I don't want to do that, then surely there are many patients that have similar sorts of beliefs and understandings as I do.

VWST: So from...

DOB: I've gone off track there a bit.

VWST: No that's ... none of it's off track I guess it's all, it's all trying to bring into language, into words I think the things that we don't often talk about. It's just part of the journey of talking about things you necessarily have not thought much about before but just thinking about, so that people that you've seen what do you get a sense life might be like when you live every day with osteoarthritis?

DOB: Thinking about people I have spoken to in the last three or four weeks about it there is a sense of frustration. Frustration about not being able to do the things that you used to want to do, frustration about choice. A friend who had surgical debridement of his hip a couple of weeks ago on the right side said that the surgeon said "the other side is bugged. There is no point me doing that side". He said "well why don't you give it a go I am only 48, and I have got young kids. I want to be out playing football with them and doing rough and tumble with my son. If I have a hip joint replacement now at 48, I can't do that." He's quite worried about it, and he's frustrated that the surgeon's not prepared to try the smaller intervention to allow him the freedom to keep active with the kids. As he said, "worst case scenario, I'm going to end up with a joint replacement anyway. If this operation buys me three or four years, they could be an enjoyable three or four years with my teenaged son". Another fellow I spoke to recently probably reflects some other thoughts I have personally about my one joints. He is an ex-professional rugby player. He's a big Pacific Island guy, and he said to me that in his family history includes obesity and diabetes and heart disease. He said "I am trying to keep those things at bay, but now got my GP says don't exercise too much be careful of your knees. Exercise is what I've done for the last 20 years; it was my job, it's my life. Now I'm being told not to do it." He was frustrated in being told he had to stop. Plus it is actually against what the literature is saying he should be doing.

VWST: Well I was going to ask you how do you know the things that you know? Or how do you come to understand as you do

DOB: My masters looked at osteoarthritis management, and I did a lot of reading about the topic. Plus, with the preparatory work that I have done for the PhD, I have continued to read around clinical management and best practice guidelines. I've been reading the



best practice guidelines, and there is a bit of a push from a philosophical point of view to change the paradigm we treat osteoarthritis. Moving away from an intervention model, you know surgery and drugs etc., to a long-term approach to management, picking things up early. So we need the people in their late thirties who may be getting the odd joint niggles to start treatment. Because when you look at their signs and symptoms and history, they're probably going to end up with osteoarthritis. We need to be getting these people early and getting them into behaviour change programmes looking at their lifestyles. I suppose the other way that I feel that I know about it is clinical; we have a significant number of patients both in the clinic now and in previous clinics that I have worked in. People who come in with osteoarthritis as their main complaint. Also, in the last two years, I've been involved in the local community arthritis education evenings. Both as a presenter but also facilitating the programme. That allows me the opportunity to talk to a lot of patients, hear their stories and their experiences. We have tried to design the education evenings to provide information that covers the things they feel that don't know or want to know more about

VWSC: So how much do you think being a physiotherapist and how you come to be a physiotherapist or ways in thinking in physiotherapy, how much do you think that influences how you see things?

DOB: Hugely, I think probably the things in my life that lead up to me being a physio, having an interest in sports, biomechanics, science how things worked. These things have all influenced my decision. Physiotherapy is about movement, from my perspective, and movement seems to be the key thing that's needed in these people whether it's for functionally or changing pain. Keeping them motivated. Whether it's from a physical conditioning perspective. Whether it's strengthening, as that seems to be something these people are missing out and I think that's what physios do to a large extent. I don't think we're the only people that do it, but I think we have a leading role in guiding exercise. We are trained to have an understanding of movement and activity, but also of pathology which is something that is different from the personal trainers. I think we are different from the physicians because I think they have an understanding of the pathology, but not the same understanding of exercise that we do. I am quite biased about that, but I think physiotherapists have a great role to play in the management of this condition.

VWSC: You mentioned physicians from your perspective how do you see or think physicians understand people's lives with osteoarthritis?

DOB: I think it is hugely varied. I've had interesting conversations with a few physicians about it. I think the view I enjoy the most is the sports doctors who are very much, OA is a part of getting old it's a part of being injured, but it is not a disease as such. It is a condition that we need to manage and manage conservatively, and that is part of their philosophy. I have heard a surgeon say "well you physios just keep them entertained until they come to me to have surgery" and there are a few surgeons who have that belief. The concerning thing is that I have had patients say "I went to my GP, he took an x-ray, he looked at my x-ray and said that's not good, off to the surgeon for

you". He sent him to the surgeon, and the surgeon did the knee joint replacement. He said at no point in time did anyone offer him any other options. Based on the literature that I am reading currently, there appears to be more and more surgery going on, and it's driven by the gatekeeper, the GP. The GP thinks you've come in with this condition, and this is the management strategy. It is interesting, the friend of mine who is currently having his hips operated on is a cardiac specialist. He is saying "hang on I don't want this big intervention, let's try the least invasive thing and work up to it." He's saying "I need quality of life". It's interesting to get his point of view on it, he's not an orthopaedic orientated physician, but he has that same medical training. He was saying some of the things that I was hearing. Start with the simple thing and then we can get more invasive with treatment.

VWSC: So you suggested that the way sports physicians think about it is more attuned to how you think about it

DOB: Yep

VWSC: If that is comfortable, that sounds right, could that alignment of thinking and feeling of the comfort stop you looking openly at other ways of managing it effectively? It could it just be that those other ways just feel. It is not as good because it doesn't feel as right?

DOB: You mean for me the reaction to go straight to surgery?

VWSC: Yes

DOB: No I don't think so because I do think there is a place for surgery. There are numerous patients over the years that I've said, "I know you're not keen for surgery, but I think this is the best intervention for you now". Or if they are not quite that extreme, tried exercise but how about we use some painkillers to keep the pain under control so that you can keep moving. So I don't think I am anti some of those interventions. I think there is a very very good place for these interventions, but I suppose that I am anti them being used at the wrong time or on the wrong person. There is evidence coming from research in Otago that shows that not everybody is going to deteriorate in the same fashion. Not everybody is going to need an operation. A lot of people, probably about 65%, actually aren't going to deteriorate rapidly. For those that do, surgery is a very good option. Looking back at my personal family history, I am probably going to be having a knee joint replacement in my sixties. I won't have a problem with it. I think some people try and put it off excessively, to the detriment of their own health. I think they become so immobile that other problems kick in. So I don't think I am anti-surgery, but I get frustrated when it gets used as a first line option when it's a final option, in my view it is. I suppose in I align with the sports physicians because regardless of what they are doing, surgery is always their final option. Surgical intervention is the last thing you look at. However, if you're a surgeon, surgery is what you do. So if someone comes to them asking about the surgery, they say "yes I can do

it, based on your x-ray your appropriate". I suppose that's one of the things that I am interested in exploring.

VWSC: And how do you think, I guess it is a lot of thinking about, how do you think surgeons come to their way of thinking about what they do?

DOB: I think there is a socialisation process that goes on in any profession. Talking to friends who have been involved in orthopaedics and surgical training, the surgical culture is one of the strongest medical cultures around. Whether that's a good thing or a bad thing, I don't know. It feels like they are indoctrinated, forced into a way of thinking.

VWST: Enculturated

DOB: Yeah, into a way of thinking. I think that can be negative; I think that it can be positive. We all have our professional boundaries, and it is good to get an overlap between profession. Some professions overlap better and communicate better than others. I think there is a bias associated with any profession, in the sense that someone comes to me the first thing that I think about is exercise. That's because I am a physio, that's what I am trained to do. Someone goes to a surgeon, the first thing they think about is surgery. I think there are some progressive surgeons out there, who go say "I could do this operation but come back in three or four years' time when you can't do X, Y, and Z and in the mean time go and see the physio, go see Daniel or whatever. But there are a lot who will operate based on the x-ray. I can do something, do you want me to do it yes, no, great. That's probably influenced by who their supervisor was, what sort of beliefs they hold, possibly even the group of clinicians their surgical consultancy with.

VWSC: Or maybe some of their own experiences even?

DOB: well yeah,

VWSC: How much do you think health economics matter? I mean, does it come into your thinking? If you managed the person conservatively over a long time, it might cost this amount, compared with a much more expensive shorter term intervention like surgery. Does that come into the thinking at all? Or should it?

DOB: Yeah it does. Something I thought was very interesting that was a study done in Norway, it was conducted between 1980 and 2006 I think. It was a financial comparison of the number of surgical operations done. What they found was the number of total knee joint replacements done every year, about 2001, suddenly increased. They tripled in numbers of surgeries done in the space of about three years. The authors of the study argued there was no change in the social need for the surgery, but the economy got better, and they had elected a right wing government. The government was looking at health numbers. Surgeries done is an easy thing to count, and an excellent thing for a government to produce. I feel like we have seen this here in New Zealand. They don't talk about changing services because you can't count that, but I can add up how many

surgeries are done. We've done, we've done twice as many knee joint replacements, so we are doing better than the last government.

VWSC: Good health services equal shorter wait lists?

