Can a training programme in motivational interviewing change musculoskeletal physiotherapists' practice? The example of low back pain

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Abstract

Background

Low back pain (LBP) is a leading cause of disability nationally and globally, and forms between 40% and 65% of musculoskeletal physiotherapists' caseloads in the UK. Despite professional expectations to deliver person-centred practice, a biomedical and practitioner-centred perspective continues to dominate within physiotherapy. Many physiotherapists lack the knowledge and skills to deliver psychologically informed practice, which for persistent LBP requires consideration of the needs, preferences and values of the patient. Motivational interviewing (MI) has been recommended as a psychologically informed approach for physiotherapists working with persistent LBP patients, although little research has been carried out into its use.

Aim

This study aims to investigate the effects of MI training on physiotherapists' beliefs, attitudes and practice in relation to persistent LBP.

Methods

A convergent parallel mixed methods study was undertaken. Volunteer musculoskeletal physiotherapists (n=16) were recruited from two musculoskeletal physiotherapy departments within a Community NHS Trust in greater London and allocated to either a MI training Group A (n=10) or a comparison Group B (n=6). The MI training group received an initial two-day MI course followed up by monthly supervision sessions delivered in the workplace. Outcomes were measured pre-training (baseline) then at three and six months later for both groups. Beliefs and attitudes and to persistent low back pain were measured using the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) and the Health Care Providers Pain and Impairment Relationship Scale (HC-PAIRS). Self-reported proficiency, confidence and intention to use MI were measured using visual analogues scales (VAS). The Motivational Interviewing Training Integrity scale (MITI) generated global ratings and behaviour counts from audio-recordings of initial consultations with persistent LBP patients. The implementation and impact of MI in practice was explored through semi-structured interviews with Group A physiotherapists only at six months.

Results

A significant post-training decrease in biomedical orientation was demonstrated between the MI training group and the comparison group at three months (HC-PAIRS) and six months (PABS-PT and HC-PAIRS) using independent t-tests. The MI training group had significantly increased proficiency, confidence and intention to use MI at three and six months (VAS); and increased MITI global ratings of Spirit (at three months), Collaboration (at three months) and Evocation (at six months). Qualitative content analysis of the semi-structured interviews revealed that the physiotherapists embraced MI as an approach. They were able to overcome initial challenges of putting MI training into practice such as time pressure and level of difficulty in changing ingrained practice and language, and found positive individual and collective ways to introduce and sustain their use of MI.

Discussion

The results of this study contribute new insights into the understanding of the role and impact of training musculoskeletal physiotherapists in MI, although the small sample size means that the results should be interpreted with caution. MI is acceptable to physiotherapists. Physiotherapists were able to embrace the spirit of MI and to embed MI within their practice. This allows them to development their skills as person-centred practitioners and to cope more effectively with patients perceived as difficult and those with complex presentations. However, ongoing supervision is required to develop MI proficiency, which can be expensive.

Mi is acceptable to physiotherapists who seem keen to adopt this psychologically informed approach However, for MI practice to become adopted more widely across the profession, sustainable training approaches and appropriate professional support structures are required.

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List of Abbreviations

ABS.mp	Attitudes to Back Pain Scale for musculoskeletal practitioners
ACT	Acceptance and commitment therapy
AHCPR	Agency for Healthcare and Policy Research
AHP	Allied health professionals
AQP	Any Qualified Provider
BECCI	Behaviour change counselling index
CBT	Cognitive behavioural therapy
CFT	Cognitive Functional Therapy
CPGs	Clinical practice guidelines
CSAG	Clinical Standards Advisory Group
CSP	Chartered Society of Physiotherapy
ECWS	European Working Conditions Survey
EU	European Union
FABQ	Fear-avoidance Beliefs Questionnaire
FABT	Fear-Avoidance Beliefs Tool
GBD	Global burden of disease
GCR	Global Clinical Ratings
GP	General Practitioner
GRADE	Grading of Recommendations Assessment, Development and Evaluation
GROMIT	Global Rating of Motivational Interviewing Therapist
HBM	Health Belief Model
HCP	Health care provider
HC-PAIRS	Health Care Providers' Pain and Impairment Relationship Scale
HCPC	Health and Care Professions Council
HRA	Health Research Authority
IASP	International Association for the Study of Pain
IBMT	Interactive Behavioural Modification Therapy
ICC	Intra-class correlation coefficient
IRAS	Integrated Research Application System
LBP	Low back pain
LSBU	London South Bank University
NICE	National Institute for Health and Care Excellence
MI	Motivational interviewing
MI-SCOPE	Motivational Interviewing Sequential Code for Observing Process Exchanges
MIA	MI adherent
MIAS	Motivational Interviewing Assessment Scale
MET	Motivational enhancement therapy
MINA	MI non-adherent
MINT	Motivational Interviewing Network of Trainers
MIPC	Motivational Interviewing Process Code
MITI	Motivational Interviewing Training Integrity scale
MISHCE	Motivational Interviewing Skills in Health Care Encounters
MISTS	Motivational Interviewing Supervision and Training Scale
MRI	Magnetic Resonance Imaging
MSK	Musculoskeletal
PAIRS	Pain and Impairment Relationship Scale
PABS-PT	Pain Attitudes and Beliefs Scale for Physiotherapists
PCC	Pearson correlation coefficient
PCOQ	Patient Centred Outcomes Questionnaire
PIA	Personal interaction attitudes

PIS	Participant information sheet
RCGP	Royal College of General Practitioners
RCT	Randomised controlled trial
REC	Research Ethics Committee
RMDQ	Roland and Morris Disability Questionnaire
SDT	Self-Determination Theory
SFA	Solution focused approach
STarT BST	STarT Back Screening Tool
TPB	Theory of Planned Behaviour
TOA	Treatment orientation attitudes
TSK	Tampa Scale for Kinesiophobia
TSK-HC	Tampa Scale for Kinesiophobia for Health Care Practitioners
TTM	Transtheoretical Model of Change
UKCCC	UK Council of Clinical Communication
UREC	University Research Ethics Committee
VAS	Visual analogue scale
VASE	Video assessment of simulated encounters
YACS	Yale Adherence and Competence Scale
YLD	Years lived with disability
WATOCI	Working Alliance Theory of Change Inventory
WCPT	World Confederation for Physical Therapy

Chapter 1 Introduction

1.1 Background

According to the World Confederation for Physical Therapy (WCPT):

Physical Therapy is concerned with identifying and maximising quality of life and movement potential within the spheres of promotion, prevention, treatment/intervention, habilitation and rehabilitation. This encompasses physical, psychological, emotional, and social wellbeing (WCPT, 2011).

The Chartered Society of Physiotherapy (CSP) outlines on its website the four pillars of physiotherapy practice which are massage, exercise and movement, electrotherapy, and kindred methods of treatment (CSP, 2016). The guidance provided by the CSP's Quality Assurance Standards for Physiotherapy Service Delivery (CSP, 2012) outlines the expectation for physiotherapists: to be person-centred and work in partnership with their patients (section 4); to communicate effectively with the patient and all those involved with their care in order to meet service users' preferences and needs (section 7), and to provide individualised care and undertake clinical care in partnership with patients (section 8). Physiotherapists are also expected to identify and engage with the best available evidence in the management and treatment of their patients (section 8).

Person-centred and effective communication are reiterated as key elements of delivering an effective service in the CSP's Code of Members' Professional Values and Behaviour (CSP, 2011; section 3). In addition to reaffirming the need to be aware of the key practice expectations within the physiotherapy profession, the Health and Care Professions Council (HCPC)'s Standards of Proficiency for Physiotherapists specifically mention the need to communicate effectively in some detail with patients (section 8) and to engage in evidence-based practice (section 12) (HCPC, 2013).

Therefore, the professional expectations placed upon physiotherapists to be person-centred, to work in partnership with their patients, to communicate effectively with patients, and to be evidence-informed, are clearly stated. However, many musculoskeletal physiotherapists do not always exhibit person-centredness, for

example in the management of persistent low back pain (LBP), where their behaviour has been identified as more practitioner-centred, and biomedically focused (Synnott *et al*, 2015; Roberts *et al*, 2013).

Physiotherapists have an important role to play as primary or secondary care practitioners in assessing and managing patients presenting with long-term musculoskeletal complaints such as persistent LBP (Murphy *et al*, 2013). The need for person-centred practice, incorporating a biopsychosocial approach in physiotherapy interventions for persistent LBP, is recognised by physiotherapists in the UK and other western countries (Alexanders *et al*, 2015; Jeffrey and Foster, 2012; Nicholas and George, 2011). In relation to LBP, such practice has been termed psychologically informed practice, which may include behavioural and cognitive interventions, as well as or instead of biomedical management approaches to persistent LBP (Main and George, 2011).

Despite a broad acceptance of psychologically informed practice within the profession, physiotherapists experience significant challenges in implementing this practice approach (Sanders *et al*, 2013; Jeffrey and Foster, 2012). In order to embrace a person-centred approach and psychologically informed practice, physiotherapists need to place a greater emphasis on promoting physiotherapist-patient collaboration, and recognising the patient's lived experiences, history and treatment preferences (Josephson *et al*, 2013).

The treatment approach of physiotherapists is likely to be influenced by his or her beliefs and attitudes, which are often biomedically-focused (Mudge *et al*, 2014; Bishop *et al*, 2008). This may be due in part to the inadequacy of pain education and variability of psychological content in the undergraduate curricula of health care professions, including physiotherapy (Heaney *et al*, 2012; Briggs *et al*, 2011). Even when physiotherapists are willing to engage with psychologically informed approaches, they have reported that training courses are often insufficient for developing the skills required to work effectively with patients in practice (Synnott *et al*, 2015).

Most clinical research within the field of psychologically informed physiotherapy practice has focused on cognitive behavioural therapy (CBT) for approaches and their use by physiotherapists alongside usual care for LBP (Hall *et al*, 2016a; Lamb *et al*, 2010; Johnson *et al*, 2007b; Hay *et al*, 2005).

Motivational Interviewing (MI) is a psychologically informed approach which has been recommended by physiotherapy researchers for the management of persistent complaints, including LBP (Nijs *et al*, 2013; Foster and Delitto, 2011). This approach may assist physiotherapists to develop a more collaborative style of communication within which they could elicit, explore and enhance a patient's intrinsic motivation for behaviour change, in line with treatment recommendations (Rollnick, Miller and Butler, 2008). The adoption of behaviour change approaches, such as MI, by health care practitioners can be challenging for many reasons such as practitioner resistance to practice behaviour change and unsupportive working environments (Östlund *et al*, 2015b). Little research has been carried out on the impact of training physiotherapists in MI.

This thesis will focus on the impact of MI training on musculoskeletal physiotherapists' beliefs, attitudes and clinical practice. Persistent LBP will be used as an illustrative example throughout the thesis. This clinical condition has been selected for several reasons including: the frequent occurrence of LBP within a musculoskeletal physiotherapist's caseload (Liddle et al, 2009); the recognised role of psychosocial factors on clinical outcome in persistent LBP patients (Pincus and McCracken, 2013); the challenges reported by physiotherapists in working with this specific patient group (Sanders *et al*, 2013; Jeffrey and Foster, 2012); and recommendations from researchers for physiotherapists to develop psychologically informed practice as a 'core' approach for the management of LBP (Main and George, 2011) . Section 1.3 provides some further rationale for the use of LBP as the illustrative vehicle in this thesis and provides more detail of the classification and definitions of LBP which are applied throughout the thesis.

The researcher is a Chartered Physiotherapist, registered with the Health and Care Professions Council (HCPC), with over 20 years of clinical experience in the management of musculoskeletal conditions in NHS and private practice settings. Over the past fifteen years, the researcher has become increasingly interested in the reported role of and research into psychologically informed practice in the physiotherapeutic management of LBP. Her interest and knowledge base in this field was developed further through attending relevant educational workshops, accessing resources available via relevant clinical networks such as the Physiotherapy Pain Association (PPA; http://ppa.csp.org.uk), the British Association for Behavioural and Cognitive Psychotherapies (BABCP;

http://www.babcp.com/Default.aspx), and the Motivational Interviewing Network of Trainers (MINT; http://www.motivationalinterviewing.org/).

1.2 Physiotherapy practice

Physiotherapy practice for the management of low back pain can be considered from both a conventional approach and the more recently proposed psychologically informed approach (Main and George, 2011). Psychologically informed physiotherapy emphasises the need to integrate biomedical and psychosocial approaches to care within a biopsychosocial framework. Table 1.1 provides a summary comparison of conventional physiotherapy and psychologically informed physiotherapy across the key domains of philosophical stance, underpinning concept and practice-based features. The remainder of the section will introduce the two approaches and their key characteristics.

Table 1.1 Comparison of conventional and psychologically informed physiotherapy approaches

	Conventional Physiotherapy	**Psychologically Informed Physiotherapy**
Philosophical stance (Petty *et al*, 2012)	Positivist / post-positivist	Constructivist
Underpinning concept/model (Frankel *et al*, 2003; Bensing, 2000; Engel, 1977)	Biomedical	Humanistic / relationship-centred
	Medical	Biopsychosocial
	Reductionist	Holistic
Treatment orientation (Houben et al, 2005b)	Biomedical	Behavioural
	Pain-contingent	Time-contingent
	Treatment of physical pathology	Promoting of functional activity
	Practitioner-centred	Person-centred
Primary treatment goal (Main and George, 2011)	Reduce symptoms	Secondary prevention of disability
Primary treatment focus (Main and George, 2011)	Physical impairment	Patient beliefs as obstacles to recovery

1.2.1 Conventional physiotherapy approach to LBP

Best practice reviews of physiotherapy, based on the latest evidence and clinical practice guidance, have highlighted consistently the importance of assessment in relation to LBP, including subjective history taking, objective clinical examination and diagnostic triage (Jull *et al*, 2015; Petty, 2011; Moffett and McLean, 2006). The goal of diagnostic triage is to differentiate the patient's back pain into one of the following three categories through the use of specific questioning and follow-up examination where indicated: serious spinal pathology, also known as 'red flag' conditions (such as infection, tumour, or fracture, approximately 1%); sciatica/radicular syndrome (approximately 5-10%); and non-specific LBP (approximately 90%) (Ferguson *et al*, 2015; Greenhalgh and Selfe, 2009; CSAG, 1994).

The initial concept of yellow flags as indicators of poor recovery from LBP pain involved the recognition of psychosocial factors, including a wide range of psychological, social and environment based factors (Kendall *et al*, 1997). The concept of yellow flags has since been reappraised and is now focused on psychological factors which are considered 'normal but unhelpful psychological reactions to musculoskeletal symptoms' in terms of recovery from LBP, for instance certain patient behaviours and beliefs (Nicholas *et a*l, 2011, p.738).

Other 'flags' have been introduced into a wider flags framework which represent obstacles to recovery, including occupationally-related factors, known as blue and black flags (Main and Burton, 2000), and orange flags which signify the presence of psycho-pathology and would usually require intervention by more specialist health care professionals such as clinical psychologists (Main *et al*, 2005). Although the wider flags framework was developed several years ago, screening for psychosocial factors has yet to be incorporated into conventional physiotherapy, with many physiotherapists questioning whether such screening is beyond their scope of practice (Synnott *et al,* 2015; Gray and Howe, 2013). Observational studies of conventional practice have demonstrated that physiotherapists often use pain-focused biomedical questioning and a practitioner-centred, directive approach with LBP patients (Hiller *et al*, 2015; Chester *et al*, 2014; Roberts *et al*, 2013).

Following initial assessment, physiotherapists often seek to subgroup non-specific LBP patients usually based on patho-anatomical, psychosocial or biopsychosocial classifying paradigms (Billis *et al*, 2012; Billis *et al*, 2007; Brennan *et al*, 2006).

However, such subgrouping lacks robust evidence (Foster *et al*, 2011; Kamper *et al*, 2010; Wand and O'Connell, 2008) and the use of biomedically-focused approaches is confounded however by the limited association between structural spinal damage and symptoms or disability levels (Chou *et al*, 2009; Carragee *et al*, 2005).

A complex and wide range of approaches and treatments are used in the management of low back problems by physiotherapists (Ford and Hahne, 2013; Rozenberg *et al*, 2012; Moffett and McLean, 2006, Gracey *et al*, 2002; and Foster *et al* 1999). Conventional physiotherapy normally consists of an active management strategy involving education, advice, and appropriate exercise to promote self-management (Moffett and McLean, 2006; Gracey *et al*, 2002; Jackson, 2001; Foster *et al*, 1999). The use of targeted interventions (cognitive-behavioural, specific exercise and manual therapy) has been indicated with patients for whom self-management has not been effective. Finally, for those off work and in persistent pain, a multidisciplinary approach is recommended. Physiotherapists have reported using advice, active exercise and mobilisations (in order of decreasing frequency), typically for between six and ten sessions (Liddle *et al*, 2009). Advice and exercise were used most commonly with other treatments, signifying that conventional physiotherapy usually consists of a multi-modal approach to care.

1.2.2 Psychologically informed physiotherapy approach

The belief that pain is experienced as a result of several influencing factors which may be biological, psychological or social in nature forms the basis of the biopsychosocial model (Engel, 1977), and psychologically informed physiotherapy (Main and George, 2011). The biopsychosocial model, which was proposed as an alternative to the medical model by physician and psychoanalyst George Engel in 1977, provided a more holistic and less reductionist model for patient care. Engel's biopsychosocial model was based on the General System Theory (von Bertalanffy, 1950) which stated that each organisational level within a system can affect another, including molecular, organic, personal and societal levels. The biopsychosocial model offered a way to humanise medicine and promote relationship-centred health care (Frankel *et al*, 2003). In physiotherapy, the use of a biopsychosocial approach has helped to bridge a gap between biomedically-focused conventional practice and a more patient or person-centred approach which gives greater acknowledgement to psychosocial factors.

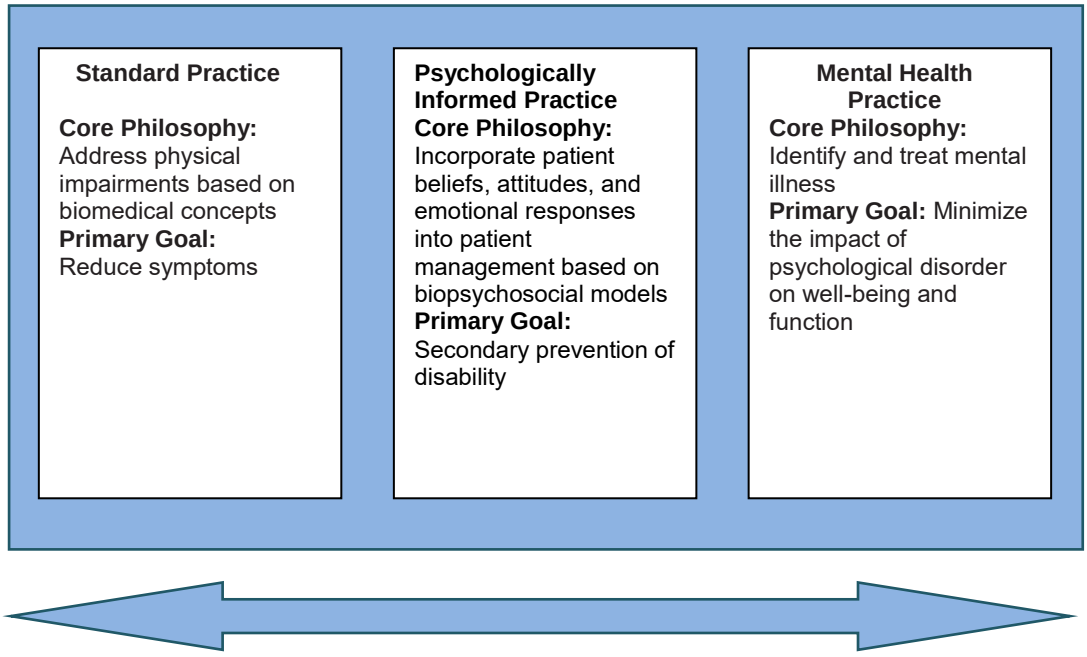
The increasing acknowledgement of the biopsychosocial model has promoted a change in emphasis in the management of chronic pain conditions, including LBP, from one which involves intervention as 'delivery of treatment' towards one which promotes and facilitates patient self-management. In line with this, research into chronic pain has shifted from approaches underpinned by a largely positivist epistemology in relation to traditional pathophysiological and patho-anatomical aspects, towards those with a more constructivist epistemology, relating to psychosocial and cultural aspects and their effect on an individual's pain experience. The challenge for health care practice and related research is how to reconcile and balance the tension between the more biomedical (positivist) elements of conventional evidence-based practice and the humanistic and psychosocial (constructivist) elements of psychologically informed and patient-centred practice (Bensing, 2000).

There has been some progress in the literature, including the proposal of psychologically informed physiotherapy practice as a theoretical approach, defined as physiotherapy practice which fits within a cognitive-behavioural framework as a means of identifying obstacles to recovery (Main and George, 2011). Psychologically informed practice has been proposed as a middle way between traditional biomedically-orientated physiotherapy (focused on addressing physical impairments to reduce symptoms) and mental health practice (focused on psychopathology and sits largely outside of a musculoskeletal physiotherapist's scope of practice). It is not clear how this theoretical approach would be applied fully in practice, since there is no recognised biopsychosocial assessment and management framework for physiotherapists working with LBP in a practice setting (Sanders *et al*, 2013).

Main and George's (2011) theoretical framework is reproduced diagrammatically in Figure 1.1. Psychologically informed practice is presented as the central pillar, underpinned by biopsychosocial models, recognising a continuum of physical and psychological factors the authors argue should form part of standard clinical practice for physiotherapists. The other pillars represent narrowly-focused standard physiotherapy practice (on the left) which the authors consider is biomedically-orientated and concerns primarily physical factors, and mental health practice (on the right) which is psychologically-focused and based on clinical approaches developed initially for managing mental health problems. The recommended and

aspirational approach for physiotherapy is the middle pillar which integrates both biomedical and psychosocial approaches.

Figure 1.1: Proposed theoretical framework for the management of low back pain by physiotherapists (Main and George, 2011)



Research investigating the use of psychologically informed interventions by physiotherapists as part of their approach to LBP management has focused on cognitive behavioural therapies. The research has demonstrated low to moderate treatment effects, although the quality of the research is variable and a limited range of interventions has been considered to date (Hall *et al*, 2016a; Lamb *et al*, 2010; Johnson *et al*, 2007b; Hay *et al*, 2005). Whatever psychologically informed approach is used, physiotherapists must feel confident and capable of putting this into practice, otherwise they appear likely to defer to a more familiar biomedical approach (Jeffrey and Foster, 2012).

1.2.3 Person-centred care and physiotherapy practice

Person-centred care is a concept which has no agreed definition and variable terminology, often referred to using terms such as patient-centred, client-centred or

patient-focused care (Cheng *et al*, 2016; Rathert *et al*, 2013). In a Cochrane Review of interventions promoting a patient-centred approach in clinical consultations, Lewin *et al* (2001), and later Dwamena *et al* (2012), developed a widely-quoted definition for patient-centred care as having the following two features:

1. *health care providers share control of consultations, decisions about interventions or the management of the health problems with patients, and/or*
2. *health care providers focus on the patient as a person, rather than solely on the disease, in consultations*

(Dwamena *et al*, 2012, p. 4)

The terms client-centred and person-centred were introduced initially by psychologist Carl Rogers in the 1940s and 1950s within a psychotherapeutic context, which emphasised the empathic, non-directive nature of the therapeutic approach, and the importance of a more equal therapeutic relationship between the client and the therapist (Rogers, 1951).

In the absence of a universally or nationally agreed definition, different elements of person-centred care are defined and emphasised by different stakeholders depending on the context in which it is applied. Mead and Bower (2000) differentiated patient-centred medicine from a biomedical approach and practitioner-centred approach in five key dimensions including: biopsychosocial perspective; patient-as-person; sharing power and responsibility; therapeutic alliance; and doctor-as-person. On the basis of a scoping review of person-centred care within physiotherapy, Cheng *et al* (2016) concluded that there was no commonly accepted definition of the term in physiotherapy, although it is considered integral to physiotherapy practice (section 1.1).

Although the term person-centred has multiple and diverse meanings, in a rehabilitation context the approach is considered synonymous with applying a biopsychosocial model in order to seek out the patient's perspective, needs and preferences for the effective delivery of care (Leplege *et al*, 2007). These differing roles of the patient can seem challenging to practitioners, in that the patient may be viewed both as the object of rehabilitation, as well as the agent of action within the rehabilitation process.

Persistent LBP patients have identified the following dimensions as important in person-centred physiotherapy: communication; individual care; shared decision-making; information; the physiotherapist (competence and personality); and organisation of care (Cooper *et al*, 2008). Other factors which promote a sense of person-centredness include seeking out patients' communication preferences, and matching or individualising of communication, based on the level of information and decisional control sought by patients (Farin *et al*, 2012; Kiesler *et al*, 2006).

Raising awareness of physiotherapists' knowledge of the dimensions of person-centredness and improving their communication skills may impact positively on the patients' experience of physiotherapy. However, the dominant biomechanical discourse underpinning conventional physiotherapy practice poses significant challenges to implementing person-centred practice, including the ability of physiotherapists to value patient preferences in relation to their care (Mudge *et al*, 2014).

1.2.4 The role of communication and patient-physiotherapist interaction

In order to employ fully a biopsychosocial approach, appropriate and timely communication is required by the physiotherapist to enable a shared understanding of the patient's perception and impact of their pain experience, so that an appropriate clinical decision can be made and acted upon in agreement with the patient (Edwards *et al*, 2004; Jones *et al*, 2002).

Communication ability is an important element in patients' perspectives of person-centred physiotherapy (Kidd *et al*, 2011). Patients have identified the following communication skills as important in a 'good' physiotherapist: good engagement skills; a supportive and caring manner; and providing clear explanations to the patient during the consultations (Potter *et al*, 2003a).

Physiotherapist communication can impact patient behaviour and may affect outcome in LBP patients (Darlow *et al*, 2013; Barker *et al*, 2009). Communication language and approach should be considered carefully since the medical terms used in relation to LBP are not always understood by patients and/or can be

misconstrued, which can lead to inadvertent and unintended negative emotional responses (Barker *et al*, 2009).

An area of practice where communication skills seem particularly important is during encounters involving patients which physiotherapists perceive to be difficult to work with. These have been described as patients who demonstrate passivity, and conversely, aggression and/or anger, and who hold unrealistic expectations about their treatment outcomes (Potter *et al*, 2003b). In order to work more effectively with difficult patients, physiotherapists have indicated that professional development is required to enhance their communication skills and to acquire skills in behaviour modification techniques such as goal-setting, increasing active patient participation, motivating the patient and promoting self-management (Synnott *et al*, 2015; Potter *et al*, 2003b). The knowledge and skills gaps in communication may be due in part to the limited opportunities to develop and practise communication skills formally during UK physiotherapy pre-qualifying programmes (Parry and Brown, 2009).

Communication is also considered to be important in developing and establishing a positive therapeutic relationship within physiotherapist-patient consultations (Hiller *et al*, 2015; Chester *et al*, 2014; Roberts *et al*, 2013). Physiotherapists tend to direct the consultation and focus on structured language which can be used to inform treatment decision-making (Josephson *et al*, 2015).

1.2.5 Barriers to implementing psychologically informed practice

Given the increasing socio-economic necessity to increase self-management within chronic conditions such as persistent LBP, a change in physiotherapy practice to a more psychologically informed and person-centred approach which recognises the patient perspective and acknowledges patient preference, is required.