DOB: Yeah, and I think that sort of stuff is ironic. Very naïve and very frustrating, generally speaking, conservative management is cheaper. Some people don't end up needing surgery after completing exercise programmes. They did a five-year trial in Aussie, a number of individuals on the surgical list coped well and functioned well with exercises, and they didn't want surgery anymore. If you consider that a knee joint replacement costs about 20,00 dollars, and that cost does not include post-op management. Plus, there are surgical risks, post op complications, the risk of infections, all sorts of horrible things. You would have to provide conservative care for a long time to match the cost of that one intervention. Now we see conservative care improves lots of other aspects of health as well, so maybe we should be going down that route. The risk of going to the physio over the risk of surgery is entirely different. I have had one patient that when he had his total knee joint replacement, he ended up with a post op infection. They ended up washing it out; they ended up replacing it again, twice. He ended up having the leg fused. He nearly died twice, his heart stopped, in the four operations that he had. This fellow he wishes he had met me before all these things happened, maybe he would have done physio for six months, and that would have been the way forward. Surgery is costly and because it was a medical misadventure ACC's paid millions for this fellow's care. That money could have funded exercise classes for the next 25 years. So yes I do think I have a financial bias.

VWSC: So you've hinted at things already perhaps tells us about, or thing about a person who you believe is living well or doing well living with osteoarthritis and say about that person.

DOB: There is a fellow I talked about in the presentation I did a couple of weeks ago. I thought he was quite impressive because he came in, not because his knees hurt, but because they were weak. I don't see that often. He said, "yes they were a little bit niggly, but not particularly sore". He was having difficulty getting up and down stairs. He was very independent always been active all his life. His knees looked bad. He has significant muscular atrophy in the area, and he was reasonably weak, and it got to the point that this was affecting his function. He was slim, not excessively, obviously lived a very healthy life, active life. We sent him away for three or four weeks with a strengthening programme for his hips and his knees, and he came back saying that it was fantastic. He could now do some of the things he wanted to do. Arguably he is lucky because it is not particularly painful. But we do see that in a lot of people where the pain is not a huge issue. He's very independent very mobile, has always stayed mobile, has been quite proactive about managing it, he has sought our intervention and assistance and has done well with it. So for him, I don't think OA affects his life that drastically

VWSC: Ok what about someone who you think of as not living so well with osteoarthritis?

DOB: I think there are a couple of things, from a physical standpoint, there's...

VWSC: Yeah think of one. It's easier often to describe them.

DOB: She had a lot of other things going on in her life. She was in her early sixties and looking after her mum who is in her 80's. She'd been moved into accommodation that her sister had bought, which had stairs and was poorly designed. She worried for her mum regarding balance and falls. But she had started feeling that she wasn't coping. Ironically, she was still walking two hours every day. She was still working; she was still independent. She'd developed this fear of the falling or of her OA getting worse and not being able to look after her mum. She talked about having battles with weight; she was morbidly obese. She was living with mum and her sole-career. She was frustrated that the arthritis was starting to affect her ability to do her role, look after mum. To step back from her case and think about other people I have seen who are not coping. These people often describe OA impacting their lives in ways they didn't anticipate, and they're blaming arthritis as something they got and they didn't deserve it as opposed to this is just part of the ageing process. I am coping with it, and I'm changing my lifestyle.

VWSC: So you're suggesting it's more how you think about it, influences life with OA more than how it is?

DOB: Yeah, I think it's a huge part of it. There was a fascinating study done reasonably recently that looking at illness perception. It compared two groups that were functionally and diagnostically, so from an x-ray perspective, quite similar. They took the whole group and assessed them and then they split them based on their illness perception scores. Those who perceived that the illness was not bad and those that perceived their OA more negatively. They watched how these people progressed over. I think it was five years. They found that the groups that viewed their osteoarthritis more negatively, despite being functionally and radiologically the same as the other group, functionally deteriorated more over this time than the other group. Those participants who saw it as just part of getting old or something they had to work with, didn't deteriorate as much over five years. My gut feeling is how you cope with illness can make a big difference.

VWST: Is it suggesting or are you suggesting that there maybe, that there's something else going on that we don't understand? Something between the disease of the physical manifestation and the functional or how life is, there's something in between that's grey

DOB: Yeah, there's probably lots of things we don't understand. It's not a clear linear process. If your x-rays look like this, your function looks like this, and this is how you're going to progress. How the disease progression is influenced by genetics, but the way you engage in life is obviously important too. People who get on with it, seem to cope better. They say, "ok this is just part of my life, and I'm going to fit it in". They probably are a little more active; they probably keep a little bit fitter, they may be better

at controlling some of those other lifestyle factors, like diet and weight. So possibly that's why they cope better, why they do functionally better because they keep going.

VWSC: What if it's not that?

DOB: I suppose that's why I want to do the study. That's why I want to go and interview people. It was fascinating talking to my friend who is having the surgical repair of his hips, hearing him say that he wanted more choice and options and that he was prepared to undergo two operations on the off chance that it was going to make a difference long term. Give him that extra time with the kids. I hadn't even thought about it like that; I thought two operations was worse than one. I thought why don't you get that one and just get on with it, but I can completely understand his view.

VWSC: So, I guess one way to use the conversation that we've had this morning, is to look at ways as you go through your study is to be always be thinking of how am I not hearing things that might be there? How does the thinking or understanding that I already have influenced what I hear, versus staying open to things that might be that we don't have a sense of yet. I guess the qualitative part of your study assumes that you come into the study with the knowledge you've acquired. You're not a blank slate, and you can't pretend that. So the way for you would be to be always reflecting on how it is what I think I already know, how might that be closing down the things that I couldn't find out. Can I ask questions in a way that will open up that space that I don't know is there already, so that's the task as a researcher.

DOB: There is something that I have thought about that may be a barrier for me. I interview patients on a daily basis for my job, and I interview them in a certain way because I want to get a degree of information from them to enable me to plan my treatment. I need to frame my questions in a manner so that I can put the answers into my notes, and so that other physios can understand it. I am quite conscious that I have to be careful not to take my clinician role into the research. I have to, not be a blank slate, but also not be asking questions that result in the answers I expect to hear.

VWSC: And I think that's part of our job. That's part of reflecting as you go through that journey. Thinking about how is what I know or understand closing off other ideas. Asking questions is part of our role. The methodology you're choosing, says that you should be aware of how your thinking is coming into play. Always seeing that it will be in play, is part of that step. Asking yourself how can I give myself the potential to hear and see things I don't see already. So that's part of the journey, that's part of how you will use your pre-understanding on the journey, and that's part of our role as supervisors is to help you stay open and bring, have things in play rather than closed off.

DOB: Yeah, I am quite conscious that because I'm trying to take these interviews into a place where it helps me design and develop a questionnaire. I don't want to get too hooked up on what the questionnaire might look like. I don't want to put my blinkers on and go, ok this is what the questionnaire is looking like, these are the things that I've

picked up on, and they match what I think my questionnaire is going to look like, so let's run with those.

VWSC: It's a bit like, you know your kind of attuned to physicians who already think as you do, it is easy, and it's comfortable. That's part of what you do; it's part of looking and saying, "OK, how might this be different? What might I not be asking about? I guess that's part of your task, always to bring that lens to it, and ask questions of your questions.

DOB: I am quite conscious of this. When I start, because I am using a purposeful sampling, that I really try and pick people who, maybe I think, "You're going to be hard to interview", or "you're very different to where I'm coming from", or "I completely disagree with what you're saying, your wrong". I have to interview those people. I have met many people who I would like to interview already. I will approach them because I think they will say things that I may not expect. One of them is the friend who's had the surgery because I think to get his thoughts on some of these things would be fascinating. He's done a lot of thinking about it. Also, the ex-rugby player who came to me, it was great to hear him talking. He's only turning 40, and he brings a different cultural angle, as an ex-professional sportsman. He's working with a lot of young guys trying to get them to look after their injuries etc. I think he's going to have some interesting views, so hopefully, I can speak with him again. I am conscious that I have to be careful that I am not picking people whose ideas I like, as opposed to picking people who have a variety of ideas.

VWSC: Also, I guess it's one of the things that will maybe make the research conversations different is you'll be asking questions that maybe physiotherapists don't usually ask. Opening up the questioning will have people delve and think about things in a way that they haven't before. So it will be interesting just to be open to that and see how that is similar or different

DOB: I am quite looking forward to conducting an interview that doesn't have a particular clinical purpose or end point. When I assess a patient, I have 20 minutes to come up with an idea of what's going on, how I am going to manage it and what am I going to do. I am quite looking forward to these interviews because it doesn't matter where we go. I don't have to have that end product so to speak, and there isn't going to be responsibility on me to pull it all together at the end of that 20 minutes and say, "well this is what we're going to do with you".

VWSC: That's right, learning to be in a conversation as a researcher rather than the way you already know so well.

DOB: And not falling into that midway through the interview.

VWSC: Well that's why we are here, and if you do that's all part of the learning journey. My sense, when I was finishing off my PhD, was that I felt I was just beginning to be a good phenomenological interviewer. I am aware that we have talked about a lot of things, is there anything that you thought that I was going to ask you that I

didn't? I know you tried not to think about thinking this, but is there anything that you felt that we've missed or that I haven't asked?

DOB: I think the things you haven't asked I brought in any way because as much as I tried not to think about it, of course, I did.

VWSC: Confessions of a participant.

DOB: I consciously didn't think about it over the last week, but about two or three weeks ago I was thinking, "it will be interesting". I was interested in the questions you would ask because these are some of the skills that I'm going to try and develop with my interviews, so I think I was biased from that point of view, but not from a topic point of view.

VWSC: So did anything surprise you?

DOB: No, it was what I thought it was going to happen. I have done too many presentations on it lately to be completely separate from the topic. I have almost rote learned answers. Not intentionally but from questions, I was asked in the presentation I did last week. I tried to make that presentation personal. I talked about some of the problems I have had with my joints. Why I want to keep moving and keep exercising, so I had already thought about how OA influences me.

VWSC: It all lines up; it all says hey we assume that always already you come into a situation with your past before you.

DOB: I think that you're naive if you think that you don't

VWSC: Alright, anything else you want to add, or Sandra anything you want to add.

SB: No

DOB: No, I don't think so.



## Appendix G - People's Survey questionnaire and participant information sheet



### Participant Information

#### Date Information Sheet Produced:

20 May 2016

#### Project Title

What are patients' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

#### An Invitation

Thank you for considering the opportunity to participate in this survey. I (Daniel O'Brien) want to understand more about the beliefs that you have on the treatment of your hip and or knee osteoarthritis (OA). My survey includes questions about your beliefs on the causes of your OA, how you manage it, what you think works for you and what doesn't. The results will contribute to my PhD, but will also be used to inform health professionals and those that write health policy about what people living with OA, think about their OA and the associated treatment. Your participation is completely voluntary and you will neither be advantaged nor disadvantaged by participating in this survey. If you do choose to participate, you will be contributing to the first study of this type to be undertaken in New Zealand.

#### What is the purpose of this research?

This study is being undertaken to explore the beliefs held by New Zealanders, with hip and/or knee OA, on the treatment of their condition. The findings from the survey will be used to inform both journal publications and conference presentations. Furthermore, the findings may be used to help inform future education programmes for both healthcare professionals and people living with OA. Findings will be presented as group data, meaning that no individual will be identifiable from the results.

#### How was I identified and why am I being invited to participate in this research?

You are reading this participant information form because you have either clicked on the link to the survey titled 'What are patients' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?' Or you have requested a paper copy of the survey after seeing the study advertisement.

#### What will happen in this research?

If you are completing this survey online via Survey Monkey, once you finish reading this form and acknowledge that you wish to complete the survey, the website will offer you a number of questions to complete. Please complete all the questions. The majority of the survey consists of questions with tick-box answers. The survey takes between 25 and 30 minutes to complete. On completion you will be asked to submit the survey. On doing so the answers will be submitted to the researcher. The submitted answers will be anonymous, meaning the researcher will not know who it has come from.

If you are completing a paper copy of the survey, you will need to answer all the appropriate questions in the survey. On completion of the survey please place it in the stamped, self addressed envelope and put it in the mail. Please don't write a return address on the envelope, as the answers need to be anonymous. Your answers will then be added to the electronic data file once they are received.

**What are the discomforts and risks?**

There are no anticipated risks in completing this survey.

**What are the benefits?**

There will be no immediate benefit to you by participating in this survey. Though people often feel that by contributing to OA based research, they are providing information that will improve healthcare long term of other people living with OA.

This study is one of four that the doctoral candidate is completing as part of his studies towards the award of a Doctorate of Philosophy. Therefore the completion of this study will contribute to his completion of the qualification. Additionally, the information gained from this study will improve the researcher's understanding of OA treatment beliefs in New Zealand.

The knowledge gained from this study will be disseminated to health professionals, health researchers, community organisations (Arthritis New Zealand), and to people living with OA via publications, and conference and community presentations. A clearer understand of the patients' treatment beliefs may lead to better patient and clinician education programmes in the future.

**How will my privacy be protected?**

Regardless of whether the survey is complete online or in paper form, all collected information will be anonymous. There will be no way of knowing who has contributed to the survey and what their responses were. All data used in publication or presentations will be done so as aggregated scores, meaning that no one respondent's scores will be identifiable.

**What are the costs of participating in this research?**

There is no cost to participating in this research other than your time. It is anticipated that the survey will take between 25 and 30 minutes to complete.

**What opportunity do I have to consider this invitation?**

The survey link will be available online until between the 1st September and 13th October 2016. Paper form surveys will be accepted until the 13th October 2016.

**How do I agree to participate in this research?**

By completing and submitting this survey you are agreeing for your answers to be used in the study. All responses will be reported as group findings, so no individual's results will be identifiable.

**Will I receive feedback on the results of this research?**

As the survey is anonymous, people who complete will not be directly given feedback on the study. However, a summary of the findings will be made available in the Arthritis New Zealand Newsletter (Joint Support) on completion of the data analysis. The newsletter is freely available on the Arthritis New Zealand website ([arthritis.org.nz](http://arthritis.org.nz)).

**What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Sandra Bassett, [sbassett@aut.ac.nz](mailto:sbassett@aut.ac.nz), 09 921 9999 ext. 7123.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTC, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 921 9999 ext 6038.

**Whom do I contact for further information about this research?**

Please keep / print this Information Sheet for your future reference. You are also able to contact the research team as follows:

**Researcher Contact Details:**

Daniel O'Brien, [dobrien@aut.ac.nz](mailto:dobrien@aut.ac.nz), 09 921 9999 ext. 8707.

**Project Supervisor Contact Details:**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Sandra Bassett, [sbassett@aut.ac.nz](mailto:sbassett@aut.ac.nz), 09 921 9999 ext. 7123.

Approved by the Auckland University of Technology Ethics Committee on **29th June 2016**, AUTC Reference number **16/202**.

## Osteoarthritis Survey

Hello and welcome to this survey on your beliefs about the treatment of hip and knee joint osteoarthritis (OA) in New Zealand. The survey will probably take you between 20 and 30 minutes to complete (so please make sure you are comfortable).

The survey has three sections. Please complete all of section one and two, and only the part of section three that relates to you.

- The first (green) section contains general questions about you and your OA.
- The second (green) section contains questions on your beliefs about the treatment of OA in New Zealand.
- The third section includes questions about how your OA affects you. There are two parts in this section, one about the hip joint (blue) and one about the knee joint (orange). Please complete the part that relates to you (hip or knee). If you have both hip and knee joint OA, please decide which joint affects you the most and complete the appropriate section.

Thank you in advance for your participation.

## Section 1: Demographics and Disease Characteristics

Please tick or circle the answer that best describes you.

1.1 Age at last birthday in years:

- ☐ less than 30    ☐ 30 – 39    ☐ 40 – 49  
☐ 50 – 59    ☐ 60 – 69    ☐ 70 – 79    ☐ 80 +

1.2 Gender:

- ☐ Male    ☐ Female    ☐ Other

1.3 Highest level of education completed:

- ☐ None    ☐ Primary    ☐ Secondary  
☐ Tertiary (university or equivalent)

1.4 Please circle the word that best describes your current living status:

- (a) I live with:    living alone   /   with family   /   partner   /   spouse   /   friend etc.  
 (b) I live in:    Own home   /   flat   /   retirement village   /   care facility   /   hospital

1.5 Please indicate which ethnicity that best describes you:

- ☐ NZ European    ☐ Maori    ☐ Asian  
☐ Pacific Peoples    ☐ Indian    ☐ Middle Eastern / Latin American / African  
☐ Other

1.6 Please list the medications that you are currently taking for your osteoarthritis:

.....

.....

.....

1.7 Please list any dietary supplements that you are currently taking for your osteoarthritis:

.....

.....

.....

### General Characteristics

1.8 BMI

Height: ..... feet, inches      Height: ..... centimetres

Weight: ..... kgs

1.9 Physical Activity

Physical Activity is any activity that makes you breath hard, feel warm, and feel your heart beat faster. Examples of physical activity are walking, bicycling, dancing, house cleaning or gardening.

In a typical week how much time do you spend doing physical activity?

☐ None      ☐ About 30 minutes

☐ About 1 hour      ☐ About 2 hours      ☐ More than 2 hours

1.10 Smoking Status

Do you smoke?      ☐ Yes      ☐ No

**1.11 Other health problems: Has your doctor told you that you have any of the following?**

(Tick all that apply to you)

- ☐ Heart disease (for example angina, heart attack or heart failure)
- ☐ High blood pressure
- ☐ Problems caused by a stroke
- ☐ Leg pain when walking due to poor circulation
- ☐ Lung disease (for example asthma, chronic bronchitis or emphysema)
- ☐ Diabetes
- ☐ Kidney disease
- ☐ Diseases of the nervous system (for example Parkinson's disease or multiple sclerosis)
- ☐ Liver disease
- ☐ Cancer (within the last 5 years)
- ☐ Depression
- ☐ Arthritis in your back or other condition affecting your spine
- ☐ Rheumatoid arthritis or another kind of arthritis in addition to osteoarthritis

## Disease Characteristics

### Joint specific history

1.12 Which of your joints are affected by osteoarthritis?

☐ Hip: one side / both sides affected

☐ Knee: one side / both sides affected

☐ Spine

☐ Hands

☐ Other joints (please specify): .....

1.13 How long have you experienced the symptoms from osteoarthritis?

.....  
.....

1.14 Have you been diagnosed with osteoarthritis by your doctor?

☐ Yes

☐ No

If yes, how long ago were you diagnosed? .....

### Health professionals consulted

1.15 In the past year, which of the following health care providers have you seen for treatment of your hip and or knee osteoarthritis?

(Tick all that apply to you)

☐ Health educator / peer support group

☐ Dietician

(Continued on next page...)

- ☐ Physiotherapist
- ☐ General practitioner
- ☐ Rheumatologist
- ☐ Orthopaedic surgeon
- ☐ Alternative health practitioner
- ☐ Other (please specify): .....

---

### Surgical history

#### 1.16 Have you had surgery as a result of your osteoarthritis?

- ☐ Yes ☐ No

If yes, please indicate what you have had done.

.....  
.....

If no, do you anticipate that you will have surgery for your osteoarthritis?

- ☐ Yes ☐ No ☐ Don't know



## Section 2: OA Beliefs

### Your views about your OA

We are interested in your own personal view of how you now see your osteoarthritis.