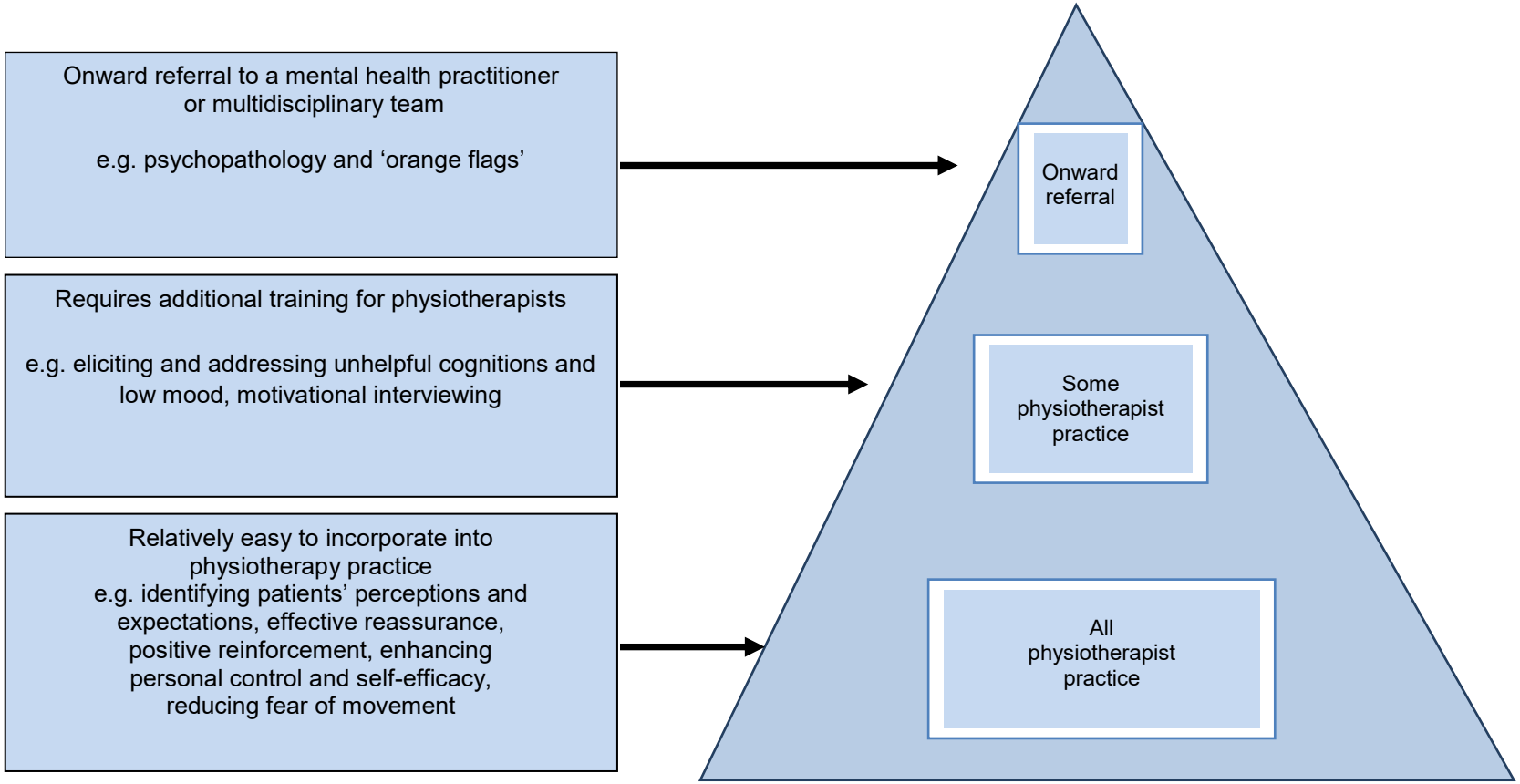
The reasons for the dominance of the biomedical beliefs, attitudes and practice among physiotherapists on an individual basis in relation to LBP management are unclear, but biomedical orientation has been associated with age (>42 years). A psychosocial orientation has been associated with educational experience (attending biopsychosocial-related courses) (Ostelo *et al*, 2003) and the

competence and confidence of physiotherapists in their skills in applying psychologically informed approaches (Jeffrey and Foster, 2012).

It has been recommended that a ‘paradigm shift’ is required amongst much of the physiotherapy profession to one which acknowledges the addressing of psychosocial factors as a core skill (Gray and Howe, 2013, p. 385). This change may require an ongoing evaluation of obstacles within the professional context, also known as black flags (Kendall *et al*, 2009) and identifying how these can be overcome locally and nationally.

Recognising the importance of psychologically informed LBP practice, while at the same time acknowledging some professional barriers which exist in its implementation, Foster and Delitto (2011) proposed a model for integrating psychosocial factors within the clinical management of LBP in physiotherapy, visually represented in the form of a psychological factors pyramid (Figure 1.2). The proposed model differentiates between skills which the authors consider should be delivered by all physiotherapists such as providing reassurance and enhancing positive pain beliefs and behaviours (pyramid base), to more advanced skills which would be delivered by some physiotherapists and would require further training such as motivational interviewing and cognitive behaviour therapies (middle layer of pyramid). The authors outlined that onward referral would be required for patients presenting with psycho-pathology, or ‘orange flags’ to practitioners who have undergone specialist mental health training and who can deliver higher level psychological interventions (apex of pyramid) (Main *et al*, 2005).

Figure 1.2: Psychosocial factors pyramid (Foster and Delitto, 2011)



1.3 The illustrative vehicle: low back pain (LBP)

1.3.1 LBP definition and classification

Over the past two decades the approach to LBP research has evolved due to an increasing understanding of pain science and an acceptance of the multidimensional nature of pain. This is exemplified by the International Association for the Study of Pain Taxonomy pain definition as:
An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.
(International Association for the Study of Pain; IASP, 1994).

LBP is commonly defined as pain felt between the costal margin and inferior gluteal folds, and sometimes includes instances of pain extending into the leg and / or other areas of the spine (Savigny *et al*, 2009; Airaksinen *et al*, 2006). Although this definition is limited by description of pain location and to perceived and self-reported symptoms at a particular moment in time, it is the most widely-used definition and for this reason will be the definition applied throughout this thesis.

Traditionally, LBP has been further classified according to time since pain onset, categorised as acute (less than six weeks), sub-acute (six weeks to twelve weeks) and chronic (more than twelve weeks) (Burton *et al*, 2004; van Tulder *et al*, 2006). This widely quoted 12-week chronic pain definition has been associated traditionally with pain which persists past the normal time of healing, inferring that more complex mechanisms may be involved in persisting pain perception (Bonica, 1953, cited in Merskey and Bogduk, 1994). Although pain duration is a significant descriptor of chronicity, this definition is biologically-focused and does not fully represent the other factors that may be associated with the development of pain persistence such as physical disability, psychological distress and occupational absenteeism (Fayad *et al*, 2004).

The traditional duration-based classification system also fails to reflect accurately the increasing awareness and acceptance of the episodic and recurrent nature of LBP (Stanton *et al*, 2008). The use of terms such as recurrent and persistent LBP appear frequently in relevant national and international LBP guidance (Stanton *et al*, 2010; Savigny *et al*, 2009; Dionne *et al*, 2008). The 2009 National Institute of Health

and Care Excellence (NICE) guidelines for persistent LBP defined persistence as LBP of more than 6 weeks' but less than 12 months' duration (Savigny *et al, 2009)*. It is this Savigny *et al* (2009) definition of pain persistence which is most relevant to this research involving psychologically informed physiotherapy, since patients' psychological factors are commonly regarded as important in promoting or mediating pain persistence in the lower back (Lee *et al*, 2015; Ramond-Roquin *et al*, 2014; Foster and Delitto, 2011). The Savigny *et al* (2009) definition of persistence in relation to LBP will therefore be applied throughout this thesis.

Other classification systems have been developed which are relevant to this study since they are used commonly by physiotherapists as part of patient assessment for LBP. The most relevant is the internationally recognised diagnostic triage of: non-specific LBP; specific pathological change ('red flag' indicators); and sciatica/radicular syndrome (Ferguson *et al*, 2015; Koes *et al*, 2010). Non-specific LBP, also known as 'simple back pain, or 'mechanical low back pain', is LBP not attributable to a recognisable, known specific pathology: this is the presentation seen most frequently, representing around 85-90% of LBP presenting to primary care (Balagué *et al*, 2012; Waddell, 2004).

The categorisation of persistent LBP patients is challenging for health care practitioners since back pain is a multi-dimensional, complex and fluctuating disorder. Patients may move through differing classification categories even during one episode of care, adding yet another layer of complexity. Reflecting this complexity, there is a range of other classification systems used frequently by physiotherapists (Smart *et al*, 2012; Haanpää *et al*, 2011; Schäfer *et al*, 2009; Fritz *et al*, 2007; O'Sullivan, 2005; McKenzie and May, 2003; Sahrmann, 2002). However, the majority of these classification systems do not recognise fully the psychosocial aspects which can be associated with pain persistence and as a result, they have had limited success as treatment indicators for persistent LBP to date (Karayannis *et al*, 2012).

In summary, and for the purposes of this thesis, persistent LBP will be defined as the following:

- Low back pain, defined as pain and discomfort, localised below the costal margin and above the inferior gluteal folds, with or without leg pain (Burton *et al*, 2004);
- Low back pain experienced between six weeks' and twelve months' duration (Savigny *et al*, 2009);
- Non-specific low back pain: that is low back pain which has no identifiable cause (Koes *et al*, 2010).

1.3.2 Low back pain impact

LBP is a major international public health problem and the number one contributor to global disability in developed and developing countries, including western Europe (Hoy *et al*, 2014; Murray *et al*, 2012). In the most recent systematic review of the global prevalence of LBP, Hoy *et al* (2012) reported mean overall prevalence as 31%, defined as all prevalence regardless of prevalence period. Lifetime prevalence rates are high, with estimates of up to 84%, and one-year prevalence rates vary significantly with estimates ranging from 15% to 65% (Balagué *et al*, 2012; Hoy *et al*, 2012; Cassidy *et al*, 2005; Walker, 2000).

The economic burden of LBP in the UK and internationally is substantial and appears to be growing (Hong *et al*, 2013; Dagenais *et al*, 2008). It is estimated that approximately 50% of LBP sufferers seek care for their condition, with one in four LBP patients consulting their GP in the UK (Ferreira *et al*, 2010; Dunn and Croft, 2006). LBP patients also constitute approximately 40% to 65% of a musculoskeletal outpatient physiotherapist's caseload, which means that physiotherapists are well placed to influence LBP management and clinical outcomes nationally (Liddle et al, 2009; Foster et al, 1999). Direct costs for LBP management include physiotherapy (17% of total), inpatient services (also 17%), pharmacy (13%), and primary care (13%) (Dagenais *et al*, 2008). The greatest costs attributed to LBP are indirect costs resulting from absenteeism in the workplace (Eurofound, 2012; Wynne-Jones *et al*, 2008).

In addition to the negative impact of pain and disability on their quality of life, patients with chronic pain syndrome can experience significant emotional distress and a sense of loss (Snelgrove *et al*, 2013). Personal experience of LBP by patients

has been characterised by the distress of the pain itself, the resulting loss of a sense of self and of lifestyle, and feelings of hopelessness and worries about what the future may hold (Corbett *et al*, 2007). For many patients, the discomfort, distress and sense of loss associated with persistent LBP is sustained over a continuous period (Snelgrove *et al*, 2013).

Patients have reported a need for their experience of LBP to be validated and legitimised, preferably through a diagnosis which can be understood by others (Froud *et al*, 2014). The patient's desire for a diagnosis can create a dilemma for the treating physiotherapist due to the diagnostic uncertainty relating to non-specific LBP (Slade *et al*, 2011). Careful language is required in discussing diagnostic labels with patients since the use of degenerative terminology can promote a negative perception of poor prognosis and encourage unhelpful beliefs (Sloan and Walsh, 2010).

Overall patient impressions of interactions with health care professionals have been reported as largely unsatisfactory, although interactions with physiotherapists are evaluated more positively than those with GPs (Cooper *et al*, 2008). Patients value being listened to, even if their problem is not resolved as a result (Cooper *et al*, 2008). Patients often feel the need to legitimise their pain to ensure their moral character; however, LBP patients can face communication challenges in explaining and expressing pain to others (Larsen *et al*, 2013; Ong *et al*, 2004).

1.3.3 Factors affecting LBP outcome

Although outcomes after the first LBP episode are generally positive in the initial three months, recurrence and persistence rates are high (Henschke *et al*, 2008). European-based studies have estimated persistent LBP rates of 23% (Airaksinen *et al*, 2006). The most recent systematic review of prevalence studies internationally estimated persistent disabling LBP rates of between 4% and 10%, which requires costly and intensive multidisciplinary intervention (Meucci *et al*, 2015).

The association between structural spinal damage and symptoms or disability levels is limited (Chou *et al*, 2009; Carragee *et al*, 2005) and this significant finding has challenged many of the assumptions which have underpinned the traditional

biomedical approach to LBP management. In addition, research investigating conventional (biomedical) approaches to the diagnosis and treatment of LBP has been unable to demonstrate adequate effect sizes and convincing treatment mechanisms (Chou *et al*, 2009; Keller *et al*, 2007). As a result, there has been an increasing focus on the role of psychological factors in moderating treatment effects and mediating treatment outcomes, including the impact of a patient's pain-related beliefs on their pain perception and their associated pain-related behaviour (Pincus and McCracken, 2013).

A range of cognitive, behavioural and emotional factors have been found consistently to be associated with recovery from LBP and to influence treatment outcome. These include the following: pain intensity and perceived risk of pain persistence (Campbell *et al*, 2013; Costa *et al,* 2009); recovery expectation (Hallegraeff *et al*, 2012; Reme *et al*, 2009); pain-related fear, including fear-avoidance and pain catastrophising (Wertli *et al*, 2014; Zale *et al*, 2013; Grotle *et al,* 2010; Grotle *et al*, 2004); anxiety, depression and distress (Pinheiro *et al*, 2016; Grotle *et al*, 2010; Pincus *et al*, 2002); coping; self-efficacy; and illness beliefs (Lee *et al*, 2015; Ramond-Roquin *et al*, 2015; Heyduck *et al,* 2014; Foster *et al*, 2010; Foster *et al*, 2008). This research has demonstrated that persistent LBP is complex and multi-dimensional and that in order to help patients overcome obstacles to recovery in persistent LBP, health care professionals should pay attention to psychological and social risk factors in addition to biological factors, and employ multi-modal approaches to care (NICE, 2017; Savigny *et al*, 2009).

1.4 Motivational Interviewing as a psychologically informed approach

Motivational interviewing (MI) is a psychologically informed approach which has received increasing interest in health care management over the past thirty years (Lundahl *et al*, 2010). MI has most recently been defined in three ways using a layperson, practitioner and technical definition (Miller and Rollnick, 2013). The technical definition echoes most strongly the previous widely-acknowledged definition for MI (Miller and Rollnick, 2009) and for this reason it will be adopted for use in this thesis. The technical definition is:

Motivational interviewing is a collaborative, goal-oriented style of communication with particular attention to the language of change. It is designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person's own reasons for change within an atmosphere of acceptance and compassion. (Miller and Rollnick, 2013, p.29)

The MI approach was first outlined by clinical psychologist William Miller in 1983, evolved from his experiences with problem drinkers, and was later developed by Miller and Rollnick (1991). The approach focuses on facilitating the patient's own motivation for change by exploring and resolving ambivalence to change, and provides a way of working with patients who do not seem ready to make changes considered necessary by the health care professional (Britt *et al*, 2004; Miller and Rollnick, 2002).

The MI approach sits within a tradition of person-centred care (Rogers, 1965), and is characterised by a spirit or mindset which relates to the nature of the intended interaction or therapeutic relationship with the patient. The MI spirit has been described by Miller and Rollnick as a 'Menschenbild', or view of nature, having four main elements focused on: partnership; acceptance; collaboration; and evocation (Miller and Rollnick, 2013, p. 18). The approach is commonly associated with the Transtheoretical Model of Change (TTM; Prochaska and DiClemente, 1982), which conceptualises behaviour change along a continuum of a state of readiness to change, notionally divided into six discrete stages. It has also been emphasised that MI is focused on the interests of the individual, rather than directing the client in new skills and that it is a communication style rather than a technique (Miller and Rollnick, 2002). MI is characterised by the use of specific communication skills, such as open questions, reflective listening, and expressing empathy (Miller and Rollnick, 2013).

The early years of MI practice development took place mainly in psychological therapies and counselling. This scope was broadened in the 1990s to wider health care applications (Rollnick, Mason and Butler, 1999). Within health behaviour change, the health care professional is the recognised expert in terms of the clinical condition and it can be challenging to not focus on fixing the patient, a professional sensibility referred to as a 'righting reflex' (Miller and Rollnick, 2013, p. 5). MI aims to

achieve a more equal partnership with patients which reduces the passivity associated with a more directive approach and facilitates joint decision-making. Instead of the health care professional imposing his or her agenda on the patient, ideas, resources and motivations are evoked or drawn out of the patient to promote a sense of control and enhance commitment to the desired change (Miller and Rollnick, 2009).

Miller and Rollnick (2013, p.18) referred to the 'honouring of autonomy' which places importance on recognising and respecting that the decision to change and the enactment of the change rests with the patient. This also requires the health care professional to respect the decision of the patient not to change. This may be challenging for many health care professionals, such as physiotherapists, due to the persistence of a more biomedical approach to care in which they often act in a more directive manner with patients (Synnott *et al*, 2015; Jeffrey and Foster, 2012).

The MI approach integrates reflective listening (or accurate empathy) and is guided by four general principles: expressing empathy; developing discrepancy between current behaviour and personal goals; rolling with resistance rather than argue against it or oppose it; and supporting self-efficacy (the client's belief in the possibility of change) (Miller and Rollnick, 2002). Although the nature of the clinical approach may be person-centred, MI is not simply a generic communication style: neither is it an interventional technique (Miller and Rollnick, 2009). MI is focused on the patient behaviour which needs to be addressed within the consultation. In the management of persistent LBP patients this may be aspects such as reducing maladaptive pain behaviour, or promoting adherence to certain advice or exercises.

Reviews of MI practice have demonstrated that this technique has significant clinical potential across a range of health, psychological and behavioural target behaviours and settings, demonstrating small to medium effects equivalent to other active treatments (Morton *et al*, 2015; O'Halloran *et al*, 2014; Lundahl *et al*, 2013; Lundahl and Burke, 2009; Knight *et al*, 2006; Rubak *et al*, 2005; Burke *et al*, 2003). Motivational interviewing is an approach which has gained popularity and is perceived as effective by medical professionals as a behaviour change approach for use with patients (Brown *et al*, 2016; Chisholm *et al*, 2012; Söderlund *et al*, 2011).

There is limited research on the use of MI by physiotherapists, although studies investigating other motivational interventions have demonstrated that their implementation may: increase patient self-efficacy and activity levels (McGrane *et al*, 2015); address recovery expectations (Iles *et al*, 2014); enhance outcome expectancy and working alliance (Cheing *et al*, 2014); and increase patient motivation, exercise, compliance and physical function (Vong *et al*, 2011).

In order to take forward MI research in physiotherapy, it is important that effective training in MI is identified for physiotherapists to develop adequate MI proficiency and be able to provide evidence of MI treatment fidelity. However, there is little research available currently on the training of physiotherapists in MI and the adoption of MI into practice.

1.5 Summary

The chapter has provided an introduction into the practice approaches of musculoskeletal physiotherapists in managing chronic pain conditions, with a focus on persistent low back pain as an illustrative example of how the approaches may be applied. Conventional physiotherapy and more recently recommended psychologically informed physiotherapy practice approaches have been described and compared. Barriers to the implementation of psychologically informed practice by physiotherapists are identified, primarily relating to the predominance of a biomedical focus in the beliefs about and attitudes to LBP, and in the clinical behaviour demonstrated in relation to its management. In order to change practitioner behaviour, additional education and training is required to develop knowledge and awareness of obstacles to recovery, including psychosocial factors and skills in eliciting and identifying these in patients. The potential of MI as a psychologically informed approach which may assist in the development of person-centred care within physiotherapy practice has been proposed.

Chapter two provides a critical review of the literature relating to the use of psychologically informed physiotherapy practice, factors influencing the adoption of MI in practice, and relevant measures of MI practice and will provide a rationale for the research. Chapter three will provide a rationale for the methodology and design of the study, and a description of the methods used in the study. Chapter four will

present and describe the study findings. Chapter five will explain and discuss the study findings in light of previous research and will outline the limitations of the study. Chapter six will conclude the thesis and considers implications for clinical practice and the profession and makes recommendations for future research.

Chapter 2 Literature Review

2.1 Introduction

A critical review is a type of literature review which 'presents, analyses and synthesizes material from diverse sources' (Grant and Booth, 2009; p. 93). The literature review is conducted in a systematic manner and efforts are made to ensure it is comprehensive and unbiased by searching relevant electronic databases using appropriate search terms. In the context of this thesis, the critical review was required to identify, collate and critically appraise evidence gaps in areas of relevant knowledge and practice, and to inform the development of the research aim, objectives and design of the present study. The review is situated within the current professional and economic context of health care provision in the UK, drawing on worldwide evidence where appropriate.

Chapter 1 described the recommendations made by researchers that physiotherapy practice for the management of chronic pain conditions (such as LBP) should shift from conventional care towards a more psychologically informed approach to care (Main and George, 2011). The first area of focus for this critical review is therefore to identify the extent to which physiotherapists use psychologically informed approaches.

MI has been recommended as a psychologically informed intervention which may enhance the ability of musculoskeletal physiotherapists to identify and help patients with complex problems such as persistent LBP overcome obstacles to recovery (Nicholas *et al*, 2011; Main and Burton, 2000). MI may also provide a skill set to help physiotherapists work with patients they find difficult to manage, particularly in relation LBP, the illustrative vehicle in this thesis (Foster and Delitto, 2011). In order for physiotherapists to develop proficiency in MI, they must be able to find ways to transfer and implement the knowledge and skills gained from training in MI into clinical practice. Although MI training has been more prevalent in other healthcare disciplines to date, factors affecting the adoption and implementation of MI by physiotherapists are yet to be identified. It is not known whether factors affecting physiotherapists would be similar or not to those experienced by other discipline groups, and therefore whether lessons could be learned from their experiences to date at the level of the individual, profession and /or working environment. The

second area of focus of this review is to identify factors affecting adoption and implementation of MI for healthcare professionals which have been trained in this approach.

In order to establish whether MI can be successfully implemented in practice, measures of MI proficiency are required to establish the effectiveness of MI training. The third area of focus of this review is to identify the appropriate, reliable and valid measures of MI adoption and implementation.

In summary and for the purposes of this literature review, a systematic approach was used to search for and review the literature based on the following three questions:

1. To what extent do physiotherapists use psychologically informed approaches?
2. What factors enable/inhibit the adoption of MI in health care practice?
3. What measures are used to assess implementation/adoption of MI practices?

2.2 The literature search

2.2.1 Method

A series of searches were conducted by systematically searching a selection of electronic databases, using specified search terms. From the searches a list of abstracts was obtained which were screened for eligibility using a number of inclusion and exclusion criteria (section 2.2). The material identified by the literature search was retrieved, read in detail and plotted onto a table, to facilitate identification of common themes according to the nature and scope of the articles. Quality assessment was guided by the Critical Appraisal Skills Programme tools (CASP, 2017). The results of the critical review are presented in the sections 2.3 to 2.5.

2.2.2 Search strategy and searches

The aim of the search strategy was to provide a comprehensive list of relevant articles. Pilot searches were carried out to identify articles from a series of searches with the aim of producing search terms with high levels of sensitivity and specificity.

Initially, the questions posed in section 2.1 were broken down into components which were used as search terms. When the combination of terms was too specific, for example psychologically informed AND physiotherapy, and resulted in important articles not being identified, additional search terms were added from existing components. For example, psychologically informed practice was broken down further into elements identified previously in section 1.2, such as person-centred and communication, as well as recognised psychologically informed interventions such as cognitive behavioural interventions and motivational interviewing. The final list of search terms used for each of the critical review questions stated in section 2.1 are listed in Appendix 1. Each search term was combined with an additional search term using the Boolean 'AND' operator. A summary of the outcomes of each search is provided in Appendix 1.

The literature search was carried out using the following electronic databases: AMED; MEDLINE; CINAHL Complete; PsychINFO; PsychARTICLES, SocINDEX; and SPORTDiscus. The databases were searched for literature over a period of 20 years (January 1st 1996 to March 31st 2017) to optimise the gathering of relevant and current evidence, and to ensure coverage of literature during a time period in which the role of psychological factors in the management of persistent pain has been increasingly recognised (Turk and Okifuji, 2002). No systematic search was conducted for grey literature or non-journal sources.

This search also included the bibliographies on the Motivational Interviewing Network of Trainers website (MINT; www.motivationalinterview.org) for relevant practice information and the University of New Mexico's Center on Alcoholism, Substance Abuse, and Addictions (CASAA; www.casaa.unm.edu) for access to current MI measurement tools.

2.2.3 Criteria for study selection

Inclusion Criteria

There was no restriction on study location, but the search was limited to articles either written or available in English due to the lack of resources available to the researcher for translation and interpretation from other languages. Articles included clinical studies, practice guidelines, and review articles. Clinical studies were

included if they had been conducted with an adult clinical population. Studies were included if they involved qualified physiotherapists. Both qualitative and quantitative studies were considered for this review.

Exclusion criteria

Papers from conferences and unpublished theses were not included due to difficulties experienced in accessing these. Opinion pieces, comments, editorials and letters were not included due to the potential for bias based on the experiences and values of the authors.

Additional criteria for question 1:

Inclusion Criteria

Articles were included where an identified psychologically informed approach was being delivered to an adult population i.e. over 18 years. Articles were included if the approach was delivered by qualified physiotherapists from any speciality.

Exclusion criteria

Articles were excluded where the intervention was being delivered to those under 18 years of age or where there was evidence of cognitive impairment which would require specialist skills. Articles investigating the work of unqualified physiotherapists such physiotherapy assistants or physiotherapy students were not included. Articles were also excluded if the psychologically informed approaches were not delivered by physiotherapists, or where the delivery was multi-professional and the physiotherapists' contribution could not be identified. In addition, articles were excluded if they did not identify an intervention or approach which was intended for delivery within or as a psychologically informed approach.

Additional criteria for question 2:

Inclusion criteria

Studies were included which involved the factors affecting the adoption and implementation of MI either prior to, during or following MI training. Studies were included which involved qualified health care workers from any discipline, or multiple groups of workers including healthcare workers.

Exclusion Criteria

Studies were excluded which did not include healthcare workers, for example included only social care workers, students (from any profession) or lay people. Studies were also excluded where MI was being learned and adopted in combination with at least one other psychologically informed approach, for example MI with CBT, or MI with acceptance and commitment therapy (ACT). Studies were also excluded where the MI approach was an adapted form of MI such as brief MI which may imply that less training and a lower level of skill may be required for its implementation.

Additional criteria for question 3:

Inclusion criteria

Studies were included which involved a motivational interviewing measurement approach or tool with a clear description of its application in any context or setting with an adult population, i.e. over 18 years of age. This also included measures of motivational enhancement therapy and behaviour change counselling. Measures were included when they were applied by other raters or coders in a professional context.

Exclusion Criteria

Measures and tools were excluded if they were applied as part of an evaluation of a clinical session by patients or clients. Articles were excluded where the intervention was being delivered to those under 18 years of age, or where there was evidence of cognitive impairment which would require specialist skills.

2.3 Use of psychologically informed approaches by physiotherapists

2.3.1 Search Results

A total of 865 articles were identified across a range of search terms listed in Appendix 1. 69 articles met the met the inclusion criteria, and following the removal of 24 duplicates, 45 articles were accepted for final analysis. Overall articles six were systematic reviews or meta-analyses, eight were practice guidance articles, nine were RCTs, six were cross-sectional surveys, ten were non-controlled clinical

studies, including case studies, and six were qualitative studies. In terms of clinical conditions to which psychologically informed approaches were applied, the vast majority of articles related to spinal pain (24). Other articles related to chronic pain applications (6), stroke / neurorehabilitation (2), two to older adults (2), knee osteoarthritis (1), rheumatoid arthritis (1), whiplash (1), musculoskeletal pain (1), coronary artery disease (1), and six were not-specified or application applied generically within practice guidance.

2.3.2 Application to practice

Despite the increasing focus on psychologically informed physiotherapy, limited high quality evidence of its effectiveness and use in practice has been identified for physiotherapists. Biopsychosocial physiotherapy approaches for chronic LBP management have been researched with positively reported results, including a systematic review of nine RCTs conducted by George (2008). As was the case in this review, the impact of physiotherapy as an approach is often hard to identify, since the multi-professional nature of chronic pain management often precludes clarification of the role of individual physiotherapists within the clinical management team and pathway. A recent systematic review of musculoskeletal physiotherapists' perceptions and practice of using psychologically informed approaches also identified that while physiotherapists were aware of and considered psychological interventions important, they felt they had an inadequate knowledge of psychology theory and lacked formal training in psychological interventions (Alexanders *et al,* 2015). Physiotherapists commonly reported using including goal setting, positive self-talk and communication strategies as psychological interventions.