Listed below are a number of symptoms that you may or may not have experienced since your osteoarthritis began. Please indicate by circling Yes or No, whether you have experienced any of these symptoms since your osteoarthritis began, and whether you believe that these symptoms are related to your osteoarthritis.

Symptoms	I have experienced this symptom since my osteoarthritis		This symptom is related to my osteoarthritis	
	Yes	No	Yes	No
Pain	Yes	No	Yes	No
Sore Throat	Yes	No	Yes	No
Nausea	Yes	No	Yes	No
Breathlessness	Yes	No	Yes	No
Weight Loss	Yes	No	Yes	No
Fatigue	Yes	No	Yes	No
Stiff Joints	Yes	No	Yes	No
Sore Eyes	Yes	No	Yes	No
Wheeziness	Yes	No	Yes	No
Headaches	Yes	No	Yes	No
Upset Stomach	Yes	No	Yes	No
Sleep Difficulties	Yes	No	Yes	No
Dizziness	Yes	No	Yes	No
Loss of Strength	Yes	No	Yes	No

Please indicate how much you agree or disagree with the following statements about your osteoarthritis by ticking the appropriate box.

	Views About Your Illness	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
IP1	My osteoarthritis will last a short time					
IP2	My osteoarthritis is likely to be permanent rather than temporary					
IP3	My osteoarthritis will last for a long time					
IP4	This osteoarthritis will pass quickly					
IP5	I expect to have this osteoarthritis for the rest of my life					
IP6	My osteoarthritis is a serious condition					
IP7	My osteoarthritis has major consequences on my life					
IP8	My osteoarthritis does not have much effect on my life					
IP9	My osteoarthritis strongly affects the way others see me					
IP10	My osteoarthritis has serious financial consequences					
IP11	My osteoarthritis causes difficulties to those who are close to me					
IP12	There is a lot which I can do to control my symptoms					
IP13	What I do can determine whether my osteoarthritis gets better or worse					
IP14	The course of my osteoarthritis depends on me					
IP15	Nothing I do will affect my osteoarthritis					
IP16	I have the power to influence my osteoarthritis					
IP17	My actions will have no affect on the outcome of my osteoarthritis					
IP18	My osteoarthritis will improve in time					
IP19	There is very little that can be done to improve my osteoarthritis					

Continued...

	<b>Views About Your Illness</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
IP20	My treatment will be effective in curing my osteoarthritis					
IP21	The negative effects of my osteoarthritis can be prevented (avoided) by my treatment					
IP22	My treatment can control my osteoarthritis					
IP23	There is nothing which can help my condition					
IP24	The symptoms of my condition are puzzling to me					
IP25	My osteoarthritis is a mystery to me					
IP26	I don't understand my osteoarthritis					
IP27	My osteoarthritis doesn't make any sense to me					
IP28	I have a clear picture or understanding of my condition					
IP29	The symptoms of my osteoarthritis change a great deal from day to day					
IP30	My symptoms come and go in cycles					
IP31	My OA is very unpredictable					
IP32	I go through cycles in which my osteoarthritis gets better and worse					
IP33	I get depressed when I think about my osteoarthritis					
IP34	When I think about my osteoarthritis I get upset					
IP35	My osteoarthritis makes me feel angry					
IP36	My osteoarthritis does not worry me					
IP37	Having this osteoarthritis makes me feel anxious					
IP38	My osteoarthritis makes me feel afraid					

### Causes of my Illness

We are interested in what you consider may have been the cause of your osteoarthritis. As people are very different, there is no correct answer for this question. We are more interested in your own views about the factors that caused your osteoarthritis rather than what others including doctors or family may have suggested to you. Below is a list of possible causes for your osteoarthritis. Please indicate how much you agree or disagree that they were causes for you by ticking the appropriate box.

	Causes	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
C1	Stress or worry					
C2	Hereditary – it runs in my family					
C3	A germ or virus					
C4	Diet or eating habits					
C5	Chance or bad luck					
C6	Poor medical care in my past					
C7	Pollution in the environment					
C8	My own behaviour					
C9	My mental attitude e.g. thinking about life negatively					
C10	Family problems or worries caused my illness					
C11	Overwork					
C12	My emotional state e.g. feeling down, lonely, anxious, empty					
C13	Aging					
C14	Alcohol					
C15	Smoking					
C16	Accident or injury					
C17	My personality					
C18	Altered immunity					

In the table below, please list in rank-order the three most important factors that you now believe caused **YOUR** osteoarthritis. You may use any of the items from the box above, or you may have additional ideas of your own.

The most important causes of my OA for me are:

1. ....
2. ....
3. ....

## Hip and knee osteoarthritis beliefs questionnaire

These are statements that other patients have expressed about their knee or hip osteoarthritis. For each statement, evaluate to what extent you agree or disagree with the statement.

1 = totally disagree    10 = totally agree

1. Old age is the main cause of knee and/or hip osteoarthritis.

1    2    3    4    5    6    7    8    9    10

*Totally disagree*

*Totally agree*

2. Knee and/or hip osteoarthritis is caused by cartilage wear.

1    2    3    4    5    6    7    8    9    10

*Totally disagree*

*Totally agree*

3. Traumas are the main cause of knee and/or hip osteoarthritis.

1    2    3    4    5    6    7    8    9    10

*Totally disagree*

*Totally agree*

4. Knee and/or hip osteoarthritis cannot be cured.

1    2    3    4    5    6    7    8    9    10

*Totally disagree*

*Totally agree*

5. Nothing can be done to modify the progression of knee and/or hip osteoarthritis.

1    2    3    4    5    6    7    8    9    10

*Totally disagree*

*Totally agree*

6. Knee and/or hip osteoarthritis is a fate for which not much can be done.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

7. Physical activities are harmful for knee and/or hip osteoarthritis.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

8. Wet weather makes knee and/or hip osteoarthritis worse.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

9. Some diets or food supplementations can prevent knee and/or hip osteoarthritis.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

10. Because of my knee and/or hip OA, I will soon be unable to walk any more.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

11. Because of my knee and/or hip OA, I will end up in a wheelchair.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

12. Because of my knee and/or hip OA, I will have to give up my leisure activities.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

13. Because of my knee and/or hip OA, I will have to stop sport activities.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

14. Because of my knee and/or hip OA, I will depend on others for activities of daily living.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

15. Because of my knee and/or hip OA, I will not be able to climb stairs anymore.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

16. Knee and/or hip injections can damage cartilage.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

17. Using a cane gives the image of very old age.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

18. Exercises are useless for knee and/or hip osteoarthritis.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

19. Medications are not helpful for knee and/or hip osteoarthritis.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

20. Surgery is inevitable when you have knee and/or hip osteoarthritis.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

21. Doctors and General practitioners (GPs) are not interested in knee and/or hip osteoarthritis.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

22. Having a doctor or GP who prescribes investigations (i.e. x-ray, MRI) for knee and/or hip osteoarthritis makes you feel more secure.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*

23. General practitioners usually do not refer patients with knee and/or hip osteoarthritis to specialists because osteoarthritis is a common and benign disease.

1 2 3 4 5 6 7 8 9 10

*Totally disagree*

*Totally agree*



24. Doctors and GPs underestimate pain in knee and/or hip osteoarthritis.

1	2	3	4	5	6	7	8	9	10
<i>Totally disagree</i>					<i>Totally agree</i>				

25. Doctors and GPs do not have much to propose for knee and/or hip osteoarthritis.

1	2	3	4	5	6	7	8	9	10
<i>Totally disagree</i>					<i>Totally agree</i>				

### Section 3: Disease Severity

#### Pain Scale (P4)

On average, how bad has your hip or knee pain (select the worst if both are affected) been...

In the *morning* over the past 2 days?

1 2 3 4 5 6 7 8 9 10

No pain

Pain as bad  
as it can be

In the *afternoon* over the past 2 days?

1 2 3 4 5 6 7 8 9 10

No pain

Pain as bad  
as it can be

In the *evening* over the past 2 days?

1 2 3 4 5 6 7 8 9 10

No pain

Pain as bad  
as it can be

With activity over the past 2 days?

1 2 3 4 5 6 7 8 9 10

No pain

Pain as bad  
as it can be

Please now complete *either* the hip (blue) or the knee (orange) section. If you have both hip and knee joint OA, please select the joint that most affects you and complete the related section.

## Hip Questionnaire

**Instructions:** This survey asks for your view about your hip. This information will help us keep track of how you feel about your hip and how well you are able to do your usual activities.

Answer every question by ticking the appropriate box, only **one** box for each question. If you are uncertain about how to answer a question, please give the best answer you can.

### Symptoms

These questions should be answered thinking of your symptoms and difficulties during the last week.

S1. Do you feel grinding, hear clicking or any other type of noise from your hip?

☐

Never

☐

Rarely

☐

Sometimes

☐

Often

☐

Always

S2. Difficulties spreading legs wide apart?

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

S3. Difficulties to stride out when walking?

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

### Stiffness

The following questions concern the amount of joint stiffness you have experienced during the **last week** in your hip. Stiffness is a sensation of restriction or slowness in the ease with which you move your hip joint.

S4. How severe is your hip joint stiffness after waking in the morning?

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

S5. How severe is your hip joint stiffness after sitting, lying or resting later in the day?

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

## Pain

P1. How often is your hip painful?

☐

Never

☐

Monthly

☐

Weekly

☐

Daily

☐

Always

What amount of hip pain have you experienced in the **last week** during the following activities?