Other biopsychosocial screening tools have been developed to try and assist physiotherapists and others working in primary care settings to identify factors that may predict poor recovery from LBP in the short and longer term. This includes Hurley *et al's* (2000) study to investigate the utility of a BPS assessment tool for 116 acute LBP based patients in predicting outcome from physiotherapy. However, this study was limited by a lack a control group and did not deliver a standardised physiotherapy intervention. The most visible and applied tool for stratifying and targeting LBP management on a national level is the STaRT Back Screening Tool (BST; Hill *et al*, 2011), developed from large, well designed RCT involving 851

patients presenting to primary care, which has since been recommended for use by NICE to guide the nature and intensity of LBP intervention in practice (NICE, 2017).

Several articles have been published to guide and inform physiotherapists about the theory and application of psychologically informed interventions in practice (Wijma *et al*, 2016; Russek and McManus, 2015; Main and George, 2011; Nicholas and George, 2011). Although such articles drawn on the current evidence base, it is acknowledged that they may be biased by the professional experience of the individuals involved.

Chronic pain patients appear to recognise psychologically informed physiotherapy as a novel experience which they value due to its individualised approach and the quality of the therapeutic relationship (Wilson *et al*, 2017). In Wilson et al's (2017) study patients (n=8) in a residential pain centre receiving ACT described their intervention as uniquely different from non-psychologically informed care. However, the clinical effectiveness of psychologically informed approaches is often challenging to investigate since it is not easy to differentiate complex pain interventions into simple intervention categories to allow for accurate comparison. It is therefore unsurprising that a recent systematic review and meta-analysis found no clinically significant differences between psychologically informed approaches, physical approaches and combined approaches in terms of pain and disability outcomes for chronic spinal pain patients (O'Keeffe *et al*, 2016).

The most frequently researched psychologically informed approaches for persistent LBP used by, or involving physiotherapists, are cognitive behavioural interventions. The most commonly identified cognitive behavioural approach is termed cognitive behavioural therapy (CBT), which is itself an umbrella term for several different therapies that share common elements. Traditionally, CBT combines behavioural therapy and cognitive therapy, and offers a structured approach for exploring the relationship between an individual's thoughts, emotions and behaviours (Beck, 2011). CBT may include interventions such as: patient education; identification and modification of maladaptive cognition and behaviour; relaxation method; use of coping strategies; and hypnosis.

CBT has been the main psychologically informed practice used by physiotherapists since an early description of how it may be integrated into pain management programmes many years ago (Harding and Williams, 1998). Brunner *et al*'s (2013) systematic review supported the use of operant conditioning approaches such as activity pacing, however four of eight of the studies included did not differentiate the intervention provided by physiotherapists from that provided by other health care professionals.

In a qualitative study conducted over twelve months, Australian physiotherapists (n=8) trained in a pain coping skills approach described developing cognitive-behavioural skills as enriching and useful to their practice, especially in dealing with patients who had unhelpful cognitions (Nielsen *et al*, 2014). Although these physiotherapists outlined that some elements of the approach were familiar to them and easy to implement, barriers were identified to developing and implementing new elements such as patient expectation and physiotherapist knowledge and skills. Similar barriers were also reported in survey responses from a small but randomly-selected sample of US physical therapists (n=152, response rate 88%) from a database of over 18,000 registered with orthopaedic and geriatric clinical networks (Beissner *et al*, 2009).

The challenge of integrating cognitive behavioural approaches into conventional care in the absence of a practical model was also identified by Nielsen *et al*'s (2014) participants and has been observed in UK physiotherapists who demonstrated more difficulty in implementing cognitive-behavioural techniques than a standard McKenzie approach for patients with neck and back pain, although this may be due to insufficient training of 2 days in the new approach (Green *et al*, 2008; n=10).

Case study reports have indicated that positive patient outcomes for pain and disability can be achieved using cognitive-behavioural based physiotherapy for spinal conditions (Ferrari *et al*, 2016, n=10; Archer *et al*, 2013, n=8). Although the absence of controls means that these studies are unable to demonstrated clinical effectiveness, physiotherapist-delivered CBT does appear to be an acceptable approach to physiotherapists and their patients. However, outcomes from small RCTs found that post-intervention differences for primary pain and disability measures were non-significant (Thompson *et al*, 2016, n=57; Johnstone *et al*, 2004,

n=12; Söderlund and Lindberg, 2001, n=33). Details of treatment fidelity and descriptions of the interventions were limited in these studies, and information regarding the nature and content of training provided for physiotherapists involved was variable.

A well designed large RCT comparing a six-week physiotherapist-delivered, CBT-based community programme (n=116) with a control of usual care and educational material (n=118) also failed to deliver significant improvements in pain and disability for persistent LBP patients at one year (Johnson *et al*, 2007b). It is interesting to note however that clinically important reductions were demonstrated in patients receiving CBT who expressed a preference for this approach, illustrating the importance of collaborating with patients regarding their preferred approach to care. While treatment fidelity was assessed from audio-recordings in this study and assessors found that physiotherapists were generally consistent in their application of CBT, they also noted limitations in the physiotherapists' communication skills required to deliver a CBT approach, such as challenging patients' beliefs and fears.

The effectiveness of a classification-based cognitive functional therapy (CFT) approach to the assessment and management of LBP developed by O'Sullivan (2005) has been investigated in a large RCT (n=121) (Vibe Fersum *et al*, 2012). Despite the successful outcomes reported (clinically and statistically significant between group differences), the study has limitations associated the non-assessment of treatment fidelity, the limited control provided by an active usual care approach, and the variable recruitment methods which may have affected the motivation of patients. In addition, the treatment dose was not controlled and the physiotherapists were not blinded to the intervention which may have affected their enthusiasm for the delivery of the experimental intervention.

In addition to cognitive behavioural approaches, authors have provided practice guidance articles to inform physiotherapists how they may incorporate other motivational strategies such as self-determination theory, social cognitive theory, and motivational interviewing into their practice (Pignataro *et al*, 2015; McGrane *et al*; 2014). However, these guidance articles are of limited evidential value since they are unevaluated and largely based on personal selection and interpretation of the research literature.

The use of motivational strategies by physiotherapists for LBP was investigated by Holden *et al* (2015) in a in cross-sectional survey of Australian musculoskeletal physiotherapists (n=170). The survey was circulated to a national MSK interest group and Departments in national hospitals in Australian cities. Respondents were most familiar with active goal setting (84%), CBT (80%) and MI (45%). Despite familiarity with several strategies, less than half of the respondents self-reported using CBT or MI 'sometimes', although around 25% used one or other approach with almost every patient. Reasons given for non-use of the strategies were time constraints and inadequate training, with only a small minority of respondents (6%) stating that motivational strategies were not part of the physiotherapists' role. The response rate based on the numbers of eligible physiotherapists is not reported for the study, although the national physiotherapy numbers were approximately 24,000 in 2014 according to one of the figures presented in the article. As a result, the findings lack transferability to other contexts and generalisability to MSK physiotherapists more widely.

In the only RCT to date involving physiotherapists' (n=6) use of a MI-related intervention, Vong *et al* (2011) investigated the use of 10 weeks of physiotherapy incorporating motivational enhancement therapy (MET), a bespoke MI approach, versus active physiotherapy treatment alone (interferential therapy and exercise and standard communication), for adult patients in Hong Kong with persistent LBP of longer than three months (n=76). Three different physiotherapists delivered each the two different interventions following training in MET (for those treating MET group patients) and basic communication skills (those treating control group patients). Patients were randomly allocated to groups and blinded to treatment group. The assessor was also blinded to treatment group allocation to reduce bias.

Although this approach claims to be MET, it does not appear to be based on the principles of MI (Miller and Rollnick, 2002) but rather on other motivational-enhancing factors identified from the literature. It is not clear therefore whether MI-based strategies were used in this study. Although statistically significantly higher motivational status was demonstrated in the intervention group versus the control group across at weeks 5, 10 and one-month post-treatment as measured by the Pain Rehabilitation Expectancy Scale for proxy efficacy ($p<0.001$), working alliance

(p<0.001) and treatment expectancy (p=0.011), there were no between group differences in terms of pain or disability. Other statistically significant between group effects were noted across all follow-up points for lifting capacity (p=0.015), quality of life (SF-36; p=0.015), and exercise compliance (p=0.002). Although some positive results have been achieved in terms of motivational status, exercise and quality of life outcomes, the fidelity of the intervention as an MI-based approach is questionable since it was assessed using a non-validated MET five-point strategy instrument. Patient follow up was limited to one-month post-intervention therefore the longer term effects of this intervention are not known.

In a path analysis of the outcomes of Vong *et al*'s (2011) study, Cheing *et al* (2014) tested a number of hypothesised mediation models. The best fit hypothesis supported that MET had a direct effect on working alliance which in turn had a direct effect on outcome expectancy. Outcome expectancy had a direct effect on pain intensity which had an indirect effect on physical function. Although further work is needed to establish the credibility of this hypothesis, other authors have found therapeutic alliance is an important element within a clinical encounter. Patients (n=16) described developing a strong therapeutic alliance as important in changing their pain beliefs as part of a cognitive functional therapy approach (Bunzli *et al*, 2016).

Fuentes *et al* (2014) demonstrated the importance of therapeutic alliance in LBP outcomes from a moderately sized four-group experimental controlled study comparing active and sham interferential therapy incorporating either a limited or enhanced therapeutic alliance with 117 patients. In addition, Ferreira *et al* (2013) found that higher levels of therapeutic alliance (n=7 physiotherapists; n=182 patients), measured by the Working Alliance Theory of Change Inventory (WATOCI), were associated with positive global perceived treatment effect (p=0.001), significant reductions in pain (p=0.001), disability (p<0.0001) and improved function (p=0.005) at eight weeks. Results should be interpreted with some caution since the WATOCI was measured only at the second patient consultation so may not be fully representative of the therapeutic alliance across the therapeutic episode.

Person-centred communication approaches including active listening, asking questions and demonstrating empathy are associated with a positive therapeutic alliance according to a systematic review conducted by Pinto *et al* (2014) and positive patient outcomes (fatigue) for rheumatoid arthritis patients according to an appropriately powered single blind RCT (Feldthusen *et al*, 2016; n=70). However, the use of person-centred approaches is often limited by current approaches to physiotherapy practice which are underpinned by a biomechanical discourse and in which physiotherapists assume the role of the expert (Mudge *et al*, 2014). Due to the limited efficacy of specific treatment interventions for persistent LBP (Keller *et al*, 2007), the impact of non-specific effects of treatment such as therapeutic alliance seems worthy of further investigation

In addition to the development of the therapeutic alliance, another important aspect of physiotherapists' communication within the therapeutic encounter is treatment planning, including goal setting. In a conversation analytic analysis of 74 physiotherapy sessions in a stroke rehabilitation setting, eight goal-setting encounters were identified and analysed (Parry, 2004). The analysis raised important issues about the need for physiotherapists to be able to elicit information from patients about factors which may affect goals set and to discuss the impact of this with them. This may be particularly challenging when patients have social constraints or do not wish to disclose a lack of knowledge, skill or commitment to the physiotherapist relating to the goals set. The setting of goals could be considered part of a demanding and complex process of negotiation which can be required to work with patients during longer term episodes of care and may require more highly developed communication skills (Øien *et al*, 2011).

Working collaboratively may be challenging to physiotherapists who often use pain-focused biomedical questioning and a practitioner-centred, directive approach with LBP patients (Hiller *et al*, 2015; Roberts *et al*, 2013). In an small observational study, Roberts *et al* (2013) found that physiotherapists (n=9; 25 patient consultations) tended to interrupt their patients and spoke more than their patients, suggesting a lack of an ability to listen fully to their patients' responses. However, Hiller et al (2015) observed that physiotherapists use casual conversation and touch communication to build rapport and demonstrate empathy; skills which are more consistent with person-centred care. Overall is seems that continued professional

development of physiotherapists may be useful in raising awareness of the nature and content of their communication.

Physiotherapists' communication does appear to influence patient outcomes such as pain experiences, both positively and negatively (Jeffels and Foster, 2003; Ambady *et al*, 2002). A systematic review and meta-analysis conducted by Oliveira *et al* (2015) summarised the evidence using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system (Guyatt *et al*, 2011) and found low quality evidence of small but statistically significant effect sizes of training physiotherapists in communication on outcomes of patient satisfaction, pain and disability in rehabilitation and primary care settings. The authors acknowledged the complexity of processes and pathways which exist between training clinicians in communication and patient outcomes, and the role of mediators within this sequence.

There is a need for physiotherapists to be trained in specific communication skills to impact positively on evidence-based mediators such as therapeutic alliance in order to enhance treatment adherence and optimise patient outcomes. The targeting of patient factors within person-centred communication approaches is required to promote patient empowerment and self-efficacy. The use of MI by physiotherapists has not yet been investigated fully, but this approach may provide a means of eliciting patient information, identifying a patient's intrinsic motivation for changing health behaviour and strengthening their commitment to it (Rollnick, Miller and Butler, 2008).

Although there are some positive developments within the delivery and application of physiotherapist-delivered psychologically informed practice, mainly in the use of CBT, the outcomes and quality of the studies in this field is variable, and treatment fidelity has been rarely assessed. The involvement of active control interventions is common due to ethical and practical recruitment issues in clinical trials, and their effectiveness as a comparator is not always established (Miller and Colloca, 2009). Insufficient theoretical guidance in the design, selection, and delivery of methods of psychological interventions by non-psychologists such as physiotherapists who may lack specialist training, has been cited as a reason for poor outcome in clinical studies involving non-psychologists to date (Pincus and McCracken, 2013).

2.4 Factors affecting the adoption and implementation of MI in health care practice

2.4.1 Search results

A total of 896 articles were identified in this search. Thirty-six articles met the inclusion criteria, and following the removal of six duplicates, 30 articles were accepted for final analysis. Overall five articles were systematic reviews or meta-analyses, ten were qualitative studies, 14 were post-training and one was a RCT. In terms of populations studied, ten studies involved nurses, eight involved counsellors, one dental hygienists, one exercise professionals, one GPs, one MI trainers and the remaining eight related to mixed groups of professionals, either specified or unspecified.

Factors affecting the adoption and implementation of an innovation can impact at many levels. A systematic review of implementation frameworks in healthcare conducted by Moullin *et al* (2015) analysed 49 implementation frameworks and identified core concepts of innovation within a generic implementation framework. These core concepts include those relating to the process of implementation, the innovation itself, the context, and other influencing factors, strategies and evaluations. These core concepts and associated factors will be explored within this section in relation to the implementation of MI as an innovation with health care professionals within an NHS setting.

2.4.2 The intervention: MI training methods and content

In order for MI to be adopted and implemented successfully as an intervention, healthcare professionals not trained in this approach must undertake a period of training to develop their knowledge and skills. Systematic reviews of training healthcare professionals in MI have reported significant post-training practitioner changes in MI skills in substance use disorder professionals (Hall *et al*, 2016b), mental health professionals (Barwick *et al*, 2012), and across range of professional healthcare groups (Schwalbe *et al*, 2014; Söderlund *et al*, 2011; Madson *et al*, 2009). Despite the reported success of the training, review findings are limited by

the heterogeneous use of post-training competency measures. While practitioner change may have taken place, sufficient MITI proficiency levels are not always reached, as demonstrated in an evaluation study of 36 children's nurses following an MI training workshop and 11 weeks of follow-up supervision (Bohman *et al*, 2013). Although this study was under-powered and no control data was available for comparison, 64% of participants had received prior training in MI. The authors proposed that other individual and contextual factors may be responsible for the poor training outcomes.

The nature and length of training of healthcare professionals in MI is often insufficiently described as noted in major systematic reviews of the use of MI in healthcare settings (Morton *et al*, 2015; Chilton *et al*, 2012; Knight *et al*, 2006). Systematic reviews focused on MI training have reported that it is highly variable, with the majority ranging from nine to 16 hours, normally consisting of didactic teaching and experiential exercises (Söderlund *et al,* 2011; Madson *et al*, 2009). The majority of the training studies employ a workshop format, and incorporate role play to develop skills. However, the translation of skills developed during training into effective practice requires ongoing coaching and support as identified in Schwalbe *et al*' s (2014) meta-analysis of sustaining MI following training.

Retention of MI skills is reported infrequently in the literature since MI behaviour tends to be evaluated shortly after the training takes place. Longer term outcomes have been poor in smaller non-randomised studies which have demonstrated a variation between and fluctuation within counsellor measures in the two years following training (Forsberg *et al*, 2010; n=3), and a failure of primary care nurses (n=12) to demonstrate MI proficiency during two and twelve years following training (Östlund *et al*, 2015a). However, a well-designed RCT of MI training for 140 substance abuse professionals conducted by Miller *et al* (2004) demonstrated MI proficiency gains versus pre-training baseline (measured by the Motivational Interviewing Skills Code; MISC) after an initial workshop, and at four months ($p=0.047$) in those receiving ongoing coaching and/or feedback compared with self-taught controls and a workshop only group. However, these proficiency gains were not maintained at eight months ($p=0.125$), despite the fact that the audio-recordings were self-selected and were likely to represent best practice. The researchers have hypothesised that this may be due to other individual characteristics which were not

assessed as part of this study such as motivation, since the compliance rate for audio-recording return was relatively lower in this study compared with other studies undertaken by the same research group

In terms of training content, Miller and Moyers (2006) described an eight-stage model for learning MI, which reflected the complexities involved in becoming proficient in this communication style. The eight stages included: developing openness to collaboration with clients' own expertise; developing proficiency in person-centred communication, including accurate empathy; recognising key language considerations in MI; eliciting and strengthening change talk; rolling with resistance; developing and negotiating change plans; consolidating patient commitment; and switching flexibly between MI and standard approaches to practice. The systematic review carried out by Söderlund *et al* (2011) identified that MI training content usually included development of basic skills in MI, MI spirit, recognising and reinforcing change talk, and working with difficult patients by rolling with resistance.

Despite its potential economic advantages and acceptability to practitioners, the results from the use of distance education to deliver MI training to a range of 145 healthcare professional across five workshops resulted in statistically significant though clinically insignificant knowledge gains and statistically insignificant skills gains (according to MISC) (Shafer *et al*, 2004).

In relation to the skills of the MI trainer, the involvement of an individual considered an expert coach in the field during the training process is advisable to assist in training programme design and practitioner feedback (Miller *et al*, 2004). Members of the Motivational Interviewing Network of Trainers (MINT) are used frequently to deliver training workshops in research studies (Barwick *et al*, 2012).

2.4.3 Translation of MI training into practice

2.4.3.1 Individual characteristics

Several individual characteristics of health care practitioners are associated with the development of post-training MI proficiency. One factor is the baseline counselling skill level of the participant as identified in Barwick *et al's* (2012) systematic review

and in a moderately large study involving community counsellors randomised to receive a context-tailored MI training versus MI workshop delivered training (n=144) (Baer *et al*, 2009). Other post-training evaluation studies have associated more counselling experience, a less confrontational style at baseline training (Carpenter *et al*, 2012; n=58), and a more positive attitude towards MI principles (Cook *et al*, 2016; n=394) with more successful post-training MI proficiency.

MI has been described in many small qualitative studies as an acceptable intervention to a range of healthcare professionals. It has been described as enriching and stimulating to see patients satisfied with their care by public health care nurses' (n=12) (Brobeck *et al*, 2011). These nurses considered the ability to apply MI fully or partly for a range of patients beneficial to their practice. Despite this positive outlook the nurses also described MI as demanding, that it required genuine interest and motivation to avoid regression into previous ways of working, and needed adequate time to deliver the approach.

Using MI has also been described as a positive experience by school nurses (Bonde *et al*, 2014; n=12) and by obstetric healthcare professionals (n=11) who felt it reduced stress by enhancing their skills in working with difficult patients (Lindhardt *et al*, 2015). A thematic analysis of open survey questions revealed that as a result of MI training, health visitors (n=100) said that they would be more reflective on and in practice due to an increased awareness of their own practice and language, and through listening to their patients more (Hirdle and Vaughan, 2016).

Despite positive reports of MI acceptability, MI is not always well received by practitioners. In a questionnaire survey of all district nurses and registered nurses in three central Swedish counties (n=673; 69% response rate) an unspecified number of respondents commented that MI would not suit everyone, was difficult to use and felt artificial (Östlund *et al*, 2014). A minority of the 27 professionals delivering an exercise referral scheme in Wales who were interviewed following training in MI, described being unconvinced of the value of changing their current practice to accommodate MI, typically commenting either that current practice worked, or that MI was unnecessary (Moore *et al*, 2012). Content analysis of semi-structured interviews with 20 primary care nurses trained in MI revealed that positive use of MI in practice was associated with openness to the approach (Östlund *et al*, 2015b).

Nurses who used MI less struggled to overcome insecurities in using the approach, were less motivated to learn and use MI, in some cases felt simply that MI did not suit them.

Lower traditional disease model beliefs at baseline have been associated with higher levels of MI skill development post-training (Baer *et al*, 2009). It seems likely that practitioners whose beliefs and behaviours do not align to a person-centred approach such as MI would not be as ready and motivated to participate in the MI training, nor to comply with training requirements such as providing audio-recordings; all of which are associated with poor training outcomes (Barwick *et al*, 2012). Participants in Wood *et al*'s (2011) qualitative study of MI implementation in community substance abuse settings (n=11) described as a barrier the misalignment of the MI trainee's beliefs and attitudes with the philosophy and principles of MI.

One of the reported difficulties in learning MI is the learning of something new, and to change ingrained practice behaviour. Even when practitioners accept MI positively, participants in qualitative studies have described difficulties associated with having the energy and time to practice MI (Curry-Chiu *et al*, 2014; n=9) and to continue to remain MI-consistent when working with discordant patients (Laws *et al*, 2015; n=38; Bonde *et al*, 2014). A survey of 146 experienced MI trainers (MINT member volunteers) also identified the importance of focusing on unlearning MI inconsistent approaches for practitioners new to MI, rather than simply developing new skills with a focus on developing MI consistency (Schumacker *et al*, 2014). In their experience of training health care professionals, many trainees already believed that their practice was MI-consistent.

Given the importance of practitioner commitment to MI and readiness to undertake training in MI (Barwick *et al*, 2012), several studies have used a range of self-reported measures including practitioner intent to practice, confidence, reported proficiency in MI and reported utilisation of MI (Decker and Martino, 2013; Miller *et al*, 2004; Miller and Mount, 2001). While practitioner attitudes are not always indicative of their ability to practice MI proficiently, self-reported measures such as these may indicate a willingness to develop MI-consistent practice during and after a period of initial training.

2.4.3.2 Organisational and environmental factors

The need for the availability of additional time in the work environment to support ongoing training and development of MI practice has been identified in a range of studies to date (Hirdle and Vaughan, 2016; Curry-Chiu *et al*, 2014; Östlund *et al*, 2014; Barwick *et al*, 2012; Brobeck *et al*, 2011). MI trainees require time to practice MI and have an opportunity to reflect and learn from their successes and failures in trying out a new approach. The only group who specifically said they did not need more time was GPs who had participated in an MI training programme (Rubak *et al*, 2006; n=65; response rate 100%). This may be due to the limited time available to them during consultations and the need to focus on more straight-forward applications of MI in practice.

The importance of a supportive organisational culture in implementing MI into practice has also been identified from qualitative analyses of MI training participants (Duff and Lachford, 2013, n=11; van Eijk-Hustings, 2011, n=20; Baer *et al*, 2009; Söderlund *et al*, 2008) and a previously described meta-analysis and systematic review (Schwalbe et al, 2014; Madson *et al*, 2009). Community counsellors experiencing a culture of openness to change in workplaces which hosted more supportive activities for MI practice development demonstrated an increase in MI spirit and a greater collective readiness to change in (Baer *et al*, 2009). Primary care nurses have described that MI practice was facilitated by a supportive infrastructure of peers, prompting the refining of knowledge and skills through ongoing training sessions and practice in clinical settings (Söderlund *et al*, 2008; n=20). Access to high quality supervision has been described by participants as a key facilitator of success in implementing MI across a range of providers and professionals involved in substance abuse care (Wood *et al*, 2011; Dickinson *et al*, 2006) and healthcare settings more widely (Madson *et al*, 2009).

There are no physiotherapy-based studies investigating the translation of MI into practice; however, implementing practitioner behaviour change for training physiotherapists in self-determination theory-based communication has been studied (Matthews *et al*, 2015). Using a Theoretical Domains Framework,

physiotherapist focus groups were asked to identify reasons for use / non-use of communication strategies in their primary care practice (Michie *et al*, 2005).

In Matthews *et al*'s study, eight main challenges and enablers were identified including: time and pressures of the environmental context; patient expectation of role and identity; physiotherapist knowledge and skills; social networks available for support; physiotherapists' beliefs about the importance of communication within their role; confidence in their ability to implement communication strategies; and regulating their behaviour, for instance reminding themselves to implement the communication strategies. Evidence-based approaches were identified to overcome these barriers and develop enablers to promote successful implementation of the training.

2.4 4 Factors affecting health care professionals' practice in relation to LBP

2.4.4.1 Impact on patient management

As described previously in relation to the implementation of MI, health care professionals' beliefs and attitudes can be associated with their willingness to adopt and implement new innovations (Östlund *et al*, 2014; Moore *et al*, 2012; Wood *et al*, 2011). The health care participant group in this study are physiotherapists, and the illustrative vehicle for the study is persistent LBP. This section reviews the role of health care professionals' beliefs and attitudes to LBP, with a focus on physiotherapists where they are identifiable in the literature.

Health care professionals' beliefs and attitudes to LBP are associated with the attitudes and beliefs, clinical management and treatment outcomes of patients with LBP, according to Darlow *et al* (2012). In this systematic review the health care professionals' group included a range of six professions, including physiotherapists. Overall, there was strong evidence (low quality) that health care professionals' beliefs aligned with those of their patients, and moderate evidence (low to moderate quality) that their attitudes and beliefs related to the type and content of education provided to patients, including bed rest recommendations. Higher biomedical orientation scores and elevated fear-avoidance beliefs in health care professionals were associated with a lack of adherence to LBP guidelines including advice to limit

work and physical activity (moderate strength of evidence, moderate quality). This review provided a broad analysis of the association between beliefs, attitudes and reported behaviours. However, many of the studies included in the review were cross-sectional and observational which means that there is little evidence of a causal mechanism between the constructs investigated.

A highly-cited survey of physiotherapists (n=580) and physicians (n=443) compared their attitudes and beliefs to LBP measured with the Pain Attitudes and Beliefs Scales for Physiotherapists (PABS-PT) against advice given on the basis of a patient vignette (Bishop *et al,* 2008). Although the advice provided overall was generally in line with recommendations, a large minority (28%) provided advice inconsistent with current guidelines. In agreement with the findings of Darlow *et al* (2012), the giving of advice to LBP patients to remain off work was associated with a higher biomedical orientation ($p<0.0001$) and with a correspondingly lower behavioural orientation score on the PABS-PT ($p<0.001$).

The dominance of a biomedical orientation was also identified in physiotherapists from responses to vignettes as part of a survey conducted by Bishop and Foster (2005). Five hundred and eighteen physiotherapists responded from a random sample of 900 UK physiotherapists (58% response rate). The majority of physiotherapist responders were working in musculoskeletal settings and recognised low and high-risk of chronicity from the patient vignettes. However, advice to restrict activity and refrain from work was common, signifying a more biomedically-focused approach. It is noted that while the use of vignettes in studies of this nature is not unusual, their validity as an indicator of clinical practice may be limited (Brunner *et al*, 2016).

In a qualitative study conducted by Jeffrey and Foster (2012), eleven physiotherapists were interviewed about their experiences and feelings about managing patients with non-specific LBP. Using a phenomenological hermeneutical approach, data from semi-structured interviews generated three associated themes. These were: firstly, a belief that non-specific LBP was mechanical in origin and recurring; secondly, that their attitude to treatment was to empower patients to self-manage and exercise through education and pain control; and thirdly, that physiotherapists experience challenge when their proposed intervention does not

align with patient beliefs or is not readily accepted by patients. The authors suggested that the concept of cognitive dissonance (Festinger,1957) may have utility here due to the discomfort that may be generated by the disparity between the physiotherapists' beliefs and those of their patients', and the actions taken as a result.

The impact of physiotherapist beliefs and attitudes on their behaviour is one which may not be appreciated fully by the practitioners involved. Daykin and Richardson (2004) interviewed and observed the clinical encounters of six musculoskeletal outpatient physiotherapists (and twelve patients, two per participating physiotherapist). Using a grounded theory approach, the themes that emerged from the data suggested that the pain beliefs of physiotherapists were determined by their beliefs regarding LBP patient characteristics, beliefs about craft knowledge needed to manage persistent LBP, and pain beliefs within the patient-therapist encounter. Patients unresponsive to physical treatment and for whom a more psychosocially-focused intervention would seem to be indicated were considered difficult or uncooperative. A tentative theory was proposed by the authors that the biomedically oriented pain beliefs of physiotherapists influenced their clinical reasoning and explanations given to their patients. This study adds further weight to the importance of the role of physiotherapists beliefs and attitudes in relation to their practice. It is acknowledged that the sample size in this study was small; however, the recording of physiotherapist practice was authentic since it took place through direct observation during the therapeutic encounter.

A pattern of continuing to treat patients without an improving situation has been identified in a mixed methods study by Pincus *et al* (2006a) involving a survey of physiotherapists, osteopaths and chiropractors (n=354; response rate 59%). Semi-structured interviews were carried out with of a purposive sample of 14 clinicians from each professional group. Reasons given for over 10% of the cohort reporting that they would continue to treat included patient preference, and that the alternative of referring back to the GP or another professional would place the patient in the of a health care void.

2.4.4.2 Measuring practitioner beliefs and attitudes in relation to low back pain

It has been established in the previous section that the beliefs and attitudes of health care professionals to LBP affects their practice behaviour in relation to LBP. It is important to establish for this study, which involves LBP as the illustrative example, whether any reliable and valid tools exist to measure practitioner beliefs and attitudes towards LBP.

Bishop *et al* (2007) conducted a critical review of tools used to measure health care providers beliefs and attitudes about LBP. A search of literature between 1990 and 2006 identified 12 papers which are described and utilised five established tools: the Health Care Providers' Pain and Impairment Relationship Scale (HC-PAIRS; Rainville *et al*, 1995); the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT; Ostelo *et al*, 2003); the Attitudes to Back Pain Scale for musculoskeletal practitioners (ABS.mp; Pincus *et al*, 2006b); an adapted version of the Fear-avoidance Beliefs Questionnaire (Coudeyre *et al*, 2006; Poiraudeau *et al*, 2006); and a Fear-Avoidance Beliefs Tool (FABT; Linton *et al,* 2002). Although not highlighted in this review, the Tampa Scale for Kinesiophobia (TSK; Vlaeyen *et al*, 1995; Miller *et al*, 1991) has also been adapted for use in two different studies (Houben *et al*, 2005a; 2005b).

The Health Care Providers' Pain and Impairment Relationship Scale (HC-PAIRS; Rainville *et al*, 1995) was derived by altering the Pain and Impairment Relationship Scale (PAIRS), developed originally by Riley *et al* (1988). The altered version changed the wording so that the questions related to the health care provider (HCP) with the 'chronic' back pain patient as the subject. The questionnaire measures the beliefs of health care practitioners about the relationship between persistent LBP and functional impairment. The questionnaire generates a total score which indicates the degree to which the HCP believes that persistent LBP justifies impairments and disability. A higher score indicates a higher level of agreement with this position, indicating a more biomedical orientation. This questionnaire is composed of 15 items. Participants rate their level of agreement with each of the 15 items on a seven-point Likert scale from 1 (completely disagree) to 7 (completely agree).

Following an exploratory factor analysis of the responses of 216 HCPs who completed the HC-PAIRS, Rainville *et al* (1995) proposed a four-factor structure which accounted for 56% of the variance and retaining all of the original 15 items. The initial factor analysis identified four dimensions of belief as follows: functional expectation (9 items - item 1, 2, 3, 6, 7, 8, 9, 11, 12), social expectation (4 items - item 5, 7, 11, 14), need for cure (3 items – item 4, 9, 15), and projected cognition (2 items – item 10, 13). However, the authors found that inclusion of the fourth factor, the projected cognition state, generated by items 10 and 13 on the questionnaire, lowered internal consistency, and as a result concluded that this dimension could be deleted from the scale.

A confirmatory factor analysis of the HC-PAIRS was conducted by Houben *et al* (2004) with 156 musculoskeletal therapists (including physiotherapists) who were asked to complete the questionnaire, provide views about pain and activity-related aspects for three vignettes, and answer questionnaires relating to perceived harmfulness of physical activity. The questionnaire demonstrated adequate validity, based on significant associations between HC-PAIRS scores and recommendations for work and physical activity from the therapist-generated data from vignettes and perceived harmfulness responses for physical activity (Pearson correlation coefficients ranged between 0.25 and 0.45; p=0.002 or less in all cases). Internal consistency was adequate based on a Cronbach's α of 0.83. This was raised to 0.84 when dimension 4 items (10 and 13) were removed. Although Rainville *et al*'s (1995) previous work had identified 4 dimensions and excluded dimension 4, this study found high levels of correlation between dimensions 1-3 (0.83 to 0.88) and questioned whether the HC-PAIRS was a unidimensional construct.

The Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) was developed by expert validation and analysis of responses of 421 Dutch physiotherapists to 36 items extracted from four different health-related questionnaires, including the Tampa Scale of Kinesiophobia, the Pain Catastrophising Scale, the Back Beliefs Questionnaire and the Fear-avoidance Beliefs Questionnaire (Ostelo *et al*, 2003). The original 20 item PABS-PT was further validated by Houben *et al* (2005b) into a 19-item tool for the assessment of physiotherapists' attitudes and beliefs. This development allowed for a refining of the

behavioural subscale in order to achieve acceptable reliability (Cronbach's α of 0.61).

The PABS-PT was developed to differentiate between two different treatment orientations, or attitudes, of physiotherapists in relation to non-specific 'chronic' LBP, considered for the purposes of this study to be the equivalent of persistent LBP. The differentiation was based on two key treatment orientations reported in the persistent LBP literature, namely 'biomedical' and 'behavioural' orientations. Physiotherapists with a higher score on the biomedical subscale are considered to have a more biomedically-focused treatment orientation and would be more likely to manage the patient's reported pain by treating the physical pathology. In doing so they are said to use a more 'pain-contingent' approach to treatment. A higher score on the behavioural treatment orientation subscale denotes a more biopsychosocial approach to managing patients, and these physiotherapists would not necessarily consider pain as an indicator of pathology. Their approach to treatment would be focused on promoting functional activity as part of a 'time-contingent' treatment approach. The questionnaire consists of 19 items or statements, with ten items referring to a biomedical treatment orientation and nine to a behavioural treatment orientation. Participants rate their level of agreement with each of the statements on a six-point Likert scale (with 0 representing totally disagree and 5 totally agree).

A systematic review of the PABS-PT was carried out by Mutsaers *et al* (2012). Of 133 studies identified through searching, only ten met the selection criteria. Positive ratings were given for internal consistency from four studies (based on Cronbach's α), and the consistency of the two-factor structure (the biomedical and behavioural orientations). Construct validity was rated positive based on the results of five studies. Reliability was considered fair based on intra-class correlation coefficient (ICC) and Pearson correlation coefficient (PCC) scores of two studies for each of the two factors, and responsiveness was positive in three studies measuring sensitivity to change follow an educational programme. Content validity and interpretability are yet to be evaluated for the PABS-PT. The authors did note the need to consider, in terms of content validity, whether the attitudes measured could be considered implicit or explicit, and whether various circumstances or contexts may impact the likelihood of a health care professional expressing one or the other.

The Attitudes to Back Pain Scale for musculoskeletal practitioners (ABS.mp; Pincus *et al,* 2006b) was developed for use in assessing the impact of practitioner attitudes on practice, training needs and as an outcome measure. The development of the scale involved musculoskeletal practitioners including physiotherapists, osteopaths and chiropractors. The scale consists of 19 items and six domains including: limitations on sessions; psychologic; connection to health care system; confidence and concern; reactivation; and biomedical. The initial questionnaire included 52 items generated from semi-structured interviews with 42 practitioners, coded into themes and two meta-themes – personal interaction attitudes (PIA), and treatment orientation attitudes (TOA).

In a follow-up study, 465 practitioners were asked to complete the 52-item questionnaire (Pincus *et al*, 2007). Factor analyses were carried out based on the two factors identified by the meta-themes, PIA and TOA. This resulted in the identification of four factors in a revised PIA of 13 items, and two factors in a revised TOA of two factors of 6 items. The overall result was a six-factor, 19-item tool with each item rated on a seven-point Likert scale from 'Completely disagree' to 'Completely agree'. Psychometric follow up studies have been limited, with no reports on reliability. Face validity was reported as good based on the placing of items into domains by a group of 14 practitioners, although this does constitute a small group.

The adapted version of the Fear-avoidance Beliefs Questionnaire (FABQ, Coudeyre *et al*, 2006; Poiraudeau *et al*, 2006) was based on the original FABQ developed by Waddell *et al* (1993), which has 11 items and two subscales, physical activity (4 items) and work (7 items). Each item is rated on a seven-point Likert scale, from 'Do not agree at all' to 'Completely agree'. Adaptations from the original scales were minimal, other than the introductory sentence. There is no psychometric data for this questionnaire, other than the validity demonstrated by a positive association between higher FABQ scores and negative advice about physical activity and higher prescribing of sick leave.

Identical to its original version for patient use (the TSK), the Tampa Scale for Kinesiophobia for Health Care Practitioners (TSK-HC) consists of 17 items rated on a six-point Likert scale from 'Totally disagree' to 'Totally agree'. This has not been

psychometrically tested, although Houben *et al* (2005a) computed a Cronbach's α of 0.81 and a Pearson's correlation with HC-PAIRS of 0.633 in the expected direction, both of which were considered adequate.

The HC-PAIRS and PABS-PT require further psychometric testing of their reliability and validity, and they have received some criticism since they were derived originally from patient-based measures (Pincus *et al*, 2006b). However, they are the most rigorously tested measures and most robust tools available currently for measuring health care professionals' beliefs and attitudes. Limitations associated with identifying attitudes and behaviour orientations through their responses to measurement tools in this way should be noted, since the participants responses may be influenced by aspects such as social desirability bias and demand characteristics. In order to overcome such influences, Houben *et al* (2004) suggested that the measurement of implicit attitudes which are more spontaneous may provide a more accurate representation of an individual's attitudes to LBP.

2.5 Measures used to assess the adoption and implementation of MI

2.5.1 Search results

A total of 727 articles were identified across a range of search terms used to address question three. The results of the search are presented in Appendix 1. Twenty articles met the met the inclusion criteria, and following the removal of three duplicates, 17 articles were accepted for final analysis. Two articles were systematic reviews or systematic searches, five involved the development and testing of new measurement tools, eight involved reliability and / or validity testing, one was a feasibility study and one a practice guidance article.

2.5.2 Measuring MI-consistent behaviour

The training of practitioners in MI has grown in recent decades as this approach has gained support. As a result, a range of measures has been developed to evaluate practitioner behaviour change following training in MI. It is recommended that implementation studies of complex behavioural interventions such as MI report

measures of practitioner fidelity, and adherence to and competence in delivering MI (Miller and Rollnick, 2014). Measures are often subjective, involving self-reports of MI competence (Rubak *et al*, 2006). However, self-reporting of MI proficiency has not always been predictive of ability to practice MI as demonstrated with substance abuse counsellors in well conducted RCTs (Miller *et al*, 2004) and randomised comparative trials even after an extended 20-week training period (Wain *et al*, 2015).

A range of objective measurement instruments have therefore been developed to evaluate practitioner behaviour change in MI research. This section will focus on the most widely researched measures including: the Motivational Interviewing Skills Code (MISC; Miller *et al*, 2008; 2003; Miller, 2000); the Motivational Interviewing Process Code (MIPC; Barsky and Coleman,2001); the Motivational Interviewing Training Integrity scale (MITI; Moyers *et al*, 2015; 2005); Motivational Interviewing Supervision and Training Scale (MISTS; Madson *et al,* 2005); the Yale Adherence and Competence Scale (YACS; Corvino *et al*, 2000); the video assessment of simulated encounters (VASE-R; Rosengren *et al*, 2008); the Motivational Interviewing Sequential Code for Observing Process Exchanges (MI-SCOPE; Martin et al, 2005); and the Global Rating of Motivational Interviewing Therapist (GROMIT; Moyers, 2004). A behaviour change counselling index (BECCI; Lane *et al*, 2005) has also been developed to measure the changes which occur within briefer health focused adaptations of MI. The BECCI measures aspects of behaviour change without consideration of certain aspects of MI style.

The Motivational Interviewing Skills Code was developed originally in 1997 to provide comprehensive information about the process of motivational interviewing (MI). Three versions have been published to date: MISC 1.0 (Miller, 2000); MISC 2.0 (Miller *et al*, 2003) and the most recent version, MISC 2.1, which was published in January 2008 (Miller *et al*, 2008). The MISC can be used with video or audio-taped recordings, and has therapist, client and interaction rating categories. A total of three separate passes is recommended to yield in turn global scores, behaviour counts, and talk time (an objective measure of the therapist and patient spends talking). Given the relative simplicity and likely agreement between coders measuring the therapist/client talk time data, assessment of MISC integrity has been focused on

the inter-rater reliability of global scores and behaviour counts identified in passes two and three.

Using the original MISC to code recordings from a large smoking cessation RCT, Moyers *et al* (2003) used several measures of inter-rater reliability. They found the ICC variable but generally good reliability in the 12 global measures of therapist, client and interaction, with ICC's which ranged from 0.40 to 0.79 for two coders across 86 recordings. The majority of ICC results are classified as good or excellent using the guidelines on psychological assessment produced by Cicchetti *et al* (1994). However, ICC was generally poor for the client global measures of affect and co-operation. Also the ICC's were highly variable for therapist behaviour counts (ranging from 0.00 to 1.00), leading to recommendations for revisions to the MISC and to develop further items to analyse the therapist-client interaction. These findings were supported in a later study analysing ICC between 5 coders across 39 recordings by de Jonge *et al* (2005). In addition to high variability in behaviour coding, de Jonge *et al* (2005) also found gaps in the content validity of the MISC and recommended that additional measures should be included to identify therapists' adherence to MI principles.

More favourable ICC's have been achieved using revised MISC versions (2.0/2.1) to analyse recordings from clinical studies involving alcohol dependency as follows: 0.50 to 0.62 for the interaction global rating scale (Gaume *et al*, 2008).; 0.43 to 0.91 for the therapist behaviour codes scale (Gaume *et al,* 2010; Gaume *et al,* 2008); and 0.72 to 0.87 for the client behaviour codes (Gaume *et al*, 2010; Vader *et al*, 2010).

The complexity of the MISC is reflected in the significant time periods required for coding. A three-pass review of a 20-minute recording can take up to two hours to code by a proficient coder and proficiency training in coding for MISC 1.0 required approximately three months of intensive, supervised training (Moyers *et al*, 2005)

Wallace and Turner (2009) undertook a systematic review of the psychometric evaluation of MI integrity measures other than the MISC, identifying eight papers covering five instruments in their search of appropriate databases and resources up to 2007. This appears to be a modest yield which may be due to the timing since MI evaluation research was still in relatively early stages at that time, and potentially as

a result of the search terms not including words relating to MI measurement, but focused on MI with education, training and learning. Based on a thorough review of the psychometric findings in the literature, the authors concluded that that psychometric evidence for MIPC, MITI, MISTS, BECCI and VASE was limited and that further work was needed to establish psychometric integrity of these measurement tools. These tools will be reviewed in the following paragraphs.

The MIPC was an early development as an MI measurement tool developed around the same time as the MISC (Barsky and Coleman, 2001). It was developed to measure essential MI skills using a modified Delphi method approach and resulted in 25 items coding system over two scales (functional and dysfunctional). Inter-rater observer agreement between three raters and eight audio-recordings was reasonable at 75% for the dysfunctional scale but only 51% for the functional scale. Face and content validity were not investigated and cannot be assumed since the level of expertise of the eleven individuals contributing to the development of the MIPC is as users of MI and workshop participants rather than as practitioners identified as experts with eleven MI users involved. Overall the psychometric evidence is very limited for the MIPC.

Due to inconsistencies in the reliability of the MI behaviour frequencies using the MISC, and the complexity of this measure, Moyers *et al* (2005) developed the Motivational Interviewing Training Integrity scale, or MITI. The MITI measures practitioner competence in using MI. The MITI items were developed from the MISC 1.0 using an exploratory factor analysis, with the aim of reducing the complexity and improving the inter-rater reliability of the MISC. The original MITI 2.0 (Moyers *et al*, 2005) has been updated and later versions have been published, including MITI 3.1.1 (Moyers *et al*, 2010), MITI 4.1 (Moyers *et al*, 2014) and the most recent MITI 4.2.1 (Moyers *et al*, 2015). Much of the recent practitioner research into MI uses MITI 3.1.1 as an MI behaviour outcome. The MITI 3.1.1 consists of two components: global rating on a Likert-type scale for across five dimensions, generating one global clinician rating score; and behaviour counts of eight therapist verbal behaviours (Moyers *et al*, 2010) which generate four summary scores for comparison with competency thresholds as presented in Table 2.1.

Table 2.1: MITI clinician behaviour count or summary-score thresholds (Moyers et al, 2010)

Clinician Behaviour Count or Summary Score Thresholds	Beginning Proficiency	Competency
Global Clinician Ratings	Average of 3.5	Average of 4
Reflection to Question Ratio (R:Q)	1	2
Percent Open Questions (%OC)	50%	70%
Percent Complex Reflections (%CR)	40%	50%
Percent MI-Adherent (% MIA)	90%	100%

In studies conducted to assess the reliability of the original MITI, ICC's for inter-rater reliability for the global rating items ranged from 0.51 to 0.71, and for behaviour counts ranged from 0.57 to 0.98 (Pierson *et al*, 2007; Moyers *et al*, 2005). Jelsma *et al* (2015) provided a review paper of psychometric studies carried out for the MITI, summarising evidence for reliability and validity for every version of the MITI up to MITI 4.1, including a Swedish version (Forsberg *et al*, 2008). Although MITI 4.1 has been shown to have face validity, research is ongoing to establish its psychometric properties (Moyers *et al*, 2016). Use of the MITI 3.1.1 has not been reported for physiotherapists; however, a previous version (MITI 2.0) has been used to demonstrate post-training practice changes with dieticians, another AHP group (Brug *et al*, 2007).

Due to the reduction in volume and complexity of analysis, coders require less training for the MITI compared with MISC, with 40 coding hours cited consistently as a training volume which provides fair levels of inter-rater reliability in psychometric testing carried out during empirical studies (Mitcheson *et al*, 2009; Moyers *et al*, 2005). Although the MITI has simplified the coding process, it is noted that focusing on the therapist behaviour alone reduces its relevance in clinical studies. The exclusion of both client and client–therapist interaction analyses prevents consideration of client factors as mediators in treatment outcomes (Martins and McNeil, 2009). In addition, the therapist focus prevents analysis of strategies utilised in MI delivery, which could be considered an important aspect of measuring clinician competence (Madson and Campbell, 2006). It could therefore be argued that the strength of the MITI lies in analysis of training of therapists in MI, rather than during

clinical research. One advantage of using the MITI 3.1.1 is that practitioner scores can be compared with summary threshold scores provided by the original authors as outlined previously in Table 2.1.

The Motivational Interviewing Supervision and Training Scale (MISTS; has been used primarily as a training tool, consisting of eight categories of behavioural counts and sixteen global ratings, scored on a seven-point scale (Madson *et al,* 2005). The scale is used to measure technical and relational ingredients within the patient-therapist interaction. Testing of the inter-rater agreement for the therapist global ratings was considered fair to excellent for three raters across a sample of 50 (from 89) audio-recordings of MI sessions from a substance abuse study (ICC 0.66 to 0.76; Madson *et al,* 2005). No inter-rater agreement ratings are available for the behavioural counts. In addition, there were some concerns regarding the convergent validity when compared with the YACS on the assessment subscale. Therefore, ongoing research is required to establish the psychometric properties of the MISTS.

The Yale Adherence and Competence Scale (YACS) was designed specifically to measure MI-based psychotherapeutic interventions known as motivational enhancement therapy (MET) (Corvino *et al*, 2000). This scale has demonstrated high levels of inter-rater reliability, with ICC's for adherence of 0.80 to 0.95 and competence of 0.71 to 0.97, in MET across three scales (Carroll *et al*, 2000). The specificity of this measure to the substance abuse field is less applicable for use with musculoskeletal physiotherapists. Similarly, the video assessment of simulated encounters measure (VASE; Rosengren *et al*, 2005), and its revised version VASE-R (Rosengren *et al*, 2008), demonstrate high levels of reliability, but have been developed to measure the skill levels in counsellors using video-based vignettes of substance abusers.

The behaviour change counselling index (BECCI; Lane *et al*, 2005) also focuses on therapist behaviour, and has been developed for use by practitioners in health care settings to measure behaviour change closely related to MI. It was developed from items generated by a literature review on behaviour change and tested within a variety of settings. Internal consistency was low (Cronbach's α less than 0.7), although ICCs of inter and intra-rater reliability were good to excellent when applied to assess practitioners working with smokers and diabetics (Lane *et al*, 2005;

Cicchetti,1994). The BECCI may provide a useful indication of behaviour change, although key limitations are that it has been tested mainly on simulated patients (Lane *et al*, 2005) and may not measure all salient elements of MI (Wallace and Turner, 2009). This tool may not have been developed sufficiently for use within a research context, although it may provide a means by which feedback can be directed to therapists during initial and ongoing training. It would be an easy tool to understand for practitioners who have no prior training in any form of behaviour change counselling.

Although the philosophy and principles of MI are well understood, the underlying mechanisms by which MI affects behaviour change are yet to be identified fully. In an attempt to develop the theory of MI, Miller and Rose (2009) proposed two specific active components of MI: a relational component focused on the interpersonal spirit of MI, and a technical component involving the evocation and reinforcement of client change talk. Dobber *et al* (2015) conducted a systematic search of literature to identify MI coding instruments which evaluate these active components or ingredients of MI. Although psychometric testing is limited Dobber *et al* (2015) recommended that the global ratings of the GROMIT (Moyers, 2004) has the best potential to measure relational component with global ratings of the MISC as an alternative option. Similarly, they recommended that technical component could best be measured by the MI-SCOPE, or by the MISC, which both measure therapist and client behaviour. The MI-SCOPE (Moyers and Martin, 2006; Martin *et al*, 2005) was originally developed for use in a large RCT Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity; Project MATCH Research Group, 1997); however, evidence of psychometric integrity is lacking.

Other measurement tools have been developed more recently which are less well recognised and in the early stages of psychometric testing. These include Onepass, a MI fidelity and supervision tool with 23 items which demonstrated good inter-rater reliability (moderate agreement using Fleiss's kappa) with three raters across 27 audio-recordings with standardised patients (McMaster and Resnicow, 2015). Concurrent validity was measured against the MITI, considered gold standard by the authors. This demonstrated high levels of correlation (Pearson's rank correlation) across a majority of items, although was confounded by low ICCs between raters on the MITI.

A Spanish version of a MI measure, the Motivational Interviewing Assessment Scale (MIAS), has been developed for use with primary care physicians and has undergone three revisions to date, resulting in a 14-item scale (Campiñez Navarro *et al*, 2016). The authors present a comprehensive mapping of the development and testing of the scale. Results from 4 raters of 354 audio-recordings of the latest version (MIAS 2.0) demonstrated variable but generally good levels of inter-rater reliability (kappa indexes 0.21-0.81), excellent internal consistency (Cronbach's $\alpha > 0.9$) and excellent convergent validity with the BECCI (Spearman's correlation coefficient 0.98), although the use of BECCI as a comparator of MI is questionable.

Other MI measurement tools reported to have promising psychometric integrity but in the early stages of development are the Coding of MI Planning tool (Copeland *et al*, 2017), developed to code planning talk within MI, and the Motivational Interviewing Skills in Health Care Encounters (MISHCE) to assess MI skills competence in health care provider trainees (Petrova *et al*, 2015).

In summary, there is a large range of instruments available to measure practitioner behaviour change in MI. Of those developed to date, the MITI 3.1.1 appears to have greatest utility currently with fair reliability, moderate training required to achieve coding proficiency, and the availability of proficiency and competency threshold scores. This instrument is limited though by its focus on practitioner behaviour alone, with no attention paid to the behaviour of the patients. Although the MITI has been used previously with dieticians (Brug *et al*, 2007), its application to other allied health professionals within research studies, including physiotherapists, is very limited. The BECCI is often used for feedback and for measuring behaviour change in practitioners during training since it is a less intensive instrument.

2.6 Research problem and study aim

The literature has demonstrated that persistent LBP is a complex and multifactorial condition both for the patient and the clinician treating them. A person-centred and psychologically informed approach is required by physiotherapists to recognise and manage both the biomedical and psychosocial obstacles to recovery from persistent LBP. Physiotherapists do not always demonstrate person-centred behaviour, and

they often exhibit practitioner-centred care, underpinned by a traditional and dominating biomechanical discourse.

Although many physiotherapists understand the importance of psychosocial approaches, they lack the knowledge and skills to put these into practice as part of conventional practice. This knowledge and skills gap may be due to several factors including: inadequate attention to psychological approaches and communication skills development in pre-qualifying physiotherapy education; insufficient opportunities and support to develop knowledge of and skills in psychologically informed approaches as part of continuing professional development; and a professional culture which focuses on biomedical approaches and places less value on psychosocial approaches. Despite ongoing research in this field, there is still no recognised approach to guide musculoskeletal physiotherapists which can satisfy all elements of the biopsychosocial framework and be applied usefully in conventional physiotherapy practice.

Due to its importance in determining their approach to clinical practice, the impact of physiotherapists' beliefs and attitudes towards persistent LBP is investigated within this study. A dominant biomedical and practitioner-centred approach is associated with a higher biomedical orientation and lower behavioural orientation in the beliefs and attitudes of physiotherapists. Therefore, interventions which can alter the beliefs and attitudes of physiotherapists to a more behavioural orientation may result in more person-centred approaches to care.

Within musculoskeletal physiotherapy, research into psychologically informed interventions for persistent LBP patients has focused on physiotherapist-delivered CBT interventions. Positive patient outcomes have been reported from using this approach, although CBT studies often lack adequate measures of treatment fidelity and details of practitioner training.

Another psychologically informed approach which has been researched less actively within physiotherapy and is the main focus of this study is motivational interviewing. In comparison with CBT, motivational interviewing is a person-centred communication style rather than an intervention per se, in which a patient's intrinsic motivation for change may be explored and enhanced. The use of MI by other

health care professionals has demonstrated good utility in promoting behaviour change across a variety of conditions and settings. However, little research exists into the role of MI within musculoskeletal physiotherapy practice. Based on the nature of MI as an approach, including the elements of MI spirit and the principles of MI, it is hypothesised that training physiotherapists in MI may promote a more behavioural, and less biomedical orientation in their beliefs and attitudes. This may promote and enable a more person-centred and collaborative approach to patient care. MI may also enhance the physiotherapists' skill set by providing a strategy for working more effectively with patients who are perceived as challenging by physiotherapists.

Although it is important that the clinical usefulness of MI is investigated in relation to patient outcomes, it would be prudent and appropriate to establish initially whether or not MI-consistent behaviour, or MI fidelity, can be demonstrated following the training of physiotherapists in MI. The impact of an MI training programme on physiotherapists' use of MI in practice is investigated as part of this study.

Given the challenges associated with the adoption of MI into the practice of non-physiotherapy health care professionals, it is important to explore the experiences of physiotherapists in adopting MI and to identify facilitators and barriers to the use of MI. This will contribute to the understanding of the nature and impact of MI training on physiotherapists and help to inform the content and design of future MI training programmes for this professional group.

This aim of this research is to investigate the impact of a motivational interviewing training programme on the beliefs, attitudes, and practice of musculoskeletal physiotherapists managing persistent LBP patients. The aim has been broken down further into three main study objectives which are to:

i. Investigate the effects of a tailored training programme in MI on physiotherapists' attitudes and beliefs regarding LBP and its management

ii. Investigate the effects of a tailored training programme in MI on physiotherapists' MI behaviour in the clinical setting with persistent LBP patients

iii. Explore the physiotherapists' experiences of the transfer and use of skills developed during training in MI into a clinical setting

Chapter 3 Methodology and Methods

The study design was driven by the research aim and objectives and based on the evidence reviewed in Chapter 2. Existing evidence has demonstrated that MI can be used effectively as a complex behaviour change intervention with a range of patient presentations. Although MI research has been more prevalent with substance abuse and addictive behaviours, evidence also suggests that MI may be useful in primary care settings with chronic health problems requiring behaviour change approaches (Morton *et al*, 2015; O'Halloran *et al*, 2014). It has also been recommended for use by physiotherapists as a higher level psychologically informed intervention approach for patients with presenting with more complex LBP, the illustrative example in this study (Foster and Delitto, 2011).