P2. Straightening your hip fully.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

P3. Bending your hip fully.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

P4. Walking on a flat surface.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

P5. Going up or down stairs.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

P6. At night while in bed.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**P7. Sitting or lying.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**P8. Standing upright.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**P9. Walking on a hard surface (asphalt, concrete etc).**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**P10. Walking on an uneven surface.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**Function & Daily living**

The following questions concern your physical function. By this we mean your ability to move around and to look after yourself. For each of the following activities please indicate the degree of difficulty you have experienced in the **last week** due to your hip.

**A1. Descending stairs.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**A2. Ascending stairs.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**A3. Raising from sitting.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**A4. Standing.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**For each of the following activities please indicate the degree of difficulty you have experienced in the last week due to your hip.**

**A5. Bending to the floor/pick up an object.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**A6. Walking on a flat surface.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**A7. Getting in/out of the car.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

**A8. Going shopping.**☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A9. Putting on socks/stockings.



None



Mild



Moderate



Severe



Extreme

A10. Taking off socks/stockings.



None



Mild



Moderate



Severe



Extreme

A11. Raising from bed.



None



Mild



Moderate



Severe



Extreme

A12. Lying in bed (turning over, maintaining hip position).



None



Mild



Moderate



Severe



Extreme

A13. Getting in/out of bath.



None



Mild



Moderate



Severe



Extreme

A14. Sitting.



None



Mild



Moderate



Severe



Extreme

#### A15. Getting on/off toilet.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

#### A16. Heavy domestic duties (moving heavy boxes, scrubbing floors, etc).

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

#### A17. Light domestic duties (cooking, dusting, etc).

☐

None

☐

Mild

☐

Moderate

☐

Severe

Extreme

### Function, sports & recreational activities

The following questions concern your physical function when being active on a higher level. The questions should be answered thinking of what degree of difficulty you have experienced during the **last week** due to your hip.

#### SP1. Squatting.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

#### SP2. Running.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

#### SP3. Twisting/pivoting on load leg.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme



SP4. Walking on uneven surface.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

Quality of Life

Q1. How often are you aware of your hip problem?

☐

Never

☐

Monthly

☐

Weekly

☐

Daily

☐

Always

Q2. . Have you modified your life style to avoid activities potentially damaging to your hip?

☐

Not at all

☐

Mildly

☐

Moderately

☐

Severely

☐

Totally

Q3. How much are you troubled with lack of confidence in your hip?

☐

Not at all

☐

Mildly

☐

Moderately

☐

Severely

☐

Extremely

Q4. In general, how much difficulty do you have with your hip?

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

*Thank you for completing this survey. Please place this questionnaire in the included self adhesive envelope and post to AUT.*

## Knee Questionnaire

**Instructions:** This survey asks for your view about your knee. This information will help us keep track of how you feel about your knee and how well you are able to do your usual activities.

Answer every question by ticking the appropriate box, only **one** box for each question. If you are uncertain about how to answer a question, please give the best answer you can.

### Symptoms

These questions should be answered thinking of your knee symptoms and difficulties during the last week.

S1. Do you have swelling in your knee?

☐

Never

☐

Rarely

☐

Sometimes

☐

Often

☐

Always

S2. Do you feel grinding, hear clicking or any other type of noise when you knee moves?

☐

Never

☐

Rarely

☐

Sometimes

☐

Often

☐

Always

S3. Does your knee catch when moving?

☐

Never

☐

Rarely

☐

Sometimes

☐

Often

☐

Always

S4. Can you straighten your knee fully?

☐

Never

☐

Rarely

☐

Sometimes

☐

Often

☐

Always

S5. Can you bend your knee fully?

☐

Never

☐

Rarely

☐

Sometimes

☐

Often

☐

Always

Stiffness

The following questions concern the amount of joint stiffness you have experienced during the **last week** in your knee. Stiffness is a sensation of restriction or slowness in the ease with which you move your knee joint.

S6. How severe is your knee joint stiffness after first waking in the morning?

☐

☐

☐

☐

☐

None

Mild

Moderate

Severe

Extreme

S7. How severe is your knee stiffness after sitting, lying or resting later in the day?

☐

☐

☐

☐

☐

None

Mild

Moderate

Severe

Extreme

Pain

P1. How often do you experience knee pain?

☐

☐

☐

☐

☐

Never

Monthly

Weekly

Daily

Always

What amount of knee pain have you experienced in the **last week** during the following activities?

P2. Twisting/pivoting on your knee.

☐

☐

☐

☐

☐

None

Mild

Moderate

Severe

Extreme

P3. Straightening knee fully.

☐

☐

☐

☐

☐

None

Mild

Moderate

Severe

Extreme

P4. Bending knee fully.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

P5. Walking on flat surface.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

P6. Going up or down stairs.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

P7. At night while in bed.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

P8. Sitting or lying.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

P9. Standing upright.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

**Function & Daily living**

The following questions concern your physical function. By this we mean your ability to move around and to look after yourself. For each of the following activities please indicate the degree of difficulty you have experienced in the **last week** due to your knee.

**A1. Descending stairs.**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

**A2. Ascending stairs.**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

For each of the following activities please indicate the degree of difficulty you have experienced in the last week due to your knee.

**A3. Raising from sitting.**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

**A4. Standing.**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

**A5. Bending to the floor/pick up an object.**

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

A6. Walking on a flat surface.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A7. Getting in/out of the car.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A8. Going shopping.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A9. Putting on socks/stockings.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A10. Taking off socks/stockings.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A11. Raising from bed.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A12. Lying in bed (turning over, maintaining knee position).

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A13. Getting in/out of bath.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A14. Sitting.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A15. Getting on/off toilet.

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A16. Heavy domestic duties (moving heavy boxes, scrubbing floors, etc).

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

A17. Light domestic duties (cooking, dusting, etc).

☐

None

☐

Mild

☐

Moderate

☐

Severe

☐

Extreme

Function, sports & recreational activities

The following questions concern your physical function when being active on a higher level. The questions should be answered thinking of what degree of difficulty you have experienced during the **last week** due to your knee.

SP1. Squatting.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

SP2. Running.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

SP3. Jumping.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

SP4. Twisting/pivoting on your injured knee.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

SP5. Kneeling.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

Quality of Life

Q1. How often are you aware of your knee problem?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	Monthly	Weekly	Daily	Always



Q2. Have you modified your life style to avoid activities potentially damaging to your knee?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not at all	Mildly	Moderately	Severely	Totally

Q3. How much are you troubled with lack of confidence in your knee?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not at all	Mildly	Moderately	Severely	Extremely

Q4. In general, how much difficulty do you have with your knee?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None	Mild	Moderate	Severe	Extreme

*Thank you for completing this survey. Please place this questionnaire in the included self adhesive envelope and post to AUT.*

## Appendix H - Ethics confirmation people's survey



### AUTEC Secretariat

Auckland University of Technology  
D-88, WU406 Level 4 WU Building City Campus  
T: +64 9 921 9999 ext. 8316  
E: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)  
[www.aut.ac.nz/researchethics](http://www.aut.ac.nz/researchethics)

**AUT**

28 June 2016

Sandra Bassett  
Faculty of Health and Environmental Sciences

Dear Sandra

Re Ethics Application: **16/202 What are patients' beliefs about the treatment of hip and knee osteoarthritis in New Zealand.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 28 June 2019.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 28 June 2019;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 28 June 2019 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this. If your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply there.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz).

All the very best with your research,

Kate O'Connor  
Executive Secretary  
**Auckland University of Technology Ethics Committee**

Cc: Sandra Bassett Daniel O'Brien,

## Appendix I - People's survey advert

Do you have osteoarthritis (OA) of your hip or knee? If so, we want to hear from you.

The logo for AUT (Auckland University of Technology) is displayed in white, bold, sans-serif capital letters within a black rectangular box.

Osteoarthritis (OA) is a common condition affecting thousands of New Zealanders.

We are currently undertaking a survey to understand what people in New Zealand believe about the treatment of their hip and or knee OA. The survey is part of the lead researcher's PhD and the first of its kind in New Zealand.

It is hoped that the findings from the survey will contribute to future development of health services for people with OA.

To participate in the study you must be over 18 years of age, have been told by your doctor that you have hip and or knee OA, and currently reside in New Zealand.

For more information and to contribute to this study please go to <https://www.surveymonkey.com/r/OAbeliefsNZ> or contact Arthritis New Zealand on 0800 663 463.

## Appendix J - Clinicians' qualitative study demographic and occupational characteristics form

### Participant Demographic and Occupational History Form

Please read the questions carefully and answer each one honestly, ticking the appropriate box or adding information if necessary. Your responses will of course be kept in the strictest confidence. This form must be completed, returned to the assessor with the consent form.

#### Participant Details

<b>Name</b>		<b>Age / Gender</b>	
<b>Phone Number</b>		<b>Email</b>	
<b>Occupation</b>		<b>Year first qualified</b>	
<b>Post graduate / specialist qualifications</b>		<b>Location of pre registration qualification?</b>	

#### Professional Details

How long have you worked in a clinical role that involved the management of osteoarthritis?	
Was this a senior or junior role in the services?	
During this time were you working in a publicly (i.e. DHB) or privately funded service (private practice) or both .	
What were the criteria that you would use to decide that a person had OA of one joint or another?	
What factors influence how you would chose to manage a patient with OA?	
How reguallarly would treat people with OA?	<b>Every day / Most days / Once a week / Once per month (please circle one)</b>
Would you refer patients with OA on to other health practioners? If yes who?	
What advice would you usually give a peron whom you had diagnosed with OA?	
Do you think your profession has a role to play in the management of OA? Why/why not?	

## Appendix K - Participant Interview Schedule of Topics (Clinicians)

**Introduction:** To be started at the start of each interview

Hi ..... , thank you for agreeing to participate in this study and interview.

I would like to confirm you have read the participant information form and signed the consent form. You have already had an opportunity to ask me any questions regarding the study however, are there any further questions you would like to ask me about the study before we begin the interview? Please remember you do not have to answer all the questions, if you feel uncomfortable or do not wish to answer a question simply state, 'I would rather not answer that.

You can ask to stop the interview at any time.

### Questions and Cues

- 1) *How regularly do you work with / treat / manage people / patients with OA?*
- 2) *Have you had specific cases during your time as a clinician that have influenced / coloured / affected / changed the way you treat / manage your patients with OA?*
- 3) *Tell me about a time recently that you were treating a patient with OA?*
  - *Did you feel there was much that you can offer?*
  - *What things did you do? Say?*
- 4) *Are there things that affect how you manage or treat these people (physical or perceived barriers)?*
  - Funding
  - Age
  - Gender
  - Weight
  - Motivation
  - Ethnicity
- 5) *Do you have a clinic (service) policy on the management of OA?*
- 6) *What are your thoughts on the clinical utility of management guidelines? Do you find them useful or a hindrance?*
- 7) *Is the management of OA covered in any continued professional development programmes available to you?*
- 8) *What are the key pieces of advice and/or education that you would usually give to someone who was newly diagnosed with osteoarthritis?*
  - Things to know
  - Things to try
  - Pain relief
- 9) *With regards to your osteoarthritis, what do you think the future holds for these patients?*
  - get worse
  - management
- 10) *Do you find your patients with OA are challenging to manage / treat?*
- 11) *Do you often refer these people to other health professionals? If so who and why?*
- 12) *Do you think it is up to you as the health professional or the patient to manage their OA?*
- 13) *Do you have OA yourself or are you worried that you may develop the condition as you get older?*

**Closing Question**

We have talked about a lot of things today, is there anything you think that is important that we have not talked about, or that you think I should know?

## Appendix L - Ethics confirmation clinicians' qualitative study



AUTEC  
SECRETARIAT

12 May 2014

Sandra Bassett  
Faculty of Health and Environmental Sciences

Dear Sandra

Re Ethics Application: **14/62 New Zealand clinicians' beliefs and expectations about the management of osteoarthritis in New Zealand.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 5 May 2017.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 5 May 2017;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 5 May 2017 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz).

All the very best with your research,

Kate O'Connor  
Executive Secretary  
Auckland University of Technology Ethics Committee

Cc: Daniel O'Brien [dobrien@aut.ac.nz](mailto:dobrien@aut.ac.nz)

A u c k l a n d   U n i v e r s i t y   o f   T e c h n o l o g y   E t h i c s   C o m m i t t e e

WA505F Level 5 WA Building City Campus

Private Bag 92006 Auckland 1142 Ph: +64-9-921-9999 ext 8316 email [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)

## Appendix M - Clinicians' qualitative study participant information form

# Participant Information Sheet



### Date Information Sheet Produced:

12/04/2014

### Project Title

New Zealand clinicians' beliefs and expectations regarding the management of osteoarthritis

### An Invitation

You are invited to take part in this study, but before you accept this invitation would you please read the following outline of the study. This study and the subsequent findings will form the second section of my (Daniel O'Brien) PhD thesis and will inform my future PhD studies. I am currently a lecturer in the department of Physiotherapy at Auckland University of Technology and a registered physiotherapist. You will need to make a decision about taking part in this study prior to participating in the interview. Your participation is entirely voluntary (your choice). If you do agree to participate you can withdraw from the study at any time without giving a reason, and this will in no way affect you in the future. You do not have to take part in this study; there is no monetary cost associated with participating in the study.

### What is the purpose of this research?

The aim of this study is to gain a better understanding of the beliefs and expectations held by New Zealand clinicians regarding the management of OA. Clinicians who regularly treat people with OA will be interviewed regarding their beliefs and expectations. The results of this study will also assist in the development of a questionnaire that will be used in a larger study to investigate the beliefs and expectations held by New Zealand clinicians regarding the management of OA.

This study will contribute to the proposed PhD study of the student researcher. The findings may be used for both research presentations and publication, if this occurs all identifying details will be removed from the presented data.

### How was I identified and why am I being invited to participate in this research?

You have received this information form (and the attached consent and demographic form) as you responded to one of the advertisements promoting this study or were approached because of your experience in the area of the treatment of osteoarthritis. We are looking for between 12 and 16 people over the age of 20 years who are New Zealand registered healthcare professionals. To participate in the study you will need to have worked in a role in the past 12 months that meant you regularly treated people with OA (on average a minimum of one patient per month), and have a good command of the English language, so that you are able to express your beliefs and expectations effectively in the interview. People are unable to participate in the study if they have or are currently students of the researcher (Daniel O'Brien).

### What will happen in this research?

If you express an interest in participating in the study you will be sent a copy of the participant information form (this document), a participant consent form (see attached) and a self-addressed envelope or a reply email for electronic forms. If after reading the participant information form you wish to be a participant in the study, you will need to complete the consent form and demographic form, and return this to the researcher. The demographic form is to allow us to make sure we get a variety of



people with different experiences of treating people with osteoarthritis. Once you complete these forms and return them to the researcher, you will be contacted within two weeks to arrange a time to conduct an interview.

If we have too many people interested in participating the researcher will tell you. The interview will be an opportunity for the researcher to ask you about your beliefs and expectations of the management of your osteoarthritis. The time and location of this interview is up to you. The interview will take between 20 and 40 minutes and will be digitally recorded for accuracy purposes. Once the interview has been completed the researcher will transcribe the interview.

#### **What are the discomforts and risks?**

The only potential risk from participating in this study is that the interview process may lead you to discuss experiences, beliefs or expectations that you feel uncomfortable. However, it is not the purpose of the researcher or the study to challenge or critique your beliefs or expectations regarding the management of osteoarthritis.

#### **How will these discomforts and risks be alleviated?**

The researcher will clarify the purpose of the research at the start of the interview and allow for the interview to be finished at any stage. Furthermore, as a participant you have the right to choose to not answer any questions in the interview.

#### **What are the benefits?**

There may be no direct benefits for you participating in this research. Sometimes, individuals enjoy having an opportunity to comment and feedback about their experiences with the hope that this will aid others in a similar situation or assist in the development of better practices. The information from the research is expected to contribute to the management of people living with osteoarthritis in the future. Furthermore, this study will form a component of the student researcher's PhD thesis.

#### **What compensation is available for injury or negligence?**

In the unlikely event of a physical injury as a result of your participation in this study, rehabilitation and compensation for injury by accident may be available from the Accident Compensation Corporation, providing the incident details satisfy the requirements of the law and the Corporation's regulations.

#### **How will my privacy be protected?**

No material that could personally identify you will be used in any reports on this study. For the analysis of the interviews, each participant will be given a confidential coding, so that the information can be linked. After the analysis, the interview transcripts will be kept on an external hard drive in locked in a filing cabinet at the School of Physiotherapy, Auckland University of Technology for six years. The consent forms for the study will be stored in a similar fashion but will be kept separate from the questionnaires. Furthermore, any publication or presentation of the findings of this study will be completed in a manner that maintains the confidentiality of all participants.

#### **What are the costs of participating in this research?**

There are no monetary costs involved in taking part in this study. The only cost to you is the time it will take to complete the forms and be interviewed. You will however be re-reimbursed to cover loss of income for the time you spending in the interview. The imbursement will be at your standard hourly rate to a maximum of \$100 (incl. GST). You will need to provide an invoice for your time.

#### **What opportunity do I have to consider this invitation?**

Please take your time to consider this invitation and read this participant information form carefully, and remember you can withdraw at any stage. However, if you are interested in participating please return the attached consent form within one month of receiving this participant information form.

**How do I agree to participate in this research?**

Should you wish to participate in this study you simply need to complete the attached consent form and demographic form and return it in the envelope provided. Conversely if you have received this information electronically, please complete the forms and return via email to [dobrien@aut.ac.nz](mailto:dobrien@aut.ac.nz). The researcher will then contact you within two weeks.

**Will I receive feedback on the results of this research?**

A plain language summary of the study will be made available to participants who wish to have a copy at the end of the study. If you wish to have a copy of this summary please indicate this on the participant consent form.

**What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Sandra Bassett, [sandra.bassett@aut.ac.nz](mailto:sandra.bassett@aut.ac.nz) and Ph. 09 921-9999 ext. 7123

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTC, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 921 9999 ext 6038.

**Whom do I contact for further information about this research?*****Researcher Contact Details:***

If you need more information you may contact **Daniel O'Brien**, who is the principal researcher and can be contacted at 09-9219999 ext. 8707 or by email at [dobrien@aut.ac.nz](mailto:dobrien@aut.ac.nz).

***Project Supervisor Contact Details:***

Project Supervisor, Dr Sandra Bassett who can be contacted at 09 921-9999 ext. 7123 or by email at [sandra.bassett@aut.ac.nz](mailto:sandra.bassett@aut.ac.nz).

Approved by the Auckland University of Technology Ethics Committee on 12 May 2014, AUTC Reference number **14/62**.

## Appendix N - Clinicians' qualitative study consent form



### CONSENT FORM

Title of Project: New Zealand clinicians' beliefs and expectations regarding the management of their osteoarthritis

I have:

- Read and understood the participant information sheet dated 12/04/2014, for volunteers taking part in the study designed to investigate patient beliefs and expectations regarding the management of osteoarthritis in New Zealand.
- Had the opportunity to discuss this study with the student researcher and I am satisfied with the answers that I have been given.
- Had the opportunity to use whanau support or a friend to help me ask questions and understand the study.