The practice approaches of physiotherapists in relation to LBP are associated with their beliefs about and attitudes to LBP and related impairment (Darlow *et al*, 2012; Bishop *et al*, 2008). Robust measurement tools have been developed to measure physiotherapists' beliefs and attitudes to LBP for this reason, with the widely used most tools being the PABS-PT (Houben *et al*, 2005b) and HC-PAIRS (Rainville *et al*, 1995).

Factors affecting the development, adoption and ongoing implementation of MI practice following a training intervention include practitioner commitment, motivation, readiness and interest in practising MI (Barwick et al, 2012). Self-reported measures of confidence, interest and commitment are sensitive to the effects of MI training and have been used frequently in research studies (Decker and Martino, 2013, Rubak *et al*, 2006). Since self-reported measures of MI proficiency are not necessarily indicative of practice ability, objective measures are also used to measure MI proficiency and practitioner fidelity (Wain *et al*, 2015; Miller and Rollnick, 2014). A range of MI measurement tools have been developed, with the MITI 3.1.1 used most frequently to measure post-training MI proficiency in practitioners due to its reliability, utility and the availability of proficiency thresholds (Moyers *et al*, 2010).

Several barriers to and enablers of the adoption of MI practice by healthcare professionals have been identified and can occur at the level of the individual practitioner as well as the professional workplace environment (Östlund *et al*, 2015b; Brobeck *et al*, 2011; Söderlund *et al*, 2008). These barriers and enablers have often been elicited by researchers using qualitative data collection methods such as semi-

structured interviews. At this early stage of developing MI training for physiotherapists, it is important to identify whether the same barriers and enablers also exist for physiotherapists through exploration of their experiences of practising MI skills and adoption of MI within a clinical setting.

This chapter will provide the philosophical and theoretical basis for the selection of the research paradigm, methodology and methods used within the study. The remainder of methods will be described in detail, including information about the study site, participants, interventions, data collection and analysis and ethical process and approvals. Finally, the steps taken to promote data trustworthiness and rigour will be explained.

3.1 Justification for the paradigm and methodology

3.1.1 Research paradigm

Crotty (1998) conceptualised research design and development across four major elements including philosophical assumptions, theoretical stance, methodological approach and methods. The elements included are presented in Table 3.1. The philosophical assumptions of a research study can be represented by defining the worldview underpinning the nature of enquiry (Guba and Lincoln, 1994).

Table 3.1: Four elements of research process (adapted from Crotty, 1998)

Epistemology	**Philosophical stance**	**Methodology**	**Methods**
Objectivism Constructionism Subjectivism	Positivism / post-positivism Social constructivism / interpretivism: - Symbolic interactionism, - Phenomenology Critical inquiry Feminism Postmodernism etc.	Experimental research Mixed methods Survey research Ethnography Phenomenological research Grounded theory Heuristic inquiry Action research Discourse analysis etc.	Sampling Questionnaire Observation Interview Focus group Document analysis Content analysis etc.

Historically, the evidence base within physiotherapy has been determined from a positivist stance, utilising quantitative methods and seeking to generalise findings of cause-effect relationships via RCTs (Driver *et al*, 2016).

A paradigm shift to a more constructivist research approach has been recommended within musculoskeletal physiotherapy and other health care professions (Petty *et al*, 2012; Greenfield *et al*, 2007; Bhandari and Giannoudis, 2006). It has been suggested that this shift may involve the generation of research questions which explore the lived experiences of patients and could facilitate more patient-focused physiotherapy interventions for the benefit of future patients (Grant, 2005). Increasing acceptance and knowledge of qualitative research approaches by physiotherapists would allow them to better understand and scrutinise the evidence generated to inform their practice. This would allow appropriate application of evidence to patient settings and contexts, rather than a reliance on large, outcomes-focused RCTs which form part of the positivist evidence base and may be limited in their application to physiotherapy practice. As has been outlined in the section 1.1, the need to ensure a more person-centred approach in physiotherapy practice is a professional expectation (CSP, 2011), as well as a clinical one (Michie *et al*, 2003).

The consideration of both positivist and constructivist perspectives in the assessment and management of persistent LBP by physiotherapists poses challenges. On one hand, physiotherapists must employ didactic questioning and structured assessment processes to rule out serious pathologies which may be causing or masquerading as LBP (red flags). This is especially so where physiotherapists are operating as first contact practitioners in increasing number of self-referral schemes (Holdsworth et al, 2008). At the same time, and where LBP appears to be persistent and non-specific, physiotherapists are expected to consider patient perspectives and circumstances, and to identify psychosocial obstacles which may be predictive or poor outcome as part of a wider flags framework (Nicholas *et al*, 2011; Main *et al*, 2005; Main and Burton, 2000).

In the context of this study, the overarching aim of the research was to investigate the impact of a motivational interviewing training programme on the attitudes, beliefs and practice of the participating physiotherapists. Three research objectives were generated which posed three independent strands of enquiry. The first two research objectives were underpinned by a positivist /post-positivist worldview or paradigm, based on an objective epistemology (Kuhn, 1996). Both positivism as introduced by

August Comte, and later, post-positivism as outlined by philosopher Popper (1963) and Kuhn (1996), are characterised by reductionist and determinist approaches which seek to verify theories in relation to known variables. In the context of this research and this worldview, a quasi-experimental research design using quantitative methods of data collection was used to measure attitudes, beliefs and behaviour in the group of physiotherapists participating in a MI training programme intervention versus a non-participant comparative (control) group.

The third research objective was underpinned by a constructivist/interpretivist perspective based on a subjective epistemology (Piaget, 1971), which sought to understand the multiple realities of physiotherapists who participated in the MI training programme (Greene, 2007). The relevance of this worldview was important in this context, since research to date has suggested that practitioners find putting MI into practice challenging (Östlund *et al*, 2015b; Söderlund *et al*, 2011; Söderlund *et al*, 2008). Therefore, the third research question sought to explore physiotherapists' experiences, using qualitative research methods to elicit participants' views and discover meaningful insights into their experiences.

3.1.2 Mixed methods research design

The use of more than one worldview, or paradigm, and differing research approaches characterised this research as mixed methods, defined by a consensus of senior researchers in a highly-cited article as follows:

> *Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purposes of breadth and depth of understanding and corroboration.*
> (Johnson *et al*, 2007a, p. 123).

Rauscher and Greenfield (2009) advocated for the use of mixed methods research within physiotherapy, arguing that it allows for a more accurate and holistic representation of disablement, rehabilitation and recovery. In addition, the authors highlighted the importance of this approach in generating new research questions and contributing to the development of complex and innovative interventions. There

are potential disadvantages of using a mixed methods approach which have been identified in the literature however (Tashakkori and Teddlie, 2010; Greene, 2007). These include: the acceptability of a mixed methods approach by the discipline; the time taken to develop the skills required to carry out research using different methodology; and the time taken to carry out the research, integrate and analyse the data sets. In the context of this research, the researcher considered that the enriching of the data through inclusion of the qualitative method outweighed these concerns.

The literature highlights the tensions that can exist regarding the mixing of qualitative and quantitative paradigms in a mixed methods approach; however, there has been a shift in emphasis towards a pragmatic philosophy (Creswell, 2013; Brannen, 2005; Johnson and Onwuegbuzie, 2004; Tashakkori and Teddlie, 2003). Pragmatic philosophy advocates moving away from traditional inquiry paradigms to a middle philosophical and methodological position to provide the most appropriate way of answering the research question(s) proposed. The pragmatic philosophy was rejected by the researcher in this study for a perspective in which multiple worldviews and forms of enquiry can exist and which form the basis for the selection of the methods (Petty *et al*, 2012; Creswell and Plano Clark, 2011). This perspective is described by Greene (2007, p. 79) as taking a 'dialectical stance' in which different paradigms can be used together respectfully and intentionally. This stance rejects the 'incompatibility thesis' (Howe, 1988; p.10), which states that it is inappropriate to mix qualitative and qualitative methods due to their fundamental paradigmatic differences.

The first two research objectives in this study were hypothesis testing and sought to identify the impact of a training intervention in MI on measurable physiotherapist outcomes through a quasi-experimental design. This deductive approach and the methods selected are consistent with a post-positivist worldview. In relation to the first objective, evidence has been presented in section 2.4.4 which underlines the impact and importance of the beliefs and attitudes of physiotherapists in relation to persistent LBP management, and that reliable and valid quantitative measures exist to evaluate the impact of training interventions on practitioner attitudes and beliefs. In this case the proposed training intervention was a training programme in MI.

The second objective was to determine the impact of the MI training programme on direct measures of MI competence or MI-consistent behaviours using validated

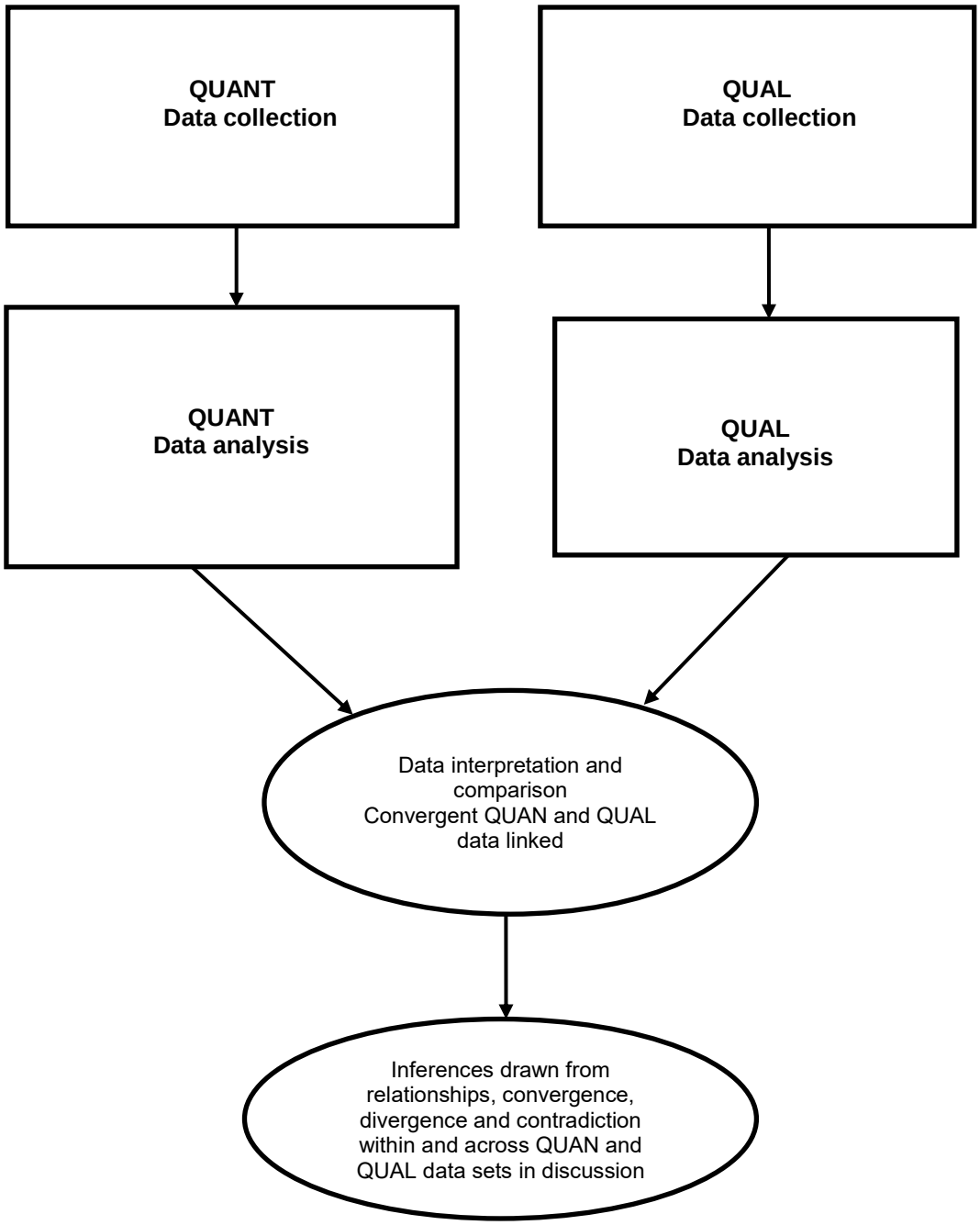
quantitative measures. The use of quantitative measurements for MI can also facilitate benchmarking against proficiency thresholds where these exist, and comparison with other professional groups and contexts.

As outlined in section 2.3, physiotherapists' use of MI in practice is relatively under-researched. As a result, the processes by which MI skills are developed and incorporated into physiotherapists' practice are not well understood. Research objective three therefore sought to explore and identify how physiotherapists developed, used and transferred their knowledge and skills developed from MI training into practice. Exploration of the experiences and perceptions of physiotherapists is most appropriately elicited through qualitative methods of data collection. This information can then be used to help inform future training for physiotherapists in MI and further MI research involving physiotherapists and their patients.

The use of both quantitative and qualitative approaches to data collection and analysis in this study permitted different but complementary insights by bringing together the data sets. The design of this study can be defined as a convergent parallel design which involves collecting and analysing two independent strands of qualitative and quantitative data in a single phase, and then bringing together the two data strands to look for divergence, convergence, relationships and contradictions within and between the two data sets (Creswell and Plano Clark, 2011; Wittink *et al*, 2006). A diagrammatic representation of the study design is provided in Figure 3.1.

The two data collection methods were given equal priority: that is both qualitative and quantitative approaches played an equally important role in addressing the overarching research aim. The linking of the data from the separate analyses allowed inferences to be drawn as the basis for discussion of the findings (Creswell and Plano Clark, 2011).

Figure 3.1: Convergent parallel design (Creswell and Plano Clark, 2011)



Key: *QUAL, qualitative, QUAN, quantitative,*

3.1.3 Theories, models and concepts underpinning the MI training programme

Several theories, models and concepts were used to underpin and inform the approach taken in the development and delivery of the MI physiotherapist training programme, relating mainly to the fields of adult learning and behaviour change. In the context of a short course in MI with extended supervisory oversight over a six-month period, the researcher considered theories, models and concepts which informed the initial training programme as well as the overall learning experience for the participating physiotherapists. In line with the main theorists of social constructivism, the training was planned to provide an interactive and inclusive learning experience (Vygotsky, 2012; Bruner, 1960). Due to the likely challenges to be faced in learning MI by a group assumed to be largely biomedically-focused, it was important to recognise the differing worldviews and experiences of individual physiotherapists. Unless these worldviews could be elicited and discussed, engagement with the learning could have been problematic.

The main theoretical considerations were the Self-determination Theory (SDT) and the Theory of Planned Behaviour (TPB) as outlined below. The SDT links behaviour change to concepts of intrinsic and extrinsic motivation (Deci and Ryan, 2002; Ryan and Deci, 2000). In the context of the initial training programme it was important to promote the autonomy of the physiotherapist in using and applying MI; indeed, it was important to acknowledge that the decision of whether to use (or not use) MI may be guided by the physiotherapist's impression of its fit with their individual professional style. Feedback was provided during the initial training and the supervision sessions to enhance competence in MI; aspects of positive feedback were focused upon due to their role in enhancing an individual's perception of competence and as a result their intrinsic motivation (Ryan and Deci, 2000). It was also important to promote positive interaction with others (peers, patients, researcher), to develop a supportive environment for learning and applying MI during the training programme.

The TPB (Ajzen, 1991) evolved from the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975) and proposed intention to act as the best predictor of behaviour. Intention is itself dependent on several factors including: the attitudes towards a behaviour; the expected outcomes of a behaviour; subjective norms as applied to a behaviour; and perceived behavioural control (in carrying out the behaviour). The

MI training programme elicited and challenged the beliefs and attitudes of the participating physiotherapists in a number of ways. These included presenting and discussing of the relevant evidence underpinning persistent LBP and MI, and a series of tasks, role plays and demonstrations during the MI training programme which utilised MI to model a person-centred approach as part of the patient-physiotherapist interaction.

The Health Belief Model (HBM) (Glanz *et al*, 2008) is a cognitive model which posits that behaviour is determined by beliefs about threats to an individual's well-being and the effectiveness and outcomes of particular actions or behaviours. Four main perceptions serve as constructs within this model including: perceived seriousness (of the illness / injury); perceived susceptibility (to illness or injury); perceived benefits (of the proposed behaviour); and perceived barriers (to implementing the behaviour). Although the HBM is normally applied to the beliefs and behaviours of patients, evidence has demonstrated that the beliefs and attitudes of health care practitioners are often biomedically-orientated and can impact their clinical behaviour, which may not always align with recommended clinical guidance (Darlow *et al*, 2012). In preparing the MI training programme it was recognised that the role of the HBM constructs of perceived seriousness and perceived benefits in relation to persistent LBP may have an impact on the participant physiotherapists' practice. Therefore, in delivering the programme, the trainers were aware and responded to any beliefs which were elicited which appeared to be at odds with current evidence and recommended practice. These were discussed with wider group and / or the individual as appropriate in an attempt to explore and develop their reasoning as the programme progressed.

The stages of change component of the transtheoretical model of change (TTM; Prochaska and DiClemente, 1982) relates behaviour change along a continuum of a state of readiness to change. Although the stages of change component is commonly applied in association with MI, it is the application of readiness to change to the participant physiotherapist which is of interest in the MI training programme delivery. The language and behaviour of the participants may indicate their readiness to change their practice behaviour during the initial training course and thereafter.

Self-efficacy, a concept describing a set of beliefs about one's ability to carry out a specific behaviour or task in a particular environment (Bandura, 1977; 1989), and

based on Social Cognitive Theory (Levin *et al*, 2001) is also referred to in section 1.4 as a defining feature of MI. Within the context of the training programme, the participants confidence and competence in executing MI was developed and guided flexibly, according to the skill levels demonstrated during the programme so that expectations placed upon them remained achievable. Modelling of MI through demonstrations, videos and role play to scaffolding learning and skills development (Bruner, 1960). Accurate and honest feedback was provided during sessions to allow participants to develop their skills.

3.2 Study site

The site selected for the study was an NHS Adult Community Trust in London. The Musculoskeletal Physiotherapy Service within the Trust is delivered across two Boroughs. The Service is managed and delivered separately within each Borough. Most of the physiotherapists in the Musculoskeletal Service are based in the main Physiotherapy Departments within each Borough. There are also several outreach clinics across the Trust located in primary care settings.

There were multiple reasons for this choice of site. First, the location of the site was close to the researcher's place of work: this allowed a manageable and convenient base for the delivery of the study. Second, as a large Adult Community Trust the site employed enough eligible physiotherapists. Finally, the manager of one of the Physiotherapy Services was known to the researcher and was amenable to facilitating access to the site.

3.3 Study participants

3.3.1 Physiotherapy participants

A letter was emailed by the researcher to the Musculoskeletal Physiotherapy Service Managers at each of two NHS Adult Community Physiotherapy Services within one NHS Trust in London (Appendix 2). The letter provided relevant details of the proposed study and a request for each manager to give permission for their physiotherapists to be approached to participate in the research. One of the Physiotherapy Service Managers agreed to this request and the other declined due to the current workload intensity within the Department. A follow up meeting was

held between the researcher and the Physiotherapy Manager of the participating Service in order for the Manager to be fully aware of the nature and commitment required by the physiotherapists within the Service.

At the commencement of the study design, sample size estimations for the MI training intervention were carried out based on literature reporting MI training on a group of medical students who had no previous training in this approach (Daeppen *et al*, 2012). The sample size calculation was conducted for the main outcome variable of MI Global Clinical Rating Score on the MITI 3.1.1. Lehr's formula (Campbell *et al*, 1995) was used to approximate the sample size required with power set at 0.80 (β=0.2), and significance level α (two-sided) set at 0.05, as follows:

$$\text{Sample size (per equal sized group)} = 16 \div (\text{standardised effect size})^2$$

$$\text{Where standardised effect size, d} = \frac{\mu 1 - \mu 2}{\text{Pooled standard deviation (SD)}}$$

And pooled SD was calculated as follows:

$$\sqrt{\frac{(n1-1)s1^2+(n2-1)s2^2}{n1+n2-2}}$$

With:

$\mu 1$ = experimental group mean (4.0), $\mu 2$ = control group mean (3.3)

n1= experimental group sample size (42), n2 = control group sample size (49)

s1 = experimental group SD (0.6), s2 = control group SD (0.6)

In this case, the mean difference was 0.7, and the pooled SD was 0.6. The standardised effect size was calculated as 1.17, with a projected sample size of 12 in each group. Since the numbers of physiotherapists eligible within the one Service appeared to be sufficient to satisfy the requirements of the study, with approximately 24 individuals eligible for recruitment, the researcher elected to proceed with one Service only. In addition, this sample size meant that it would be practically possible for a lone researcher to conduct the research in a limited time period.

Following the granting of ethical and research governance approval, the Physiotherapy Service Manager arranged for the researcher to meet with eligible

physiotherapists. To allow for the fact that all physiotherapists are based at one of two main sites, and several physiotherapists are part-time, three different volunteer recruitment meetings were arranged and attended by the researcher (June 9th, 10th and 16th, 2015). Two physiotherapists who were part-time and unable to attend the scheduled meetings were met with separately. Physiotherapist Participant Information Sheets (PIS; Appendix 3) and Consent Forms (Appendix 4) were given to all physiotherapists in attendance at the group and individual meetings.

At the meetings, a brief explanation of the study and the commitments required for participation were outlined. Physiotherapists were informed that they would be allocated to one of two groups, Group A or Group B. They were informed that Group A physiotherapists would be participants in the full six-month MI training programme which would include two days of initial training and monthly coaching sessions for six months. It was also explained that physiotherapists not allocated to Group A would be allocated to Group B, a comparison group for the purposes of this study. Participation in Group A would be determined by their availability for the initial two-day MI training course on a first come, first included basis. In order that they were also provided with a continuing professional development opportunity, Group B physiotherapists were informed that they would be offered MI training once the study data had all been gathered.

Physiotherapists were eligible for inclusion if they were employed by the NHS in the participating service and were willing to undertake the training programme. In addition, they were eligible if they had not previously undertaken formal training in MI, and as a result did not consider themselves proficient in this approach. Physiotherapists in both groups were asked to avoid undertaking any other training in MI during the course of the study.

In addition, physiotherapists were eligible if they considered that they would have sufficient patients in their caseload who were likely to fit the following criteria:

1. Aged 18 and over;
2. Low back pain, defined as pain and discomfort, localised below the costal margin and above the inferior gluteal folds, with or without leg pain (Burton *et al*, 2004);
3. Persistent low back pain: that is low back pain between six weeks' and twelve months' duration (Savigny *et al*, 2009);
4. Non-specific low back pain: that is low back pain which had no identifiable

cause.

Physiotherapists were excluded if they had participated in a formal MI training programme previously and as a result would consider themselves to be proficient in this. In addition, physiotherapists were excluded if they considered that they would have insufficient patients who fit the patient inclusion criteria, because patients in their caseload were predominantly or exclusively:

1. Less than 18 years of age, for example those with a large paediatric caseload
2. Did not have low back pain – for example those working with patients presenting with pain outside of the defined location such as knee or shoulder clinics
3. Did not have persistent low back pain – where pain had only been present for less than six weeks (such as those working in an acute referral setting only) or pain for greater than twelve months (such as for those physiotherapists who may work in a chronic pain unit which involving specific intervention by a multidisciplinary pain team);
4. The caseload had patients whose low back pain had an identifiable cause, for example pregnancy or a serious known or suspected spinal pathology. This would be the case for physiotherapists working in women's health, rheumatology clinics or with orthopaedic surgical cases.

Any queries raised by the physiotherapists were answered by the researcher in person at the recruitment meeting. Physiotherapists willing to participate in the research and who fulfilled the eligibility criteria were asked to complete and sign the consent form, which was countersigned by the researcher. All physiotherapists kept the copy of the PIS and a signed copy of the consent form. A signed copy of the consent form was also kept by the researcher. This had contact details of the researcher and physiotherapists were asked to get in contact if they had any additional queries.

3.3.2 Group allocation

Dates for delivery of the initial two-day MI training were agreed with the Physiotherapy Service Manager. Physiotherapists were allocated to Group A on a convenience basis – that is the physiotherapists who were available for the initial

two days of training were allocated to Group A. Physiotherapists were allocated to Group A on a first come, first included basis (by confirming their availability on the training dates). The initial aim was to recruit at least ten physiotherapists to each group. On this basis ten were allocated to Group A. The remaining physiotherapists were allocated to Group B. Group B physiotherapists were recruited to provide comparative data during the duration of the research. In doing so it was intended that this data would assist in identifying which changes in the Group A physiotherapists' attitudes, beliefs and behaviours may have occurred because of the MI training rather than through normal fluctuation, or as a consequence of other departmental training or other local initiatives that may have taken place during this period. The intention following group allocation was that the groups would be roughly the same size.

At the beginning of the study ten physiotherapists were recruited to Group A, and six to Group B. The reduction from the initial aim of 24 physiotherapists was caused by the high level of staff turnover. This impacted upon the number of physiotherapy staff available on a continuous basis to participate in the study over the six-month period. Due to the perceived high degree of ongoing commitment that would be required by Group A physiotherapists, and an assumption that the likelihood of drop out would be higher, the size of this group was maintained at ten. To increase the numbers in the study, the second Trust Physiotherapy Service was approached again to see if their physiotherapists may be able to participate, but the invitation was declined due to service issues and staff availability. Due to the length of time taken to get the study through ethical and research governance approval, and in the interests of progressing the study in a timely manner, a decision was taken by the researcher not to approach physiotherapy departments in another Trust to recruit additional physiotherapy participants.

3.3.3 Patient participants

Eligible patients were provided with a participant information sheet (Appendix 5) and asked to consent to the recording of an initial treatment session. Patient consent to be audio-recorded was gained by the physiotherapists directly and noted in the patient's treatment record. Consent forms were not used by the physiotherapists to avoid the need for confidential management and storage of these forms. It was made clear to the patient that the audio-recording was for training purposes only. In

addition, the patient was also made aware that:

1. The analysis of the recording was focused on the physiotherapist's contribution: the patient's verbal contribution during the session was only used to help rate the physiotherapist's responses;
2. The researcher would not be present at the physiotherapy session;
3. The patient's identity would not be made known to the research team who would be analysing the recording;
4. Patient consent would be gained by the physiotherapist, noted in treatment records and not disclosed to any other party;
5. The research team would not have access to the patient's treatment notes or medical records;
6. No details of the patient's treatment or medical condition would be requested or used in any way by the research team;
7. The audio-recording would be kept securely on a password protected computer and deleted once the doctoral thesis had been examined.

To provide a baseline for comparison in determining the outcome of the MI training programme in a clinical environment, physiotherapists were asked to record sessions with patients who fit the criteria outlined in section 3.3.1. These criteria focused on patients who had persistent, non-specific LBP. The rationale for utilising the Savigny *et al* (2009) definition of persistent LBP was to increase the likelihood of involving patients whose pain had been present for some time and who may be more likely to demonstrate a more complex presentation and / or greater obstacles to recovery, especially regarding psychosocial factors. In order to work with such patients successfully, it has been recognised that it is desirable for physiotherapists to possess higher level psychologically informed intervention techniques which can be incorporated into their practice, such as motivational interviewing skills (Foster and Delitto, 2011).

In addition, all participating physiotherapists were asked to exclude patients for audio-recording who:

1. Had known or suspected psychiatric or psychological disorders, since this would be recognised as requiring intervention by specialist mental health professionals (Main *et al*, 2005);
2. Were unable to understand English adequately, for instance a patient who required the services of a third party for communication (such as an interpreter) since this was likely to impact engagement with communication

styles such as MI.

As part of standard data collection processes in the Trust and as required by the Any Qualified Provider (AQP) Commissioners, patients presenting to the musculoskeletal physiotherapy service were routinely asked to complete the nine-item STarT BST (Keele University, 2007). The scores and sub-scores generated by this prognostic screening tool are intended to guide the nature and intensity of patient intervention in order to optimise value for money against predicted outcomes (Hill *et al*, 2011). According to this stratified approach, patients with a score of four or more are considered to be medium or high risk, meaning that they would normally require longer and more involved management. The aims of medium risk intervention are to restore function, minimise disability and to support appropriate self-management. For patients stratified as high-risk treatment aims are to reduce pain, reduce disability and improve psychological functioning in order to overcome barriers to recovery.

For the purposes of this study, and where the STarT BST had been completed prior to patient assessment, participating physiotherapists were recommended to select for audio-recording those patients who were medium or high risk (with a score of four or more). This additional guidance was not prescriptive, but it was assumed that it would assist the physiotherapy participants in identifying patients for whom a more psychologically informed approach may be indicated.