I understand:

- That taking part in this study is voluntary (my choice), and that I may withdraw from the study at any time and this will in no way affect my future health care.
- That my participation in this study is confidential and that no material which could identify me will be used in any reports on this study.
- The compensation provisions for this study.

Also I:

- Have had time to consider whether to take part, and know to contact the researchers should I have any further questions.
- Know who to contact if I have any adverse effects from the study.
- *Know that if I wish, I can receive a copy of the results of the study, but I do realise that there may be a delay between my participation in the study and publication of the results.*
- *I wish to receive a copy of a short report about the outcomes of this study*  
YES/NO

I \_\_\_\_\_ (full name) hereby  
consent to take part in this study.

**Date:**

**Signature:**

**Researchers:** Dr Sandra Bassett, Associate Prof. Valerie Wright St-Clair, Prof. Richard Siegert and Daniel O'Brien

**Contact phone number for researchers:** Dr Sandra Bassett (09) 9219999 ext 7123, Daniel O'Brien 021 815 717.


**Project explained by:**

**Project role:**

**Signature:**

**Date:**

## Appendix O - Clinicians' survey questionnaire and participant information form

	<b>What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?</b>
<b>Introduction</b>	
<b>Hello and welcome to this survey on your beliefs about the treatment of hip and knee joint osteoarthritis (OA) in New Zealand.</b>	
<b>Thank you in advance for your participation.</b>	
<b>Daniel</b>	



What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

## Participant Information

### An Invitation

Thank you for considering the opportunity to participate in this survey. My name is Daniel O'Brien and I am conducting a study to explore the beliefs that you have on the treatment of your patients with hip and or knee osteoarthritis (OA). My survey includes questions about your beliefs about the causes of OA, how you manage it, what you think works and what doesn't. The results will contribute to my PhD. Additionally, the results will be used to inform healthcare professionals and the people who influence health policy. Your participation is completely voluntary and you will neither be advantaged nor disadvantaged by participating in this survey. If you do choose to participate, you will be contributing to the first study of this type to be undertaken in New Zealand.

### What is the purpose of this research?

This study is being undertaken to explore the beliefs held by New Zealand registered GPs and physiotherapists about the treatment of people with hip and/or knee OA. The findings from the survey will be used in both journal publications and conference presentations. Furthermore, the findings may be used to inform future education programmes for both healthcare professionals and people living with OA.

### How was I identified and why am I being invited to participate in this research?

You are reading this participant information form because you have clicked on the link to the survey titled 'What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?'.

### What will happen in this research?

Once you finish reading this form and click the 'next' button, the website will offer you a number of questions to complete. Please complete all the questions. The majority of the survey consists of questions with tick-box answers. The survey takes between 15 and 20 minutes to complete. On completion you will be asked to submit the survey. On doing so, the answers will be submitted to me. The submitted answers will be anonymous, meaning the I will not know who they have come from. On completion of the survey you will be offered the opportunity to enter a prize draw for one of two 'Fitbit Blaze' smart watches, each valued at \$365. To enter, all you need to do is enter your email address in the space indicated. Your email address will not be connected to your survey answers in any way. Therefore there will be no way of knowing what you wrote in the survey.

### What are the discomforts and risks?

There are no anticipated risks in completing this survey.

What are the benefits?

There will be no immediate benefit to you, beyond assisting in this research. However, you may feel that by contributing to the research that you are potentially providing information that will inform practise, and may improve healthcare long term for people living with OA.

This study is one of four that I am completing as part of my studies towards the award of a Doctorate of Philosophy. Therefore the completion of this study will contribute to my completion of the qualification. Additionally, the information gained from this study will improve the my understanding of OA treatment beliefs in New Zealand.

The knowledge gained from this study will be disseminated to health professionals, health researchers, community organisations (Arthritis New Zealand), and to people living with OA via publications, and conference and community presentations.



What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

#### Participant information

**How will my privacy be protected?**

All collected information will be anonymous. There will be no way of knowing who has contributed to the survey and what their responses were. All data used in publication or presentations will be done so as aggregated scores, meaning that no one respondent's scores will be identifiable.

**What are the costs of participating in this research?**

There is no cost to participating in this research other than your time. It is anticipated that the survey will take between 15 and 20 minutes to complete.

**What opportunity do I have to consider this invitation?**

The survey link will be available online until between the 1st September and 13th December 2016.

**How do I agree to participate in this research?**

By completing and submitting this survey you are agreeing for your answers to be used in the study. All responses will be reported as group findings, so no individual's results will be identifiable.

**Will I receive feedback on the results of this research?**

As the survey is anonymous, people who complete will not be directly given feedback on the study. However, a summary of the findings will be made available in the Arthritis New Zealand Newsletter ('Joint Support') on completion of the data analysis. The newsletter is freely available on the Arthritis New Zealand website ([arthritis.org.nz](http://arthritis.org.nz)). Additionally, the summary will be made available on the Physiotherapy New Zealand website.

**What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Sandra Bassett, [sbassett@aut.ac.nz](mailto:sbassett@aut.ac.nz), 09 921 9999 ext. 7123.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTECH, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 921 9999 ext 6038.

**Whom do I contact for further information about this research?**

Please keep / print this Information Sheet and for your future reference. You are also able to contact the research team as follows:

**Researcher Contact Details:**

**Daniel O'Brien, [dobrien@aut.ac.nz](mailto:dobrien@aut.ac.nz), 09 921 9999 ext. 8707.**

**Approved by the Auckland University of Technology Ethics Committee on type the date final ethics approval was granted, AUTC Reference 16/284.**





What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

#### Inclusion criteria

We are looking for New Zealand registered GPs or physiotherapists, who are over 18 years of age, a have treated a person with hip and/or knee OA in the previous six months, and currently live in New Zealand.

If you meet these criteria, please select the next button below.

If not, thank you for time. You can exit the survey by deleting the web address from your web-browser.

**AUT**

What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

#### Demographic and Occupational History

**Please read the questions carefully and answer each one by ticking the appropriate box or adding information where necessary.**

\* 1. What is your occupation?

- ☐ General Practitioner (GP)
- ☐ Physiotherapist

\* 2. What is your gender?

- ☐ Male
- ☐ Female

\* 3. How long have you been practising as a GP or physiotherapist?

- ☐ Less than 5 years
- ☐ Between 6 and 10 years
- ☐ Between 11 and 15 years
- ☐ Between 16 and 20 years
- ☐ Greater than 20 years

\* 4. Have you completed post-graduate or specialist qualifications in the area of musculoskeletal care?

- ☐ Yes
- ☐ No

\* 5. Where did you complete your pre-registration qualification?

- ☐ In New Zealand
- ☐ Elsewhere

\* 6. Do you work in a city, town or rural setting?

- ☐ City
- ☐ Town
- ☐ Rural

\* 7. Do you work in a publically or privately funded clinic?

- ☐ Public (i.e. DHB or hospital)
- ☐ Private (i.e. private practice)
- ☐ Both
- ☐ Other (please specify)

\* 8. What are the criteria that you typically use to decide that a person has OA of the hip and/or knee joint?

(Tick all those that apply).

- ☐ Patients' description of history
- ☐ Subjective symptoms
- ☐ Objective signs
- ☐ Imaging results (i.e. x-ray, MRI)
- ☐ All of the above
- ☐ Other (please specify)

\* 9. Which of the diagnostic criteria mentioned above (in question 10) do you believe is the **most** useful for making the clinical diagnosis of hip or knee joint OA?

\* 10. In your current job, how many patients do you see in your clinic / department with hip or knee OA?

- ☐ 1 or more patients per day
- ☐ 1 to 3 patients per week
- ☐ 1 to 3 patients per month
- ☐ 1 to 3 patients in the past six months

\* 11. Do you refer patients with OA on to other health practitioners? If yes, who?

- ☐ I don't typically refer these patients to other health care professionals
- ☐ Dietitian
- ☐ General Practitioner
- ☐ Green Prescription
- ☐ Occupational Therapist
- ☐ Orthopaedic Surgeon
- ☐ Orthotist
- ☐ Pain Service
- ☐ Personal Trainer (or similar)
- ☐ Physiotherapist
- ☐ Practice Nurse
- ☐ Psychologist
- ☐ Radiographer / Sonographer
- ☐ Other (please specify)

\* 12. What is the most important piece of advice you usually give a patient, after you have diagnosed them with OA?

13. Do you have or have you ever had hip and or knee OA yourself?

- ☐ Yes
- ☐ No

AUT

What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

OA Beliefs Questionnaire (Part One)

\* 14. Please indicate the extent to which you agree or disagree with the following statements that relate to the treatment of hip and knee OA.

	Totally disagree	Largely disagree	Disagree to some extent	Agree to some extent	Largely agree	Totally agree
Increased pain indicates new tissue damage or the spread of existing damage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pain reduction is a precondition for the restoration of normal functioning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The severity of tissue damage determines the level of pain.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is the task of the physiotherapist or GP to remove the cause of osteoarthritic pain.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If osteoarthritic pain increases in severity, I immediately adjust the intensity of my treatment accordingly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If patients complain of pain during exercise, I worry that damage is being caused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pain is a nociceptive stimulus, indicating tissue damage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The best advice for pain caused by osteoarthritis is: 'Take care' and 'Make no unnecessary movements'.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients with pain caused by osteoarthritis should preferably practice only pain-free movements.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients who have suffered osteoarthritic pain should avoid activities that stress the joint.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# AUT

What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

## OA beliefs questionnaire (part two)

\* 15. Please indicate the extent to which you agree or disagree with the following statements that relate to the treatment of hip and knee OA.