3.4 Interventions

3.4.1 Group A Intervention: The MI Training Programme

A bespoke programme was developed for Group A physiotherapists. The aim of the programme was to provide participants with a framework for MI practice, while at the same time ensuring that the content and structure would meet the learning needs of musculoskeletal physiotherapy participants within their current setting.

MI theory and practice informed the content of the training and also the pedagogic approach utilised throughout the six-month training programme. The researcher and MI Trainer were guided by MI principles and skills, and aimed to provide a learning experience which was empathic, transparent and collaborative. The content and learning progression was guided by Miller and Moyers' (2006) eight stages of

learning MI framework.

Prior to planning the initial two-day training course, the researcher requested copies of patient assessment record sheet templates and the pre-assessment questionnaire used in the musculoskeletal service. A discussion took place between the Physiotherapy Service Manager and the researcher to familiarise the researcher with service information including patient attendance, referral and booking patterns and processes. This ensured that the course content related to the physiotherapists' experiences in practice across the Trust. It was noted for instance that patients were asked to attend physiotherapy ten minutes prior to the allocated assessment appointment in order to complete a pre-assessment questionnaire (Appendix 6). This provided patients with an opportunity to complete questions about their current problem, general health status, employment status, functional status, and physiotherapy goals as indicated by a patient-specific functional scale. This information was helpful in ensuring that the training could consider the entire patient episode including the information that was readily available to the physiotherapist both prior to and during the initial assessment. It was noted that referrals could be made from within the Trust and from Primary Care, including referral via a local AQP scheme for patients presenting to primary care with back pain.

3.4.2 Programme Delivery

3.4.2.1 Initial two-day training

The initial training for Group A consisted of two sequential days of training (July 22nd and 23rd 2015) for approximately 14 hours in total. The training was planned and delivered by the researcher, a musculoskeletal physiotherapist in association with an expert MI Trainer, who is also a public health and behaviour change consultant. The MI Trainer has been delivering training in MI for more than twelve years and regularly delivers training sessions to a range of health care professionals, including physiotherapists, general practitioners (GPs) and pharmacists as group training and individual supervision. She is an active member of the Motivational Interviewing Network of Trainers (MINT). This is an international special interest group of trainers in MI, who gain membership on satisfactory completion of an application process, which includes demonstrating proficiency in MI practice. An outline of the content of the two-day training course is provided in Appendix 7.

The two-day training course was delivered on site in the Trust's community physiotherapy departments (one day in each of two department sites). The locations were familiar to the participating physiotherapists and this helped to create an informal and comfortable training environment. All of the physiotherapists were known to each other.

3.4.2.2 Ongoing MI supervision sessions

Supervision sessions were provided monthly to Group A physiotherapists in the six months following the initial two-day training course. Where possible these were delivered to small groups of physiotherapists. Where this was not possible (due to leave, part-time working status, or absence) individuals received one-to-one supervision with the researcher. The researcher discussed and agreed an outline of the approach to the supervision session with the MINT trainer who co-delivered the initial two-day training and as a result had a good understanding of the ability and role of the physiotherapist participants.

At the beginning of the six-month supervision period, a schedule of supervision times was circulated to the physiotherapists working at the two main sites. It became evident prior to the first planned session that due to part-time working and infrequent checking of emails by the physiotherapists, not all physiotherapists were aware of the schedule and therefore had not booked out their diaries to be available. To facilitate and confirm supervision sessions in advance, and to ensure that appointments made fitted with the physiotherapists' schedules, the researcher visited the two main sites regularly. The researcher worked with either the Service Manager or a local physiotherapist directly at these times to block out time in the electronic diaries. Due to various periods of planned leave, absences and unavoidable public holiday breaks, attendance was not necessarily possible at regular monthly intervals. Supervision was therefore arranged on as regular a basis as possible, and the schedule was tweaked as much as possible to try and accommodate participant availability and absence. A schedule of the supervision sessions attended by each of the physiotherapists is provided in Appendix 8.

The supervision sessions were held at the physiotherapists' workplace and normally lasted between 45 minutes and an hour. The content of the sessions was guided by an MI Supervision Plan, which was updated between sessions. Activities were planned for each session based on feedback from participating physiotherapists

during the sessions about the challenges they were facing in implementing MI in practice. The sessions usually included a brief handout which provided a summary of background information or MI prompts. Although material was prepared prior to the supervision sessions, in the spirit of MI the sessions were collaborative and guided as appropriate by the needs of the physiotherapists. When the sessions were more participant-led, these tended to involve the discussion of case study examples generated by the physiotherapists. These discussions were used to highlight and share practice that had worked well, or conversely to discuss and explore aspects which remained challenging during attempts to embed MI into practice. An outline of the content of the supervision sessions is provided in Appendix 9.

It was originally intended that the physiotherapists would provide recordings monthly and that these could be used to provide feedback via the behaviour change coding index, a practitioner behaviour change measurement tool outlined previously in section 2.5.2 (BECCI; Lane *et al*, 2005). However, recordings with patients were only provided on one occasion by three physiotherapists and the request for additional recordings appeared to put the physiotherapists under undue stress. Thus, monthly recordings were not pursued actively. Instead of this, role play and other activities which allowed real-time feedback were incorporated into the supervision sessions more fully.

The researcher kept brief handwritten notes at each supervision session, outlining the key feedback points from physiotherapists on their use of MI, and noting any barriers and enablers to implementing MI as well as perceived areas for development. This information was used to plan future sessions and to inform the final interview guide. Excerpts from these notes are provided in Appendix 10.

Email was used as the main mode of communication with the physiotherapists in the study. Immediately following the initial two-day training, Group A physiotherapists were emailed copies of an MI Booklet outlining the main course content. They also received additional resources relevant to MI, including journal articles which outlined MI theory, MI evidence-base and the role of psychologically informed practice in physiotherapy. Additional resources relating to MI practice included electronic links to the following: the Motivational Interviewing Network of Trainers (MINT) website as a source of further information; a video lecture by Stephen Rollnick on MI (BMJ Learning, 2014); and links to relevant sections of the Chartered Society of

Physiotherapy website highlighting King's 's Fund Reports promoting the use of motivational interviewing as part of the 'putting patients first' agenda (Foot *et al,* 2014).

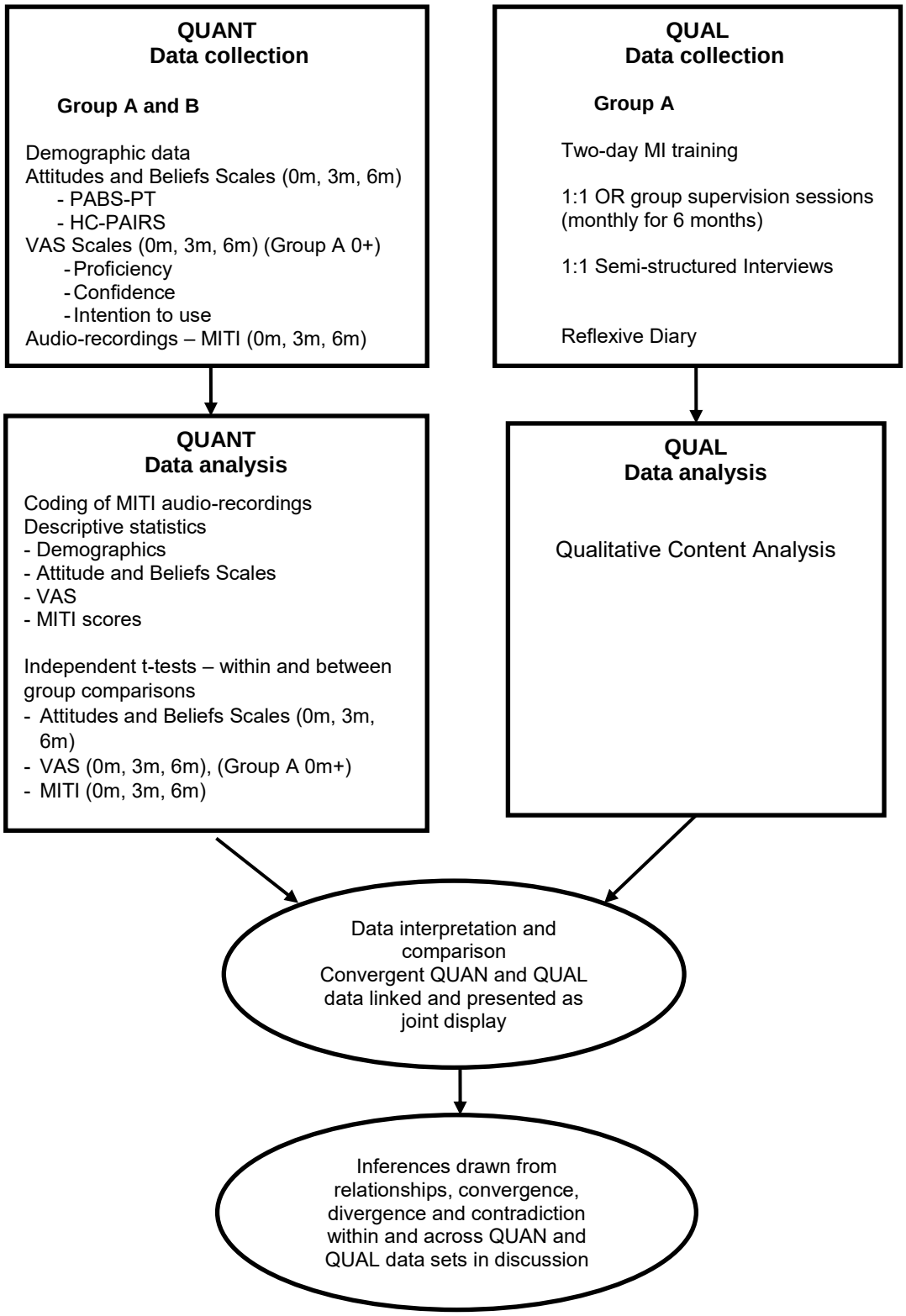
3.5 Data collection

A range of data was collected to address the study's research aim and objectives. A diagrammatic representation of the data collection points and tools used over the six-month period is provided in Table 3.2. The relationship between the different approaches and sets of quantitative and qualitative data collection methods and analysis, data set linking and interpretation within a convergent parallel design (Creswell and Plano Clark, 2011) is represented in Figure 3.2.

Table 3.2: Data collection points and tools

Activity	Data Collection Point / Participant Group																	
	Baseline		**Month 0 2-day training**		**Post 2-day training**		**Month 1**		**Month 2**		**Month 3**		**Month 4**		**Month 5**		**Month 6**	
	Group		**Group**		**Group**		**Group**		**Group**		**Group**		**Group**		**Group**		**Group**	
	A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**
Interventions																		
Two-day MI training			√															
Supervision							√		√		√		√		√		√	
Data Tools																		
Demographic questionnaire	√	√																
Attitudes and Beliefs Scales - PABS-PT - HC-PAIRS	√	√									√	√					√	√
VAS Scales - Proficiency - Confidence - Intention to use	√	√			√						√	√					√	√
Audio-recordings - Motivational Interviewing Treatment Integrity Scale (MITI)	√	√									√	√					√	√
Semi-structured Interviews																	√	

Figure 3.2: Data collection methods and analysis within convergent parallel design (Creswell and Plano Clark, 2011)



Key: *QUAL, qualitative, QUAN, quantitative, VAS, Visual analogue scales*
Attitudes and belief scales:
PABS-PT, Pain attitudes and beliefs scale for physiotherapists
HC-PAIRS, Health care providers' pain and relationship scale
MITI, Motivational interviewing treatment integrity scale
0m: baseline; 3m: 3 months, 6m: 6 months

3.5.1 Demographic data

All physiotherapists were asked to complete a demographic questionnaire providing details of their age, gender, number of years' post-qualification and relevant experience (Appendix 11).

3.5.2 Questionnaires to measure physiotherapists attitudes and beliefs regarding low back pain

The attitudes, beliefs and behaviours of the health care practitioner during treatment can influence patient beliefs, patient management and treatment outcome (Bishop *et al*, 2008). Clinician attitudes and beliefs about LBP appear therefore to be a potentially important predictor of clinician behaviour as discussed previously in section 2.4.4.1.

Physiotherapist attitudes and beliefs were assessed using two questionnaires: the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT; Houben *et al*, 2005b, Appendix 12); and the Health Care Providers Pain and Impairment Relationship Scale (HC-PAIRS; Rainville *et al*, 1995, Appendix 13). This selection of the measures arose from consideration of a range of measurement tools in section 2.4.4.2. Both questionnaires were completed by all physiotherapists at baseline and at a point three and six months following Group A training.

3.5.2.1 Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT)

The PABS-PT (Houben *et al*, 2005b) was developed to differentiate between two different treatment orientations, or attitudes, of physiotherapists in relation to non-specific 'chronic' LBP. It was based on two key treatment orientations reported in the persistent LBP literature, namely 'biomedical' and 'behavioural' orientations. Physiotherapists with a biomedical treatment orientation are considered to be more likely to manage the patient's reported pain by treating the physical pathology. In doing so they are said to use a more 'pain-contingent' approach to treatment. A higher score on the behavioural treatment orientation subscale denotes a more biopsychosocial approach to managing patients, and these physiotherapists would not necessarily consider pain as an indicator of pathology. Their approach to treatment would be focused on promoting functional activity as part of a 'time-contingent' treatment approach. The questionnaire consists of 19 items or

statements, with ten items referring to a biomedical treatment orientation and nine to a behavioural treatment orientation. Each physiotherapist in the study was asked to rate their level of agreement with each of the statements on a six-point Likert scale (with 0 representing totally disagree and 5 totally agree). The researcher checked each questionnaire following its completion to ensure that a rating had been made by the physiotherapist against all items.

The questionnaire generated the following two treatment orientation scores (or factors):

- score for the biomedical orientation (PABi) – calculated from the sum of scores for the following ten items: 3, 6, 8, 9, 10, 11, 12, 15, 16 and 19
- score for the behavioural orientation (PABe) – calculated from the sum of scores for the following nine items: 1, 2, 4, 5, 7, 13, 14, 17 and 18

3.5.2.2 Health Care Providers' Pain and Impairment Relationship Scale (HC-PAIRS)

The HC-PAIRS questionnaire (Rainville *et al*, 1995) was derived by altering the Pain and Impairment Relationship Scale (PAIRS) measured the attitudes and beliefs of health care practitioners about the relationship between 'chronic' LBP and functional impairment. The term 'chronic' here is considered equivalent to persistent LBP for the purpose of this study. The questionnaire generates a total score which indicates the degree to which those completing believe that persistent LBP justifies impairment and disability. A higher score indicates a higher level of agreement with this position. The original questionnaire is composed of 15 items, and four dimensions, although for the purposes of this study and in line with previous research dimension 4 (items 10 and 13) was not utilised and these two items were removed from the total HC-PAIRS score (Houben *et al*, 2004; Rainville *et al*, 1995).

Each physiotherapist in the study was asked to rate their level of agreement with each of items on a seven-point Likert scale from 1 (completely disagree) to 7 (completely agree). The researcher checked each questionnaire had been completed fully by each participant physiotherapist. The questionnaire generated the following scores:

- HC-PAIRS total score (sum of scores for items 1,2,3,4,5,6,7,8,9,11,12,14,15)
- HC-PAIRS dimension 1 score (sum of scores for items 1,2,3,6,7,8,9,11,12: functional expectations)
- HC-PAIRS dimension 2 score (sum of scores for items 5,7,11,14: social

expectations)

- HC-PAIRS dimension 3 score (sum of scores for items 4,9,15: need for cure)

3.5.3 Scales to measure physiotherapists' MI-related behaviour

3.5.3.1 Physiotherapists self-rated perceptions in relation to MI: Visual analogue scales (VAS)

It has been noted previously that the competence and confidence of physiotherapists is important in applying psychosocial interventions (Jeffrey and Foster, 2012). In addition, confidence in ability to change, readiness to change and importance of changing have been stated as factors associated with behaviour change (Michie *et al*, 2005). Practitioner readiness has also been proposed as important factor for implementing MI in practice (Barwick *et al*, 2012). These factors were measured in the study.

At baseline, all participating physiotherapists, in both groups A and B, were asked to complete three visual analogue scales (VAS; Appendix 14). Physiotherapists were asked to rate each of the following by indicating a position along a 100mm long line:

- current proficiency in using MI, between two points labelled 'Not at all proficient' to 'Highly proficient';
- current confidence in using MI with patients, between two points labelled 'Not at all confident' to 'Extremely confident';
- current intention to use MI with persistent low back pain patients in practice, between two points labelled 'No intention' to 'Every intention'.

The VAS measures were repeated following the two-day MI training course (end of day two) for Group A Physiotherapists, and at three and six months later for all physiotherapists in both groups. These self-rated measures provided an indication of physiotherapist perception of their intended and actual behaviour at key points during the six-month training period. This data allowed an analysis of any changes in individual and group physiotherapist perceptions compared with baseline measures. For Group A participants, this also provided comparative data between perceived and coded (actual) MI proficiency.

3.5.3.2 Audio-recording of patient consultations

All participating physiotherapists (Groups A and B) were asked to provide two audio-

recordings of initial physiotherapy assessments with persistent non-specific LBP patients at baseline.

In a session used to collect baseline questionnaires, each physiotherapist was allocated their own personally-labelled digital voice recorder (Sony ICD-PX333). All physiotherapists were trained by the researcher in how to operate the voice recorders. The physiotherapists were also provided with written information on operating the voice recorders, gaining and recording patient consent, patient selection guidance and a list of patient inclusion / exclusion criteria (Appendix 15). This training and information was provided approximately one month prior to the initial two-day training for Group A physiotherapists and therefore allowed all physiotherapists to complete the recordings prior to the MI training programme starting.

Other than needing to apply the inclusion and exclusion criteria, patient selection was at the discretion of each physiotherapist, and subject to patient consent. Physiotherapists were asked to provide recordings which were uninterrupted and that they felt best represented their practice. This meant that any recordings which were incomplete, interrupted or that the physiotherapist did not consider reasonably representative of their practice could be deleted and replaced as appropriate.

Physiotherapists from both Groups A and B were asked to provide another two audio-recordings three and six months later. These recordings were used to provide data for coding using the Motivational Interviewing Treatment Integrity Scale 3.1.1 (MITI; Moyers *et al*, 2010).

In order to facilitate feedback for physiotherapists, Group A physiotherapists were offered an opportunity to submit additional recordings for coding consideration at monthly supervision sessions. However, audio-recordings were provided by three physiotherapists prior to one session only. Some physiotherapists reported that they found this caused additional stress and since they were concerned they would have insufficient patients to fit the criteria to provide a recording as required. As a result, this approach was discontinued since it seemed unrealistic for the physiotherapists to provide recordings on a regular basis, to focus on providing feedback for a small number on a regular basis would be inequitable and potentially skew the data as a result.

When not in use, the digital recorders were stored in a secure location in the physiotherapy office. The physiotherapists notified the researcher when each set of recordings had been completed. The recorders were collected by the researcher as soon as possible following the completion of each set of recordings. These were transferred directly from the voice recorders onto password protected computer. Back up storage was provided on the researcher's workplace server.

3.5.4 Interviews to explore physiotherapists' experiences

The third objective of this mixed methods study was to explore Group A physiotherapists' experiences of transferring and using skills from MI training into practice. In line with the constructivist approach of this arm of the research, relevant qualitative data collection methods were considered to elicit and explore the experiences of the physiotherapists in using MI.

Face-to-face interviews on an individual basis were selected as an appropriate data collection method, given the relatively small number of participants, and a focus on gaining insight and understanding of individual participant experiences (DiCicco-Bloom and Crabtree, 2006). The use of group interviews and focus groups was considered; but there was no perceived advantage to be gained from group interaction in terms of answering the research question (Pope and Mays, 2006). In addition, the researcher was concerned that any unwillingness by the participants to disclose professional challenges to other close work colleagues would have lessened the depth of insight gained (Barbour, 2005).

Parker (2005) contends that qualitative research interviewing should be thought of as a continuum from completely structured to completely unstructured, and that extremes only exist in theory. He argues therefore that even the most unstructured interviews have a pre-determined question, and as such a structure of sorts. Semi-structured interviews are widely used in human and social sciences research (Brinkmann, 2018). A semi-structured research interview is defined as:

> *an interview with the purpose of obtaining descriptions of the life world of the interviewee in order to interpret the meaning of the described phenomena* (Brinkmann and Kvale, 2015, p. 6)

Semi-structured interviews allow the interviewer to focus the conversation on specific aspects which they feel are important in relation to the research, while allowing enough flexibility to follow-up aspects raised during the course of the interview considered important to the participant (Brinkmann, 2018). This approach is appropriate in the context of this study, since a focus was placed on eliciting the main barriers and enablers to putting MI into practice. At the same time, new and / or unknown areas of importance to the research could be discovered through the participant directing the conversation.

A draft interview guide (Appendix 16) was generated as part of the ethical approval submission to explore factors identified by previous researchers as barriers and enablers to implementing MI into clinical practice (Östlund *et al*, 2015b; Brobeck *et al*, 2011; Söderlund *et al*, 2008). The interview guide was updated to a minor extent as the study progressed to include aspects identified as important in the training, use and implementation of MI during the six-month training programme. An updated schedule indicating the additions to the original guide is provided in Appendix 17.

Approximately six months after the initial two-day MI training course, each Group A physiotherapist was asked to participate in a semi-structured interview by the researcher. The aim of the semi-structured interview was to explore the physiotherapist's experiences of transferring the MI training programme into clinical practice. All interviews were booked in advance with the physiotherapists and each lasted up to one hour. Each interview was conducted in a private space in the physiotherapist's workplace, normally in a private office or a gym space which was not being used by another clinician at the time. This was important so that the physiotherapist could not be overheard and therefore was able to speak freely about his or her experiences. This also ensured that the voice recording was of sufficient quality to facilitate accurate transcription.

Prior to participating in the interview, each physiotherapist was provided with a Participant Information Sheet (PIS, Appendix 18) and a brief verbal overview of the nature and role of the interview. Each physiotherapist was then asked to consent to being interviewed and audio-recorded using a digital voice recorder (Sony ICD-PX333), and to complete and sign a consent form (Appendix 19), which was countersigned by the researcher. The physiotherapist was given a copy of the PIS and a signed copy of the consent form. A signed copy of the consent form was also kept by the researcher. Following each interview, the audio-recording was

transferred directly from the voice recorder onto a password protected computer and backed-up on the researcher's workplace server.

All interviewees were asked via email if they wished to have an opportunity to comment on their interview transcripts prior to analysis of the data. None of the participating physiotherapists wished to pursue this option. If they had requested changes to the text, the suggested changes would have been discussed and agreed with the interviewee. The updated changes would have been incorporated into the analysis of the qualitative data.

3.6 Data analysis

This section provides detailed descriptions of the data analysis approaches and techniques utilised for each of the study data sets for the corresponding study aims. In line with the mixed methods approach used, this section will include information about analyses employed for traditionally quantitative and qualitative approaches, and in addition will describe the approach employed for connecting the data.

3.6.1 Statistical analysis of quantitative data

Where statistical tests were employed and in line with convention, a significance level of 5% was set (p-value less than 0.05). All statistical analyses were conducted using SPSS Statistics for Windows software package Version 21.0 (IBM, 2012).

Descriptive statistics were used across all quantitative data sets to provide numerical summaries of the data generated. Parametric t-tests were used for within and between group comparisons of quantitative data sets of the Health Care Providers' Pain and Impairment Relationship Scale (HC-PAIRS) and the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT). Controversy exists in the literature as to whether t-tests should be used for measurement tools which employ ordinal Likert-type scales, such as the PABS-PT and the HC-PAIRS used in this study, since Likert-scaled items represent ordinal data distributions (Carifio and Perla, 2008; Jamieson, 2004). However, statistical arguments have been put forward by several authors who contend that where researchers bring together ordinal items and sum them, there is an underlying assumption that the items are on an interval scale (Norman, 2010; Carifio and Perla, 2008). In the case of the PABS-

PT and HC-PAIRS, several Likert-scaled items were summed to generate scores. It was appropriate therefore to summarise the scores generated using means and standard deviations, and to analyse these as interval data using parametric statistical analyses, in this case t-tests.

Parametric methods are also considered to be superior when compared with rank (non-parametric) methods for small samples (Bland and Altman, 2009). T-tests and other parametric tests are robust to modest deviations from the test assumptions of normality, and to skewness of data. The reason for this is that for relatively small sample sizes, the means are usually approximately normally distributed regardless of the original distribution of the data (Norman, 2010). The use of small sample sizes is challenging in other ways, however, since the sample may not be fully representative of the population under scrutiny, and greater effect sizes will be required to reach levels of statistical significance.

Literature relating to the statistical analysis methods which should be used with data generated via VAS is similarly controversial. Some researchers have used non-parametric analyses considering the VAS to be an ordinal scale which must be analysis using non-parametric methods (Kersten *et al*, 2012; Svensson, 2001), while others have demonstrated VAS scales to have interval and ratio properties and have justified the use of parametric analysis methods on this basis (Myles *et al*, 1999; Dexter and Chestnut, 1995). For the purposes of this study, and given the robustness of parametric methods for small sample sizes, parametric paired and independent t-tests were used for comparative analyses of VAS within and between groups.

In the research literature, MITI global rating scores, MITI behaviour counts and their corresponding summary scores have been analysed using both parametric (Bohman *et al*, 2013; Maissi *et al*, 2011; Pierson *et al*, 2007) and non-parametric data analysis methods (Daeppen *et al*, 2012; Forsberg *et al*, 2008). It is possible to decide on the analysis method based on evidence of normality of data distribution the case in Bennett *et al'* s (2007) study of MI competence in health care workers, using test such as the Kolmogorov-Smirnov and Shapiro-Wilk; however, it is acknowledged that the power of these tests is relatively poor for small sample sizes (Razali and Wah, 2011). For the purposes of this study, the data was treated and reported as interval data, involving the use of parametric t-tests.

3.6.2. Demographic data

Descriptive statistics were used to provide summaries of physiotherapist characteristics within both Group A and Group B. A between group comparison of age, years since qualification and years in the specialism was carried out using independent t-tests (Armitage *et al*, 2008).

3.6.3 Physiotherapists' attitudes and beliefs regarding low back pain

3.6.3.1 Analysis of Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT)

Physiotherapists in this study rated their level of agreement with each statement of this 19-item scale using a six-point Likert rating scale (*totally disagree at 0* to *totally agree at 5*). The first three statements and the rating scale used in the PABS-PT are provided for illustrative purposes in Table 3.3.

The following scores were produced for each physiotherapist as follows:

- PABiS.PT biomedical treatment orientation score (sum of item scores for the following ten items: 3, 6, 8, 9, 10, 11, 12, 15, 16 and 19)
- PABeS.PT behavioural treatment orientation score (sum of scores for the following nine items: 1, 2, 4, 5, 7, 13, 14, 17 and 18)

Scores for both treatment orientations and for each physiotherapist were produced for baseline, three-month and six-month data points.

Table 3.3: Items 1 to 3 of PABS.PT

No	Statement	Level of disagreement / agreement (please circle)
1	Mental stress can cause back pain even in the absence of tissue damage	Totally disagree 0 1 2 3 4 5 Totally agree
2	The cause of back pain is unknown	Totally disagree 0 1 2 3 4 5 Totally agree
3	Pain is a nociceptive stimulus, indicating tissue damage	Totally disagree 0 1 2 3 4 5 Totally agree

Mean PABS-PT data at three and six months were compared with baseline data for Group A and B group using paired t-tests for PABiS.PT (biomedical treatment orientation score) and PABeS.PT (behavioural treatment orientation score). Inter-

group comparisons for data at baseline, three and six months were carried out for PABiS.PT and PABeS.PT using independent t-tests (Armitage *et al*, 2008).

3.6.3.2 Analysis of Health Care Providers Pain and Impairment Relationship Scale (HC-PAIRS)

Physiotherapists in this study rated their level of agreement with 13 items using a seven-point Likert scale from 1 (completely disagree) to 7 (completely agree) as illustrated in Table 3.4. The questionnaire generated the following scores:

- HC-PAIRS total score (sum of scores for items 1,2,3,4,5,6,7,8,9,11,12,14,15)
- HC-PAIRS dimension 1 score (sum of scores for items 1,2,3,6,7,8,9,11,12: functional expectations)
- HC-PAIRS dimension 2 score (sum of scores for items 5,7,11,14: social expectations)
- HC-PAIRS dimension 3 score (sum of scores for items 4,9,15: need for cure)

Table 3.4: Items 1-2 of HC-PAIRS

No	Statement
1	Chronic back pain patients can still be expected to fulfil work and family responsibilities despite pain. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree
2	An increase in pain is an indicator that a chronic back pain patient should stop what he is doing until the pain decreases. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree

Mean HC-PAIRS data at three and six months were compared with baseline data for Group A and B group using paired t-tests. Inter-group comparisons for data at baseline, three and six months were carried out using independent t-tests (Armitage *et al*, 2008).

3.6.4 Physiotherapists' MI behaviour in the clinical setting with persistent low back pain patients

3.6.4.1 Physiotherapists self-rated perceptions in relation to MI: Analysis of visual analogue scales (VAS)

The scores of the three visual analogue scales of current proficiency in using MI, current confidence in using MI with patients, and current intention to use MI with persistent LBP patients in practice were determined by measuring in millimetres from the left-hand end of the line to the point marked by the physiotherapist. The distance marked along the line was hand-measured in each case by the researcher using the same 300mm ruler to the nearest mm.

The VAS scale measures following training for Group A, and at three and six months for all physiotherapists were compared with baseline data within groups using paired t-tests. Inter-group comparisons at three and six months compared changes from baseline using independent t-tests.

3.6.4.2 Analysis of audio-recordings of patient assessment sessions using the Motivational Interviewing Treatment Integrity Scale (MITI) 3.1.1

The audio-recordings were coded using the Motivational Interviewing Treatment Integrity Scale 3.1.1 (MITI; Moyers *et al*, 2010). The MITI 3.1.1 consists of two components: a global rating on a Likert-type scale for five items, and behaviour counts of seven therapist behaviours. To optimise coding proficiency, the researcher undertook a period of MITI coding training (approximately 30 hours), using coded sample audio-recordings provided by the creators of the MITI. The researcher was also supported in the coding and had two telephone meetings with the MINT colleague who co-delivered the initial training, and who is an experienced MITI coder. In addition, the MINT trainer colleague was provided with two anonymised audio-recordings from the study to code. The researcher and the MINT trainer's coding were compared. The coding was largely consistent, and minor points of difference were discussed by telephone and used to develop the coding process. The coding training was carried out prior to final coding of all MITI recordings in August 2016.

As per the MITI guidance (Moyers *et al*, 2010), one 20-minute segment of an initial assessment session was coded for each physiotherapist at each data point. Since all recordings were longer than 20 minutes, the first 20 minutes of each recorded

assessment was coded. This decision was taken after analysis of a set of six recordings of the data at three months comparing the first and second 20-minute segments which highlighted the following:

- The second 20-minute segment was often more directive and less interactive, since this was the time during which the objective assessment was normally carried out;
- Following data analysis, no statistically-significant difference in the main MITI global scores between segments was observed;
- There were significantly higher numbers of behaviour counts noted in the first 20-minute segment as expected due to the subjective assessment. By focusing on the first 20-minute segment there would therefore be more scope to identify whether changes over time could be observed in this data.

In this case and due to the relative inexperience of the coder, two passes were used: pass one for the global scores and pass two for the behaviour counts. Global ratings were assigned after listening to the 20-minute audio-recorded segment. A sample of the scoring sheet used to record the MITI coding is provided in Appendix 20. Global ratings reflected the rater's overall judgment of practitioner performance on a 5-point Likert-type scale, from 1 (low) to 5 (high), for five dimensions: evocation; collaboration; autonomy/support; direction; and empathy. The average of the first three dimension ratings (evocation; collaboration; autonomy/support) constituted MI spirit.

During pass two of the 20-minute segment, behaviour counts were generated by counting the number of instances of the following therapist behaviours according to pre-specified categories and decision rules: giving information; MI adherent behaviors (MiA; e.g. asking permission before giving advice, affirming the client); MI non-adherent behaviors (MiNa; e.g. confronting or directing the client); closed and open questions; and simple and complex reflections. The behaviour count ran from the beginning of the segment being reviewed until the end.

A summary of the scores which are generated from MITI coding are presented in Table 3.5.

Table 3.5: MITI global ratings and behaviour counts

Global Ratings (scored 1 to 5)	Evocation
	Collaboration
	Autonomy-Support
	Direction
	Empathy
Global Spirit Rating	Scores for: (Evocation + Collaboration + Autonomy-Support) ÷ 3
Behaviour Counts	Total open questions (OQ)
	Total closed questions (CQ)
	Percentage open questions %OQ = OQ ÷ (OQ + CQ) x 100
	Complex reflections (CR)
	Simple reflections (SR)
	Total reflections (TR) = CR + SR
	Percentage complex reflections %CR = CR ÷ TR x 100
	Reflection to question ratio (R:Q) = TR ÷ (OQ + CQ)
	Total MI adherent (MiA)
	Total MI non-adherent (MiNa)
	Percentage MI adherent %MiA = MiA ÷ (MiA + MiNa) x 100

A descriptive analysis of the MITI data was carried out. Mean MITI ratings and behaviour count data at three and six months were compared with baseline data for Group A and B group using paired t-tests. Inter-group comparisons for data at baseline, three and six months were carried out using independent t-tests (Armitage *et al*, 2008). The data for global ratings and behaviour count percentages were compared with MITI proficiency scores for MI (Moyers *et al*, 2010).

3.6.5 Physiotherapists' experiences of transferring the skills developed during training in MI into a clinical setting

3.6.5.1 Qualitative analysis of semi-structured interviews

It is incumbent upon researchers to optimise research quality by ensuring consistency between the purpose of their research (research aim and objective) and the methods used to analyse the data. The level of interpretation required during data transformation is a key consideration, with more complex data interpretation associated with approaches such as grounded theory or hermeneutic phenomenology (Sandelowski and Barroso, 2003). Where less complex interpretation is required, more descriptive approaches such as content analysis or thematic analysis can be considered. Content analysis and thematic analysis are widely used within qualitative research due to their compatibility with a range of theoretical and epistemological approaches; however, these data analysis methods are poorly differentiated in the literature (Vaismoradi *et al*, 2013).

For this reason, researchers in the health care and social sciences fields have published papers to distinguish between the key characteristics and processes of thematic and content data analysis in some detail (Elo and Kyngäs, 2008; Braun and Clarke, 2006). Qualitative content analysis is defined as:

> *a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns.* (Hsieh and Shannon, 2005, p.1278)

Thematic analysis is defined as a 'method for identifying, analysing and reporting patterns (themes) within data" (Braun and Clarke, 2006, p.79).

In the context of this study, little is known to date about the use of MI by physiotherapists. Content analysis was selected as the most appropriate data analysis method to provide a focus on identifying, categorising and reporting issues raised by participants (Green and Thorogood, 2004), rather the reporting of a more nuanced interpretation across a data set provided through thematic analysis (Braun and Clarke, 2006).

Content analysis provides a technique for analysing the transcripts in a systematic manner (Krippendorff, 2012) through the structuring of unstructured data (Wood and

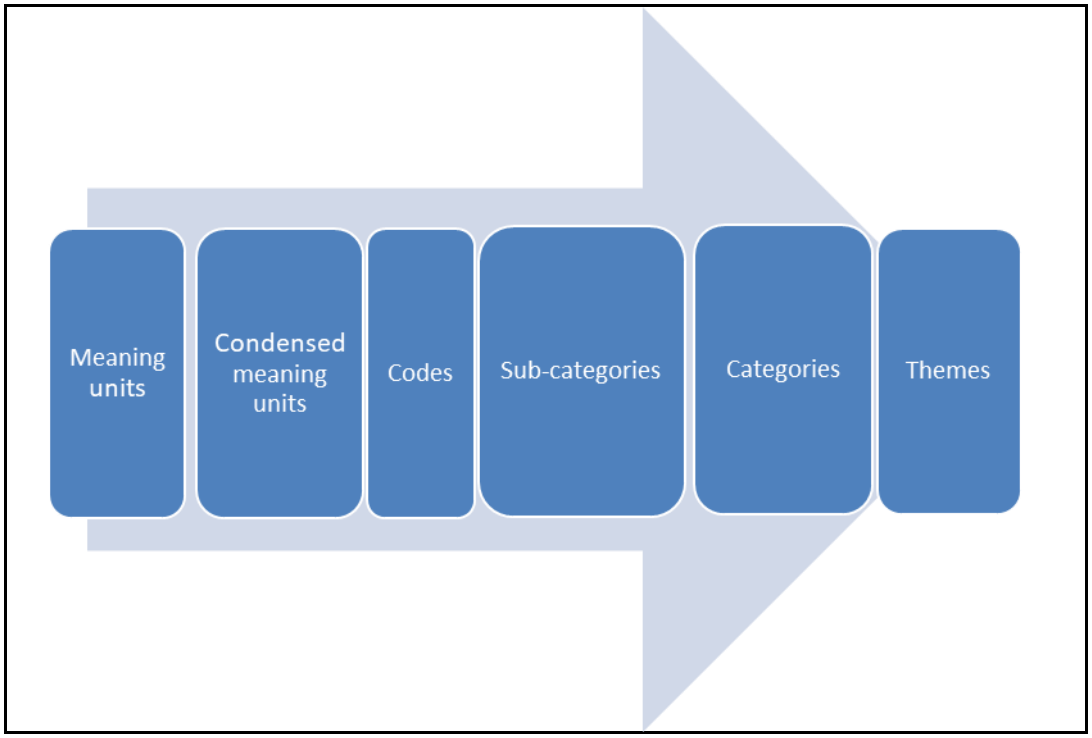
Ross-Kerr, 2011). The approach to content analysis used for the qualitative interview data in this study conforms to the description of conventional content analysis by Hsieh and Shannon (2005) which avoids the use of pre-conceived categories, and allows categories to emerge from the data inductively. The approach to qualitative content analysis was based on the processes used in an interview context by Graneheim and Lundman (2004) and represented diagrammatically in Figure 3.2.

All audio-recorded interviews with Group A physiotherapists were transcribed verbatim. The transcript of each participant's interview was formatted in a word document which was double-spaced. Page numbers and consecutive line numbers were added, and a wide margin was created on the right of the page.

A hard copy of each transcript was read while listening to the corresponding audio-recording. Text perceived by the researcher to be significant was highlighted. In doing so sentences or statements relating to the same meaning, also known as 'meaning units' (Graneheim and Lundman, 2004) were identified and highlighted. The transcript data for each participant were analysed in ascending order of the physiotherapist's participant number within the study (e.g. PT1, PT2, PT3 etc).

Meaning units were condensed into concise statements – or 'condensed meaning units'. These statements conveyed the core meaning of the text according to its context while reducing the size of the units of text in order to facilitate data analysis. The condensed meaning units were written down in the right-hand margin of each transcript.

Figure 3.3 Diagrammatic representation of qualitative content analysis stages in this study (Graneheim and Lundman, 2004)



The meaning units and condensed meaning units for each participant were transferred onto an Excel spreadsheet. This allowed the researcher to record the data to facilitate manipulation of it as the content analysis progressed. The meaning units and the related condensed meaning units were sequentially numbered in the Excel data sheet as data points in ascending order for each participant, starting at 1, 2, 3 etc. The line number corresponding to each meaning unit from the digital copy of the transcript was also recorded on the data sheet for future reference.

Each condensed meaning unit was abstracted and labelled with a code directly onto the Excel spreadsheet used for each participant (see Table 3.6). These codes provided a representation of the condensed meaning units from the researcher's perspective based on the content and context of the participant's experiences. Each code was assigned a number in sequence. New codes were generated as required as the analysis progressed through each participant's transcript where new material did not correspond to pre-existing codes. An extract from the data sheet of one participant demonstrating stages from meaning unit to code generation is provided in Appendix 21. Each code was recorded on a separate spreadsheet according to its

numerical sequence for reference and recording purposes. A brief description was written down for each code to provide consistency when applying the coding to the transcript data. Following the initial coding of all transcripts, the data sheets of all participants were collated into a large Excel spreadsheet, which facilitated further analysis of the data.

The codes were compared to identify similarities and differences. The codes were then clustered into subcategories via manipulation on the content analysis framework, based on their manifest content. Subcategories were then analysed based on their manifest content and clustered into a smaller number of categories. The use of categories is an essential feature of qualitative content analysis (Flick, 2014). This categorisation process was carried out iteratively, with each subcategory written on a paper strip to facilitate visual analysis and the manual clustering of subcategories into categories. According to Graneheim and Lundman (2004, p. 107), a category refers mainly to a ‘descriptive level of content and can thus be seen as an expression of the manifest content of the text’. Categories are expected to be mutually exclusive and exhaustive, although it is acknowledged that the categorisation of personal experience can make this challenging (Krippendorff, 1980).

Recurring threads of meaning through categories on an interpretative level were then identified as themes. Table 3.6 provides a sample of the content analysis process, demonstrating how the categories were generated and recorded in sequence (from left to right).

Table 3.6: Key processes involved in qualitative content analysis

PT No	Data point	Line	Meaning Unit	Condensed Meaning Unit	Code	Code no	Sub-Categories	Subcat No	Categories	Cat No
PT 3	102	488	And maybe you actually did give them a bit of what they wanted, and that kind of approach that they wanted they then just sort of calm down, or whatever's happened that day in their (life).	Maybe they were able to engage more as you gave them what they wanted	Managing patient resistance	68	OVERCOMING RESISTANCE	42	CHALLENGING PATIENTS	10
PT 4	31	147	the first one was a bit of hesitation. I think with everything once you've done one you feel a bit more I've done it completely wrong or lots of self-critique and a lot of looking back	when starting to use MI I was a bit hesitant to start with - you think youre getting it wrong and are very self-critical	Lacked confidence to start with	42	PROFESSIONAL CONFIDENCE	40	LEARNING JOURNEY	9
PT 7	81	536	Yes I think that would have helped me. I'm not someone that prefers to work in isolation. So I think that's why I like the team idea.	The team has been helpful for me - I prefer to work in a team than in isolation	Group support helped	4	WORK GROUP SUPPORT	32	BETTER TOGETHER	4

The qualitative data were emailed to two researchers experienced in content analysis and not involved in the study to provide external review, comment and verification of the coding process. Peer review is considered to be important in enhancing the reliability of content analysis, and less so in thematic analysis where the reviewer may not share the same subjective perspective as the researcher (Vaismoradi *et al*, 2013). Feedback was received from the reviewers which was followed up with discussion to achieve agreement about final coding and the production of subcategories, categories and themes.

3.6.6 Data gathering and analysis summary according to study aim and objectives

A summary table of the study aims and objectives, their corresponding data sets and data analyses is provided in Table 3.7.

Table 3.7: Data gathering and analysis summary

Study objective		Data Set	Analysis
1	To investigate the effects of a tailored training programme in MI on physiotherapists' attitudes and beliefs regarding LBP and its management	**Measures:** a/ Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT; Houben *et al*, 2005) – orientation scores b/ Health Care Providers Pain and Impairment Relationship Scale (HC-PAIRS; Rainville *et al*, 1995) – total and individual factor scores for Dimensions 1 to 3	Intra-group and inter-group comparison of scores at pre-intervention baseline, three months and six months' post-intervention **Tests:** Paired t-tests and independent t-tests
2	To investigate the effects of a tailored training programme in MI on physiotherapists' MI behaviour in the clinical setting with persistent LBP patients	**Measures:** a/ Self-reported proficiency, confidence and intention to practice (visual analogue scales) b/ Audio-recordings of patient-physiotherapist initial assessments - Motivational Interviewing Treatment Integrity Scale 3.1.1 (Moyers *et al*, 2010) Global Scores, Behaviour Counts	a/ Intra-group and inter-group comparison of scores at pre-intervention baseline, post two-day training (Group A only), and at three months and six months' post-intervention (Group A and B) **Tests**: Paired t-tests and independent t-tests b/ Intra-group and inter-group comparison of global scores and behaviour counts at baseline, three months and six months **Tests:** Paired t-tests and independent t-tests for global scores: Paired t-tests and independent t-tests for behaviour counts
3	To explore physiotherapists' experiences of transferring the skills developed during training in MI into a clinical setting	**Measure:** Audio-recordings of semi-structured interviews Transcribed semi-structured interviews	Interview transcription Qualitative content analysis adapted from Graneheim and Lundman (2004)
Study Aim			
To investigate the impact of a motivational interviewing training programme on the beliefs, attitudes, and practice of musculoskeletal physiotherapists managing persistent LBP		**Measure:** All quantitative and qualitative findings for group A physiotherapists	Data presented as joint display (Guetterman et al, 2015) Inferences drawn from data comparison throughout discussion.

3.7 Ethical and governance considerations and approval

3.7.1 NHS Research Ethics Committee (REC) approval considerations

In terms of NHS Research Ethics, the main ethical consideration this study was the extent of involvement of patients as participants in this study, and whether they would be identifiable. The patients would be users of the physiotherapy service in the NHS and seen by physiotherapists during assessment and treatment sessions. The non-standard elements were the recruitment of the patients by physiotherapists for the audio-recordings, and the attempts by the physiotherapists to use MI in the course of their practice, which is currently non-standard practice in UK musculoskeletal physiotherapy. There was clear intention in the methods that information that would identify patients would not be sought nor known to the research team. Several steps were taken as follows to protect patient identity as outlined previously in section 3.3.3.

As a result of ongoing discussions between the researcher and officers in the Research Management and Governance office and uncertainty as to whether this project should be submitted for NHS ethical approval, a query was submitted to the Health Research Authority. The outcome of this query (received 28th May 2014) advised that the study should be submitted for NHS ethical approval for the following reasons:

- that the audio-recording of physiotherapy assessments with patients represents patient participation in the study and through this the patients may be identifiable
- the MI intervention is not currently part of routine clinical practice and thus this research potentially subjected patients to a slightly different clinical intervention to that they would have otherwise received.

3.7.2 Ethical approvals

Ethical approval for this research was granted by the London South Bank University Research Ethics Committee in May 2014 reference: UREC 1407 (Appendix 22). As a result of the study having no material ethical issues (Health Research Authority; HRA, 2017) a submission containing all study documentation was made for Proportionate Review in December 2014 via the Integrated Research Application

System (IRAS – project ID 71363), and ethical approval was granted in December 2014 by the Proportionate Review Sub-Committee of the NRES Committee London-City and East (REC reference 14/LO/2274). Following a query by R and D colleagues, a revised NRES approval letter was received in May 2015 (Appendix 23). NHS Research Governance Assurance was granted by the Clinical Research Network: South London in May 2015 (R & D reference: NIRAS010; Appendix 24).

For the researcher to conduct the research study on site in the Adult Community Trust and subject to satisfying the Trust's procedures, an Honorary Contract of employment was provided for the researcher by the Trust's Human Resources Department.

All physiotherapy participants in the study, and the researcher, were registrants of the Health and Care Professions Council and as such were bound to follow The Standards of Proficiency for Physiotherapists (HCPC, 2013) and the Chartered Society of Physiotherapy Code of Members Professional Standards and Behaviour (CSP, 2011).

The research also followed the LSBU Code of Practice for Research Involving Human Participants (LSBU, 2016).

3.8 Qualitative data rigour and trustworthiness

The term rigour has a quantitative bias and its application in qualitative research is subject to debate (Rolfe, 2006; Morse *et al*, 2002). Several authors contend that concepts of reliability and validity can and should be applied across all qualitative research, regardless of its methodology (Morse *et al*, 2002; Davies and Dodd, 2002). It is inappropriate for the criteria used to judge quantitative research to be applied to qualitative research, and there is as yet no agreed consensus on quality criteria for qualitative work (Long and Johnson, 2000). It is argued that in order to demonstrate the rigour of qualitative work to the wider science community, legitimate criteria for judging quality needs to be identified (Tobin and Begley, 2004).

In the absence of a consensus position on quality criteria, Sandelowski (1993), supported by Rolfe (2006), argues that validity of qualitative work should be judged by the reader based on claims of trustworthiness put forward by the researcher. The

concept of trustworthiness most applicable to the qualitative arm of this mixed methods study is that described by Lincoln and Guba (1985) which aligns with a more constructivist paradigm.

Trustworthiness encompasses: credibility (paralleling internal validity; confidence in the truth of the findings), transferability (paralleling external validity; applicability to other contexts), dependability (paralleling reliability; consistency and reproducibility of findings) and confirmability (paralleling objectivity; extent to which the findings are shaped by the participants and not the researcher) (Guba and Lincoln, 1994; Lincoln and Guba, 1985). These elements are used to replace the criteria of rigour in the positivist paradigm of internal and external validity, reliability and objectivity Authenticity was later added as an addition criterion by the same authors (Guba and Lincoln, 1994). Proposed strategies for achieving and demonstrating trustworthiness have been provided by several authors (Elo *et al*, 2014; Morrow, 2005; Shenton, 2004; Lincoln and Guba, 1985). The steps taken within this research to address each of the trustworthiness criteria are described below.

Credibility was addressed through the following actions:

i. The researcher was engaged with and able to observe the group of participants within their work context and within the limits of the research over six months. This promoted the development of rapport and trust, and allowed the researcher to become more aware of local context and events which may impact upon the participants individually or collectively;
ii. Both qualitative and quantitative data were collected separately and brought together for comparison and interpretation as presented in section 3.1.2
iii. All participants were invited to review and comment upon their interview transcripts as a form of member checking.

Transferability was established by the following:

i. Sufficient description of process is provided in section 3.6.5 to enable other readers to assess the context, procedures and applicability to other settings.

Dependability was addressed within the study as follows:

i. The researcher undertook training in MITI coding prior to coding all of the MITI samples, and received coaching from the MINT trainer who was also an expert coder;

ii. The MINT trainer who co-delivered the MI training reviewed several coded MITI samples independently as a comparison, which were discussed with the researcher;
iii. All interviews were tape recorded and transcribed verbatim;
iv. The interviews were conducted by one interviewer to ensure consistency in the interview approach;
v. The initial content analysis was conducted by one researcher and reviewed and confirmed independently by two other researchers experienced in content analysis who were not involved in the study.

Confirmability was addressed through the following measures:

i. A reflexive log (Appendix 25) was kept by the researcher and brief notes were made during semi-structured interviews which assisted in the interpretation of meaning during analysis of interview data;
ii. The transformation of the data involved in the content analysis was recorded in a series of data sheets (Excel spreadsheets);
iii. A list of descriptions of the codes generated from the data to allow the processes fully transparent;
iv. The bringing together of data allowed for examination of the relationships, convergence, divergence and contradiction within and across datasets (section 3.6.5).

3.9 Summary

This chapter has provided a rationale for the mixed methods convergent parallel study design, based on the research problem, study aim and objectives. A detailed description of the study methods has been given, based on the justification provided by the critical review of literature in Chapter two. This description included methods relating to both the quantitative and qualitative approaches, and how these data sets would be brought together to achieve the research aim and objectives. In keeping with mixed methods research, interpreting and transforming data sets into a joint display has aimed to provide an enriched narrative understanding of the data through comparison and inference beyond that which may be achieved through a single methodological approach alone. Steps taken to establish the trustworthiness, rigour and credibility of the data were detailed. The study findings are presented in Chapter four.

Chapter 4 Results

4.1 Introduction

This chapter presents the key data and main findings in relation to the three research objectives of this study. The overall study aim is discussed as the data are compared and interpreted in Chapter five. Any findings related to the individual physiotherapists who participated in this study are anonymised, represented by their physiotherapist participant number, for example participant 1 will be PT1 and so on as appropriate.

The level of significance used to justify a claim of a statistically significant effect in this study, and in line with convention, is 0.05. Therefore, statistical significance will be claimed where $p < 0.05$.

4.2 Participant physiotherapist demographics

Sixteen physiotherapists volunteered to participate in the study. Ten were available to attend the initial MI training programme and were allocated to Group A. Fifteen physiotherapists completed the six-month study: nine in Group A and six in Group B. One participant withdrew from Group A following the initial training session but prior to the three-month follow-up. This withdrawal was because of a newly acquired musculoskeletal (MSK) condition which meant an adjustment in work role away from MSK care and therefore the participant was no longer able to fulfil the physiotherapist participant eligibility criteria.

The demographics of the participants who completed the study are presented by group in Table 4.1. The raw data is available in Appendix 26. As can be seen from the data, the participating physiotherapists were on average over 30 years of age, were experienced MSK practitioners and were established within their current roles. Two participants in Group A were male, with the remaining participants female. Group B physiotherapists were on average older, qualified longer, and had been in their current roles and MSK physiotherapy roles for a longer time. Group A comprised eight Band 6, one Band 7 and one Band 8 / MSK Extended Scope Practitioner physiotherapist, and Group B comprised two Band 7 and four Band 6 physiotherapists. Despite the differences observed between groups, the findings of

a between group comparison of mean age, mean years since qualification and mean years in the specialism using independent t-tests were non-significant. Therefore, participant characteristics of the two groups were comparable.

Although not accounted for within the group allocation process, Group A participants were based evenly across two main outpatient sites within the same Community Trust (five on one site, four on another). The opportunities for interaction with other participants and peer support through the programme was therefore similar across both sites. Group B participants were similarly based at both main sites (three at each site).

Table 4.1: Demographic characteristics of the physiotherapist participants by group

	Age (yr) Mean (SD) Range	Years qualified Mean (SD) Range	Years in current role Mean (SD) Range	Years in MSK role Mean (SD) Range
Group A (n=9)	33.5 (8.6) 23.5-48.7	9.4 (7.2) 2.0-24.0	3.5 (3.8) 0.1-10.8	6.1 (5.6) 1.0-18.0
Group B (n=6)	41.2 (7.4) 33.0-53.8	16.7 (9.1) 7.0-33.0	9.2 (6.7) 0.4-20.0	11.8 (7.5) 5.0-25.0
All PTs (n=15)	36.5 (8.7) 23.5-53.8	12.3 (8.5) 2.0-33.0	5.8 (5.7) 0.1-20.0	8.4 (6.8) 1.0-25.0

4.3 Effects of MI training on physiotherapists' attitudes and beliefs regarding low back pain and its management

The results reported in this section relate to the first study objective. The section focuses on the results of PABS-PT and HC-PAIRS scales completed by all participating physiotherapists. Details of the data analysis methods have been described fully in section 3.6.3.

4.3.1 Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) results

The PABS-PT scores generated by both Group A and Group B physiotherapists were compared at baseline (point 1) and at three months (point 2) and six months (point 3) following Group A training.

The 'biomedical' and 'behavioural' orientations of the physiotherapists were calculated from the total scores generated by the physiotherapists from their indicated level of agreement with 19 statements on a six-point Likert scale (with 0 representing totally disagree and 5 totally agree). In total, there were ten biomedical statements whose scores were summed to provide the biomedical score, and nine behavioural statements whose scores were summed to provide the behavioural score. PABS-PT mean scores by group and subscale are presented in Table 4.2 and mean differences in scores are presented in Table 4.3.

Group A and B mean subscale scores (shown to Table 4.2) were compared at baseline using a two-sample t-test. The hypotheses were:
H_0: The mean baseline score for group A and group B are equal
H_1: The mean baseline score for group A and group B are not equal
No statistically significant difference was noted for either the biomedical or the behavioural subscale scores.

Table 4.2: PABS-PT mean scores by group and subscale

PABS-PT Mean Scores (SD)	Biomedical Scores mean (SD)			Behavioural Scores mean (SD)		
	PABiS1	PABiS2	PABiS3	PABeS1	PABeS2	PABeS3
Group A (n=9)	25.2 (6.3)	20.1* (4.5)	18.3* (5.6)	29.2 (3.8)	31.0 (3.6)	32.6* (2.1)
Group B (n=6)	20.8 (5.8)	18.7 (4.5)	20.5 (4.9)	28.8 (3.8)	29.5 (0.8)	31.0 (2.1)
Total PTs N=15)	23.5 (6.3)	19.5 (4.4)	19.2 (5.3)	29.1 (3.6)	30.4 (2.9)	31.9 (2.2)

Key:
PABiS, biomedical orientation subscale scores (baseline [1],3 months [2] and 6 months [3])
PABeS,behavioural orientation subscale scores (baseline [1],3 months [2] and 6 months [3])
** denotes statistically significant within group differences in subscale score versus baseline (p value < 0.05)*

Changes in biomedical score (or behavioural score) within-group A (or B) at time 2 (or time 3) compared to baseline were tested using a paired t-test. An example of the hypotheses used for these tests is:
H_0: The mean change in biomedical score between baseline and time 2 for group A physiotherapists is zero.

H_1: The mean change in biomedical score between baseline and time 2 for group A physiotherapists is not zero.

As can be seen in Table 4.2, the PABS-PT biomedical subscale scores of Group A physiotherapists decreased significantly between baseline (PABiS1) and three months (PABiS2), with a mean difference of 5.1 (p=0.025), so the null hypothesis was rejected for group A. This statistically significant change was maintained and slightly larger at six months (PABiS3) with a mean score difference from baseline of 6.1 (p=0.007). There were small, non-significant changes in the biomedical subscale scores for Group B physiotherapists across the three data points, so the null hypothesis was not rejected.