	Totally disagree	Largely disagree	Disagree to some extent	Agree to some extent	Largely agree	Totally agree
Pain caused by osteoarthritis indicates the presence of organic injury.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough effort is made to find the underlying organic causes of pain caused by osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If therapy does not result in a reduction in pain caused by osteoarthritis, there is a high risk of severe restrictions in the long term.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduction of daily physical exertion is a significant factor in treating pain caused by osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The cause of osteoarthritic pain is unknown.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Functional limitations associated with pain caused by osteoarthritis are the result of psychosocial factors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Totally disagree	Largely disagree	Disagree to some extent	Agree to some extent	Largely agree	Totally agree
Psychological stress can contribute to pain caused by osteoarthritis even in the absence of significant tissue damage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge of the tissue damage is not necessary for effective therapy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is no effective treatment to eliminate pain caused by osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A patient suffering from severe pain caused by osteoarthritis will benefit from physical exercise.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



# AUT

What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

## OA beliefs questionnaire (part three)

\* 16. These are statements that patients have expressed about their knee or hip osteoarthritis. For each statement, evaluate to what extent you agree or disagree with the statement.

	1 Totally disagree	2	3	4	5	6	7	8	9	10 Totally agree
Old age is the main cause of knee and hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knee and hip osteoarthritis is caused by cartilage wear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Traumas are the main cause of knee and hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knee and hip osteoarthritis cannot be cured.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nothing can be done to modify the progression of knee and hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knee and hip osteoarthritis is a fate for which not much can be done.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical activities are harmful for knee and hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wet weather makes knee and hip osteoarthritis worse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 Totally disagree	2	3	4	5	6	7	8	9	10 Totally agree
Some diets or food supplementations can prevent knee and/or hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis will soon be unable to walk any more.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis will end up in a wheelchair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis will have to give up my leisure activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis will have to stop sport activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis will depend on others for activities of daily living.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis will not be able to climb stairs anymore.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# AUT

What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

## Osteoarthritis Beliefs

\* 17. These are statements that patients have expressed about their knee or hip osteoarthritis. For each statement, evaluate to what extent you agree or disagree with the statement.

	1 Totally disagree	2	3	4	5	6	7	8	9	10 Totally agree
Knee and/or hip injections can damage knee cartilage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using a cane gives the image of very old age.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercises are useless for knee and/or hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medications are not helpful for knee and/or hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surgery is inevitable when you have hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surgery is inevitable when you have knee osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
General practitioners (GPs) are not interested in knee and hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physiotherapists are not interested in knee and hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prescribing investigations (i.e. x-ray, MRI) for my patients with knee and/or hip osteoarthritis makes them feel more secure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 Totally disagree	2	3	4	5	6	7	8	9	10 Totally agree
General practitioners usually do not refer patients with knee and hip osteoarthritis to specialists because it is a common and benign disease.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physiotherapists usually do not refer patients with knee and hip osteoarthritis to specialists because it is a common and benign disease.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GPs underestimate pain in knee and hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physiotherapists underestimate pain in knee and hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GPs do not have much to offer for people with knee and/or hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physiotherapists do not have much to offer for people with knee and/or hip osteoarthritis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis hold inappropriate beliefs about the cause of their condition.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis hold inappropriate beliefs about the prognosis of their condition.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my patients with knee and/or hip osteoarthritis hold inappropriate beliefs about treatment of their condition.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1	2	3	4	5	6	7	8	9	10
	Totally disagree									Totally agree
The clinical diagnosis of knee and/or hip osteoarthritis can be challenging to make.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

#### Clinical Vignette (Case Study)

A 66-year-old woman presents to your clinic with a 6-year history of left knee pain, which was of insidious onset and has gradually worsened over time. She is a retired shop manager and usually enjoys gardening, but this has become difficult due to her knee problem. Her general health is good, despite being overweight and having mild hypertension. She also has pain in both hands.

Today, she rates the intensity of her knee pain as 6 out of 10. Descending stairs, bending, and rising from sitting all aggravate her knee pain. She has some difficulty when walking and has started to use a cane outdoors. Her knee is stiff first thing in the morning and after staying in one position for too long. She finds some relief from an anti-inflammatory gel and takes up to three 200-mg ibuprofen tablets per day.

Despite not having a radiograph, she feels her problem is due to arthritis, as her father had this. This the first time that she has consulted with a health professional about the problem, and she is optimistic about its outcome. On examination, the left knee has a mild effusion and a valgus alignment. Flexion is limited, and the quadriceps femoris muscles are weak. The joint line is tender on palpation. No other examination findings are remarkable.

\* 18. Would you be likely to refer this patient to another health care professional?

- ☐ Yes
- ☐ No

\* 19. If you answered yes to the above question, please indicates the health professions that you would refer this woman to.

- ☐ Acupuncturist
- ☐ Chiropractor
- ☐ Dietitian
- ☐ Exercise physiologist
- ☐ General practitioner (GP: if this is not your profession)
- ☐ Local pharmacist
- ☐ Occupational therapist
- ☐ Orthopedic surgeon
- ☐ Osteopath
- ☐ Pain clinic
- ☐ Physiotherapist (if this is not your profession)
- ☐ Podiatrist
- ☐ Psychologist
- ☐ Rheumatologist
- ☐ Support group
- ☐ Other (please specify)

\* 20. Once you have made your diagnosis, what approaches would you use to treat this patient? (Please tick all that apply).

- ☐ Advice and education
- ☐ Intra-articular injection (steroid or similar)
- ☐ Therapeutic exercise
- ☐ Rest
- ☐ Ice or heat
- ☐ Acupuncture
- ☐ Manual therapy
- ☐ Prescription of simple analgesics
- ☐ Prescription of opioid-based analgesics
- ☐ Prescription of non-steroidal anti-inflammatory drugs
- ☐ Strapping or bracing
- ☐ Other (please specify)

\* 21. Would you offer any advice as part of your treatment?

- ☐ Yes
- ☐ No



\* 22. If you answered yes to the above question, please specify what this advice would be.  
(Please check all that apply).

- ☐ Use of knee support
- ☐ Analgesia
- ☐ Reducing activity level
- ☐ Weight loss
- ☐ Pacing of activities
- ☐ Rest
- ☐ Nutrition
- ☐ Increasing activity level
- ☐ Use of walking aids
- ☐ Use of heat or ice at home
- ☐ Avoidance of painful movement or activity
- ☐ Other (please specify)

\* 23. How many times would you be likely to see this patient for this condition?

- ☐ Once
- ☐ 2 or 3 times
- ☐ 4 or 5 times
- ☐ 6 or 7 times
- ☐ More than 7 times

The logo for AUT (Auckland University of Technology) is displayed in a stylized, white, blocky font on a black rectangular background.

What are clinicians' beliefs about the treatment of hip and knee osteoarthritis (OA) in New Zealand?

Finished

Thank you for taking the time to complete this survey. Your answers will be very helpful.

If you wish to enter the prize draw to one of two FitBit Blaze smart watches, please copy the link below and click 'Done' at the bottom of the page (otherwise the survey will not be submitted).

Paste the below link into your web browser, enter your email when prompted. The email will not be connected to the answers that you have just provided.

<https://www.surveymonkey.com/r/FitBitprizedraw>

Kind regards,

Daniel

## Appendix P - Ethics confirmation clinicians' survey



### AUTEC Secretariat

Auckland University of Technology  
D-88, WU406 Level 4 WU Building City Campus  
T: +64 9 921 9999 ext. 8316  
E: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)  
[www.aut.ac.nz/researchethics](http://www.aut.ac.nz/researchethics)

11 August 2016

Sandra Bassett  
Faculty of Health and Environmental Sciences

Dear Sandra

Re Ethics Application: **16/284 What are clinicians' beliefs about the treatment of hip and knee osteoarthritis in New Zealand?**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTECH).

Your ethics application has been approved for three years until 10 August 2019.

As part of the ethics approval process, you are required to submit the following to AUTECH:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 10 August 2019;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 10 August 2019 or on completion of the project.

It is a condition of approval that AUTECH is notified of any adverse events or if the research does not commence. AUTECH approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTECH grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz).

All the very best with your research,

A handwritten signature in black ink, appearing to read 'K O'Connor'.

Kate O'Connor  
Executive Secretary  
Auckland University of Technology Ethics Committee

Cc: Daniel O'Brien, Valerie Wright St Clair, Richard Siegert

## Appendix Q – Clinicians' survey advert

Do you treat patients with osteoarthritis (OA) of the hip or knee? If so, we want to hear from you.

AUT

Osteoarthritis (OA) is a common condition affecting thousands of New Zealanders, treatment for many of these people includes consultation with a general practitioner (GP) or physiotherapist.

We are currently undertaking a survey to understand what GPs and physiotherapists in New Zealand believe about the treatment of their patients' hip and or knee OA. The survey is part of the lead researcher's PhD and the first of its kind in New Zealand and it is hoped that the findings from the survey will contribute to future development of health services for people with OA.

To participate in the study you must be a New Zealand registered GP or physiotherapist, have seen a patient with either hip or knee OA in the past six (6) months, and currently reside in New Zealand. All those who complete the survey can elect to go into the draw to win one of two FitBit 'Blaze' smart watches valued at \$365.

For more information and to contribute to this study, please go to [www.surveymonkey.com/r/cliniciansOAbeliefs](https://www.surveymonkey.com/r/cliniciansOAbeliefs)