In terms of the behavioural subscale scores (PABeS), indicating a more biopsychosocially-focused approach to LBP management, the mean scores for both groups of physiotherapists increased at both three and six months. However, only Group A scores reached a level of statistical significance at six months compared to baseline (PABeS3; p=0.030).

Thus statistically significant differences were demonstrated for Group A in both PABiS and PABeS scores over time compared to baseline scores. There was a decrease in biomedical orientation and an increase in behavioural orientation in group A, however, there was no significant change over time in either score for the Group B physiotherapists.

Table 4.3: PABS-PT mean difference by group and subscale

PABS-PT Mean Difference Scores	**Biomedical scores Mean difference (SD)**			**Behavioural Scores Mean difference (SD)**		
	PABiS1 to PABiS2	**PABiS1 to PABiS3**	**PABiS2 to PABiS3**	**PABeS1 to PABeS2**	**PABeS1 to PABeS3**	**PABeS2 to PABeS3**
Group A (n=9)	-5.1 (5.6)	**-6.9* (5.7)**	-1.8 (3.5)	1.8 (3.7)	3.3 (3.8)	1.6 (2.4)
Group B (n=6)	-2.2 (4.8)	-0.3 (3.6)	1.8 (2.8)	0.7 (3.5)	2.2 (2.6)	1.5 (2.0)

***Key**:*

PABiS,biomedical orientation subscale scores (baseline [1], 3 months [2] and 6 months [3])

PABeS,behavioural orientation subscale scores (baseline [1], 3 months [2] and 6 months [3])

** denotes statistically significant between group difference subscale score (p value < 0.05)*

The changes over time in biomedical score (or behavioural score) for group A and group B physiotherapists were compared using an independent samples t-test. An example of the hypotheses used (illustrated for the change in biomedical score between baseline and 3 months) is:
H_0: The mean change in biomedical score between baseline and time 2 for group A is equal to the mean change in biomedical score between baseline and time 2 for group B.
H_1: The mean change in biomedical score between baseline and time 2 for group A is not equal to the mean change in biomedical score between baseline and time 2 for group B.

As presented in Table 4.3, although reductions in biomedical subscale scores were larger in Group A compared with Group B, this only reached a level of statistical significance at six months (PABiS1 to PABiS3, p=0.047). Increases in behavioural subscale scores were higher in Group A than Group B but did not reach a level of statistical significance. The null hypothesis was only rejected for the biomedical subscale scores at six months.

Overall the physiotherapists in Group A demonstrated statistically significant changes in both biomedical (decreased) and behavioural (increased) orientation scores over the six-month period of the study, although compared with Group B scores, only the changes in biomedical subscale scores were statistically significant.

4.3.2 Health Care Providers Pain and Impairment Relationship Scale (HC-PAIRS) results

The HC-PAIRS scores generated by both Group A and Group B physiotherapists were compared at baseline (point 1) and at three months (point 2) and six months (point 3) following Group A training. The HC-PAIRS questionnaire generated a total score which indicates the degree to which participating physiotherapists believe that persistent LBP justifies impairment and disability (Rainville *et al*, 1995). A higher score indicates a higher level of agreement with this position. The questionnaire for dimensions 1 to 3 is composed of 13 items. Each physiotherapist in the study was asked to rate their level of agreement with each of the 13 items on a seven-point Likert scale from 1 (completely disagree) to 7 (completely agree). Mean scores for total HC-PAIRS and Dimensions 1 to 3 are presented in Table 4.4.

The baseline mean total HC-PAIRS score and the mean scores for Dimension 1 to 3 were compared for Group A and Group B physiotherapists using a two-sample t-test, there were no significant differences. Thus the scores for Group A and Group B are similar at baseline.

The changes in total HC-PAIRS (or dimension 1, 2 or 3 score) within-group A (or B) at time 2 (or time 3) compared to baseline were tested using a paired t-test. An example of the hypotheses used for these tests is:
H_0: The mean change in total HC-PAIRS score between baseline and time 2 for group A physiotherapists is zero.
H_1: The mean change in total HC-PAIRS score between baseline and time 2 for group A physiotherapists is not zero.

While the mean total scores for Group A decreased at three and six months, Group B scores had a minor decrease at three months but increased above baseline levels at six months. Overall a statistically significant decrease was observed only in Group A total mean scores at six months versus baseline (HCP3; p=0.024).

As shown in Table 4.4, Group A scores for Dimension 1 (functional expectations) and Dimension 2 (social expectations) also reduced at each of the data points at three months (HCP2) and six months (HCP3). Only the Group A Dimension 1 mean scores at six months demonstrated a statistically significant decrease compared to baseline (p=0.032). Group B Dimension 1 and 2 mean scores reduced slightly at three months (HCP2), and Dimension 3 score did not change; although scores for all Dimensions were higher at six months than at baseline. The findings represent a reduction of the degree to which Group A physiotherapists believed persistent LBP justified disability and impairment.

Table 4.4: HC-PAIRS mean scores (within-group differences)

HC-PAIRS Mean Scores	Total HCP mean scores (SD)			HCP Dimension 1 Mean scores (SD)			HCP Dimension 2 Mean scores (SD)			HCP Dimension 3 Mean scores (SD)		
	HCP1	**HCP2**	**HCP3**	**HCP1**	**HCP2**	**HCP3**	**HCP1**	**HCP2**	**HCP3**	**HCP1**	**HCP2**	**HCP3**
Group A (n=9)	39.2 (9.2)	34.8 (7.8)	**32.1*** (7.2)	26.2 (7.1)	22.7 (5.3)	**20.4*** 6.2)	11.6 (2.0)	11.4 (2.8)	10.4 (3.5)	9.8 (2.8)	8.3 (2.1)	8.7 (1.8)
Group B (n=6)	36.5 (5.5)	35.3 (4.5)	38.8 (5.3)	25.2 (4.5)	23.7 (2.8)	26.8 (3.8)	11.2 (2.9)	10.5 (1.9)	12.7 (2.2)	8.7 (2.0)	8.7 (2.9)	9.5 (1.8)
Total PTs (n=15)	38.1 (7.8)	35.0 (6.5)	34.8 (7.2)	25.8 (6.1)	23.1 (4.4)	23.0 (6.2)	11.4 (2.3)	11.1 (2.4)	11.3 (3.1)	9.3 (2.5)	8.5 (2.4)	9.0 (1.8)

Table 4.5: HC-PAIRS mean difference scores (between group differences)

HC-PAIRS Mean Difference Scores	Total HCP Mean difference scores (SD)			HCP Dimension 1 Mean difference scores (SD)			HCP Dimension 2 Mean difference scores (SD)			HCP Dimension 3 Mean difference scores (SD)		
	HCP1 to HCP2	**HCP1 to HCP3**	**HCP2 to HCP3**	**HCP1 to HCP2**	**HCP1 to HCP3**	**HCP2 to HCP3**	**HCP1 to HCP2**	**HCP1 to HCP3**	**HCP2 to HCP3**	**HCP1 to HCP2**	**HCP1 to HCP3**	**HCP2 to HCP3**
Group A (n=9)	-4.4 (6.7)	**-7.1** (7.3)**	**-2.7** (6.0)**	-3.6 (5.7)	**-5.8 ** (6.7)**	**-2.2** (4.8)**	-0.1 (1.9)	-1.1 (2.6)	-1.0 (2.9)	-1.4 (2.4)	**-1.1** (1.8)**	0.3 (2.1)
Group B (n=6)	-1.2 (5.4)	2.3 (5.0)	3.5 (3.4)	-1.5 (4.5)	1.7 (4.1)	3.2 (3.1)	-0.7 (2.7)	1.5 (2.3)	2.2 (2.8)	0.0 (2.2)	0.8 (1.5)	0.8 (1.6)

Key:

HCP (1,2,3), HCP-PAIRS scores at baseline (1), 3 months (2) and 6 months (3)

** denotes statistically significant within-group mean difference score (p value < 0.05)*

*** denotes statistically significant between group mean difference score (p value < 0.05)*

Dimension 1: functional expectations

Dimension 2: social expectations

Dimension 3: need for cure

HC-PAIRS mean difference scores are presented in Table 4.5. The changes over time in total HC-PAIRS score (or Dimension 1, 2 or 3 score) for group A and group B physiotherapists were compared using an independent samples t-test. An example of the hypotheses used (illustrated for the change in total HC-PAIRS between baseline and 3 months) is:

H_0: The mean change in total HC-PAIRS score between baseline and time 2 for group A is equal to the mean change in total HC-PAIRS score between baseline and time 2 for group B.

H_1: The mean change in total HC-PAIRS score between baseline and time 2 for group A is not equal to the mean change in total HC-PAIRS score between baseline and time 2 for group B.

There were statistically significantly larger decreases in Group A total HCP mean scores than Group B scores between baseline and six months (HCP1 and HCP3; p=0.016), and between three months and six months (HCP2 and HCP3; p=0.041). Correspondingly, Group A mean differences (decreases) were statistically significantly greater for Dimension 1 scores between baseline and six months (p=0.031), and between three months and six months (p=0.032), and for Dimension 3 scores between baseline and six months (p=0.044).

4.4 Effects of MI training on physiotherapists' MI behaviour

The results reported in this section relate to the second study objective. The section focuses on the results of self-reported VAS scores and the MITI ratings and scores generated by coding audio-recordings provided by participant physiotherapists. Details of the data analysis methods have been described fully in section 3.6.4.

4.4.1 Physiotherapists self-rated perceptions in relation to MI: Visual analogue scales (VAS)

The mean VAS scores at each data point for each of the groups (A and B) and across all participants are presented in Table 4.6. Mean differences in VAS scores, standard deviations and ranges at each data point are presented in Table 4.7. At baseline the self-rated proficiency (Prof), confidence (Conf) and intention to use MI (Intent) mean scores were all higher in Group B, but only the proficiency score was statistically significantly higher (p=0.04). Two individuals in this group reported

higher scores at baseline than participants across both groups. These scores are reflected in higher standard deviation values for Group B. The raw data for baseline VAS scores is available in Appendix 26.

At three months post-training (VAS2) and at six-months post training (VAS3) all mean VAS scores for Group A were statistically significantly higher than Group B scores.

The changes in VAS score (proficiency or self-confidence or intention to use) within-group A (or B) at time 1b (or time 2 or time 3) compared to baseline (time 1a) were tested using a paired t-test. An example of the hypotheses used for these tests is:
H_0: The mean change in VAS proficiency between time1a and time 2 for group A physiotherapists is zero.
H_1: The mean change in VAS proficiency between time1a and time 2 for group A physiotherapists is not zero.

As can be seen in Table 4.6, the following Group A VAS mean scores were all statistically significantly higher compared with baseline (VAS1a): immediately after the two-day course (VAS1b: Prof p=0.001; Conf p=0.001; Intent p=0.047); at three months (VAS2: Prof p=0.001; Conf p=0.001), and at six months (VAS3: Prof p=0.001; Conf p=0.001; Intent p=0.015). Only intention to use at three months failed to reach a level of statistical significance. For Group B mean difference VAS scores changed little over time compared with baseline, other than intention to use MI which was substantially lower at three (VAS2) and six months (VAS3), but was statistically significantly lower only at six months (p=0.028).

The changes over time in VAS score (proficiency or confidence or intention to use) for group A and group B physiotherapists were compared using an independent samples t-test. An example of the hypotheses used (illustrated for the change in VAS proficiency between baseline and 3 months) is:
H_0: The mean change in VAS proficiency between time 1a and time 2 for group A is equal to the mean change in VAS proficiency between time 1a and time 2 for group B.
H_1: The mean change in VAS proficiency between time 1a and time 2 for group A is not equal to the mean change in VAS proficiency between time 1a and time 2 for group B.

Table 4.6: VAS mean scores

VAS Mean (SD) Range	Prof VAS1a (SD) Range	Conf VAS1a (SD) Range	Intent VAS1a (SD) Range	Prof VAS1b (SD) Range	Conf VAS1b (SD) Range	Intent VAS1b (SD) Range	Prof VAS2 (SD) Range	Conf VAS2 (SD) Range	Intent VAS2 (SD) Range	Prof VAS3 (SD) Range	Conf VAS3 (SD) Range	Intent VAS3 (SD) Range
Group A (n=9)	3.1 (6.9) 0.0-21.0	4.0 (7.8) 0.0-23.0	61.2 (27.5) 22.0-100	**45.2* (10.2) 28.0-57.0**	**42.2* (19.2) 12.0-61.0**	**86.3* (10.5) 67.0-100**	**45.6* (15.5) 21.0-69.0**	**51.6* (10.6) 35.0-65.0**	**69.1 (14.6) 51.0-94.0**	**66.9* (8.0) 55.0-75.0**	**70.6* (7.4) 55.0-80.0**	**85.7* (12.3)** 65.0-100
Group B (n=6)	21.3 (23.4) 0.0-51.0	19.4 (20.3) 0.0-50.0	76.5 (25.4) 41.0-100	-	-	-	14.7 (18.0) 0.0-49.0	13.2 (18.6) 0.0-48.0	30.5 (28.1) 0.0-76.0	22.1 (26.2) 0.0-60.0	18.6 (21.6) 0.0-47.0	**22.2* (27.4) 0.0-65.0**
Total PTs (n=15)	10.4 (17.5) 0.0-51.0	10.2 (15.6) 0.0-50.0	67.3 (26.9) 22.0-100	-	-	-	33.2 (22.3) 0.0-69.0	36.2 (23.8) 0.0-65.0	53.7 (28.1) 0.0-94.0	49.0 (28.2) 0.0-75.0	49.8 (29.9) 0.0-80.0	60.3 (37.3) 0.0-100

Table 4.7: VAS mean difference scores by group

VAS mean diff (SD)	Prof VAS2-1a (SD)	Prof VAS3-1a (SD)	Prof VAS3-2 (SD)	Conf VAS2-1a (SD)	Conf VAS3-1a (SD)	Conf VAS3-2 (SD)	Intent VAS2-1a (SD)	Intent VAS3-1a (SD)	Intent VAS3-2 (SD)
Group A (n=9)	**42.5 * (14.3)**	**63.8 * (8.6)**	**21.3* (15.4)**	**47.6* (10.6)**	**66.6 * (6.7)**	**19.0* (13.8)**	7.9 (24.1)	**24.4* (23.6)**	**16.6* (11.8)**
Group B (n=6)	-6.6 (17.8)	0.9 (27.8)	7.5 (18.3)	-6.3 (12.0)	-0.9 (18.6)	5.4 (10.1)	-46.0 (44.1)	**-54.3* (43.3)**	-8.3 (21.8)
	**	**		**	**		**	****	****

Key: *VAS, Visual analogue scale*
Prof, self-reported proficiency in MI; Conf, self-reported confidence in using MI; Intent, self-reported intention to use MI
VAS1a, baseline; VAS1b (Group A only) post-training course; VAS2, three months; VAS3, six months
** denotes statistically significant within-group mean difference scores, p value < 0.05 (paired t-tests)*
*** denotes statistically significant between-group differences, p value < 0.05 (independent t-tests)*

As can be seen in Table 4.7, the following statistically significant mean difference scores were demonstrated in Group A scores compared with Group B across three data points: self-rated proficiency between three months and baseline (p=0.001), and six months and baseline (p=0.001); mean differences in self-rated confidence between three months and baseline (p=0.001), and at six months compared with baseline (p=0.001 respectively), and intention to use MI between baseline and three months (p=0.009), baseline and six months (p=0.001), and between three months and six months and (p=0.013 respectively). Thus it is concluded that self-rated proficiency, confidence and intention to use MI are significantly increased for a group of physiotherapists following MI training, but change little over the same time period for a group of physiotherapist who did not receive the training.

4.4.2 Motivational interviewing-consistent behaviour: MITI coding of patient-physiotherapist episodes

As outlined in the previous chapter (section 3.5.3.2), audio-recordings of initial physiotherapy assessments were provided by participating physiotherapists in both Groups A and B at three data points: prior to MI training programme starting (MITI1); three months later (MITI2); and six months' later (MITI3). All participants returned at least one audio-recording for each data point. On one occasion one participant provided two audio-recordings of patients with neck pain, who had been referred from primary care as 'back pain' patients. Following a review of these recordings, the researcher decided to include them in the study since the nature of the symptoms (other than location), and of the patient-therapist interaction was similar to that which may have been expected for persistent LBP patients.

Global ratings (Table 4.8, 4.9, 4.10) and behaviour count data (Table 4.11) have been generated from coding by the researcher of 20-minute segments of audio-recordings using the Motivational Interviewing Treatment Integrity Scale 3.1.1 (MITI; Moyers *et,* 2010). At baseline data across all global ratings were comparable between groups (Table 4.8, baseline data), with no statistically significant differences demonstrated between Group A and Group B using independent t-tests.

Table 4.8: MITI mean global ratings

Global Ratings	Global Ratings 1 (baseline)						Global Ratings 2 (3 months)						Global Ratings 3 (6 months)					
	Evoc1 (SD)	**Coll1 (SD)**	**Asup1 (SD)**	**Dir1 (SD)**	**Emp1 (SD)**	**Spir1 (SD)**	**Evoc2 (SD)**	**Coll2 (SD)**	**Asup2 (SD)**	**Dir2 (SD)**	**Emp2 (SD)**	**Spir2 (SD)**	**Evoc3 (SD)**	**Coll3 (SD)**	**Asup3 (SD)**	**Dir3 (SD)**	**Emp3 (SD)**	**Spir3 (SD)**
Group A (n=9)	2.3 (0.5)	2.9 (0.6)	3.2 (0.4)	3.7 (0.5)	3.7 (0.5)	2.8 (0.4)	**3.2* (0.8)**	**4.0* (0.5)**	**3.9* (0.6)**	4.0 (0.9)	4.2 (0.7)	**3.7* (0.5)**	**3.1* (0.8)**	**3.7* (0.9)**	**3.7* (0.5)**	3.7 (0.5)	3.8 (0.4)	**3.5* (0.7**)
Group B (n=6)	2.2 (0.4)	3.0 (0.6)	3.0 (0.0)	3.3 (0.8)	3.3 (0.5)	2.7 (0.3)	2.2 (0.4)	3.3 (0.8)	3.3 (0.8)	3.3 (1.0)	3.8 (0.8)	2.9 (0.6)	2.2 (0.4)	3.3 (0.5)	3.2 (0.4)	3.3 (0.5)	3.7 (0.5)	2.9 (0.4)
Total PTs (n=15)	2.3 (0.5)	2.9 (0.6)	3.1 (0.4)	3.5 (0.6)	3.5 (0.5)	2.8 (0.4)	2.8 (0.9)	3.7 (0.7)	3.7 (0.7)	3.7 (1.0)	4.1 (0.7)	3.4 (0.7)	2.7 (0.8)	3.5 (0.7)	3.5 (0.5)	3.5 (0.5)	3.7 (0.5)	3.2 (0.6)

Table 4.9: Mean differences in global ratings over time between groups

Global ratings mean differences	Evocation			Collaboration			Autonomy / support			Direction			Empathy			Global spirit		
	Evoc 2-1 (SD)	**Evoc 3-1 (SD)**	**Evoc 3-2 (SD)**	**Coll 2-1 (SD)**	**Coll 3-1 (SD)**	**Coll 3-2 (SD)**	**Asup 2-1 (SD)**	**Asup 3-1 (SD)**	**Asup 3-2 (SD)**	**Dir 2-1 (SD)**	**Dir 3-1 (SD)**	**Dir 3-2 (SD)**	**Emp 2-1 (SD)**	**Emp 3-1 (SD)**	**Emp 3-2 (SD)**	**Spir 2-1 (SD)**	**Spir 3-1 (SD)**	**Spir 3-2 (SD)**
Group A (n=9)	0.9 (1.1)	**0.8** (0.7)**	-0.1 (0.9)	**1.1** (0.6)**	0.8 (0.4)	-0.3 (0.9)	0.7 (0.5)	0.4 (0.5)	-0.2 (0.7)	0.3 (1.1)	0.0 (0.7)	-0.3 (0.7)	0.6 (0.9)	-0.1 (0.3)	-0.4 (0.7)	**0.9** (0.5)**	0.7 (0.4)	-0.2 (0.6)
Group B (n=6)	0.0 (0.0)	0.0 (0.6)	0.0 (0.6)	0.3 (0.5)	0.3 (0.8)	0.0 (1.1)	0.3 (0.8)	0.2 (0.4)	-0.2 (1.2)	0.0 (1.1)	0.0 (0.9)	0.0 (1.1)	0.5 (0.5)	0.3 (0.5)	-0.2 (1.0)	0.2 (0.3)	0.2 (0.6)	0.1 (0.9)

Key: *Evoc, evocation; Coll, collaboration; Asup, autonomy / support, Dir, direction; Emp empathy, Spir, global spirit rating*

** denotes statistically significant within-group differences versus baseline, p value < 0.05 (paired t-tests)*

*** denotes statistically significant between-group differences, p value < 0.05 (independent t-tests)*

The changes in mean global ratings (evocation or collaboration etc.) within-group A (or B) at time 2 (or time 3) compared to baseline (time 1) were tested using a paired t-test. An example of the hypotheses used for these tests is:
H_0: The mean change in global spirit between time1 and time 2 for group A physiotherapists is zero.
H_1: The mean change in global spirit between time1 and time 2 for group A physiotherapists is not zero.

Group A mean global ratings demonstrated statistically significant differences in the following dimensions and data points versus baseline, as shown in Table 4.8: evocation at three months (p=0.035) and six months (p=0.008); collaboration at three months (p=0.001) and six months (p=0.001); autonomy/support at three months (p=0.004) and six months (p=0.035); and global spirit at three months (p=0.001) and six months (p=0.002). No statistically significant global ratings were demonstrated for Group B over time.

The changes over time in global ratings (evocation or collaboration etc.) for group A and group B physiotherapists were compared using an independent samples t-test. An example of the hypotheses used (illustrated for the change in global spirit between baseline and 3 months) is:
H_0: The mean change in global spirit between time 1 and time 2 for group A is equal to the mean change in global spirit between time 1 and time 2 for group B.
H_1: The mean change in global spirit between time 1 and time 2 for group A is not equal to the mean change in global spirit between time 1 and time 2 for group B.

As shown in Table 4.9, statistically significant between-group mean differences over time (Group A and B) were demonstrated as follows: larger differences (increases) in evocation ratings in Group A at three months (p=0.035) and six months versus baseline (p=0.043); greater increases in collaboration ratings at three months versus baseline (p=0.020); and greater increases in global spirit ratings at three months versus baseline (p=0.011).

Individual global spirit ratings across the three data points are presented in Table 4.10. In comparison with the published levels of proficiency for MITI 3.1.1 by Moyers *et al* (2010), one participant in Group A exceeded beginning proficiency levels at baseline (global spirit of 3.5). Three physiotherapists in Group A exceeded beginning proficiency thresholds and three met or exceeded competency thresholds

(global spirit of 4) at three months and at six months. In Group B one participant exceeded beginning proficiency thresholds at three months, and another at six months.

Table 4.10: MITI Global spirit ratings by physiotherapist

PT	Group	Global 1	Global 2	Global 3
3	A	2.67	4.00*	4.00*
4	A	3.00	3.33	4.00*
5	A	2.33	3.67*	2.33
7	A	2.67	4.00*	3.00
9	A	2.67	4.33*	3.67*
10	A	2.33	2.67	2.67
12	A	3.67*	4.33*	4.33*
13	A	3.33	3.67*	3.67*
16	A	2.67	3.33	3.67*
1	B	2.67	2.67	2.67
2	B	3.33	3.67*	3.00
6	B	2.67	3.00	2.67
8	B	2.67	3.00	2.67
14	B	2.33	2.00	3.67*
15	B	2.67	3.33	2.67

Key: *PT, physiotherapist*
Global 1, Global spirit rating at baseline
Global 2, Global spirit rating at 3 months
Global 3, Global spirit rating at 6 months
**denotes global spirit ratings achieving baseline proficiency or above*

Table 4.11 presents the behaviour count summary scores resulting from the MITI coding. The summary scores consist of: % complex reflections; % open questions; R:Q (reflection: question) ratios; and % MIA (MI-adherent). Details of the calculation of these scores is provided in section 3.6.4.2, and in Table 3.4. A copy of the scoring sheet used to record the coding is provided in Appendix 20. The summary scores from the MITI behaviour counts are used as measures for determining competence in MI against threshold scores for beginning proficiency and competence (Table 4.11).

Table 4.11: Summary scores developed from MITI behaviour counts

MITI Scores	Behaviour Counts (SD)											
	% Complex Reflections (CR)			% Open Questions (OQ)			R:Q Ratios			% MI-adherent (MIA)		
	%CR1	%CR2	%CR3	%OQ1	%OQ2	%OQ3	R:Q1	R:Q2	R:Q3	%MIA1	%MIA2	%MIA3
Beginning Proficiency	**40%**			**50%**			**1**			**90%**		
Competency	**50%**			**70%**			**2**			**100%**		
Group A (n=9)	2.0 (4.0)	**11.0* (9.9)**	5.1 (6.9)	14.8 (6.0)	23.8 (12.0)	**25.3* (8.9)**	0.2 (0.1)	0.3 (0.2)	0.3 (0.2)	74.6 (43.3)	89.8 (17.6)	88.9 (33.3)
Group B (n=6)	1.0 (2.6)	2.8 (6.8)	0.0 (0.0)	17.9 (5.0)	15.0 (7.3)	19.7 (5.2)	0.2 (0.1)	0.3 (0.1)	0.2 (0.2)	84.7 (19.0)	83.3 (40.8)	100.0 0.0
All PTs	1.6 (3.4)	7.7 (9.5)	3.1 (5.8)	16.0 (5.7)	20.3 (11.0)	23.1 (7.9)	0.18 (0.08)	0.30 (0.17)	0.23 (0.15)	78.6 (35.0)	87.2 (28.0)	93.3 (25.8)

Key: *Baseline scores [1]: %CR1, %OQ1 etc, scores at 3 months [2]: %CR2, %OQ2 etc., scores at 6 months [3]: %CR3, %OQ3 etc.*

******* *denotes statistically significant within-group differences versus baseline, p value < 0.05 (paired t-tests)*

At baseline no statistically significant difference in mean was demonstrated between Group A and B for any of the summary scores. Although some increases in scores are demonstrated in both groups over time, the only aspect which reaches competency threshold levels is %MIA, although the baseline scores were already high and this percentage was derived in most cases from a very small number of behaviour counts.

The changes in summary scores (%complex reflections, %open questions, R:Q ratio, %MIA) within-group A (or B) at time 2 (or time 3) compared to baseline (time 1) were tested using a paired t-test. An example of the hypotheses used for these tests is:
H_0: The mean change in %complex reflections between time1 and time 2 for group A physiotherapists is zero.
H_1: The mean change in %complex reflections between time1 and time 2 for group A physiotherapists is not zero.

There was a trend for increasing scores over time for Group A, except for %CR which peaked at three months and reduced at six months. Statistically significant increases were demonstrated in Group A in the following mean scores: %CR at three months versus baseline (p=0.047) and %OQ at six months versus baseline (p=0.031). No statistically significant differences were found over time in Group B scores.

4.5 Physiotherapists' experiences of transferring the skills developed during training in MI into a clinical setting

The third study objective was to explore physiotherapists' experiences of transferring MI skills into practice. The data analysis methods which have been used for the qualitative data are outlined in section 3.6.5. Qualitative content analysis of semi-structured interview data from nine Group A physiotherapists generated 149 codes, 42 subcategories and 9 categories.
Three main themes were generated, representing recurring threads of meaning through the categories:

- Transformative learning journey
- Changing beliefs, roles and expectations
- Overcoming challenges

4.5.1 Themes

4.5.1.1 Theme One: Transformative learning journey

The physiotherapists who participated in the MI training programme described their learning experiences within an initial and ongoing learning journey. This journey began with undertaking the two-day MI training course and continued throughout the six-month programme. This learning journey was challenging cognitively and professionally.

Participants gave compelling descriptions of a sequence of experiences which led to them developing knowledge and skills in MI, and at the same time transform their approach to practice with persistent LBP patients. Notably this change was one which they appeared to embrace. Despite experiencing challenges in developing and using MI at the start of their journey due to their practice being 'fundamentally ingrained', participants were able to develop their MI skills through practice. By the end of their learning journey, they found that they could fit MI around their current practice to complement their personal style and approach in a natural way. They described changes in their practice which had become 'the new norm' which they felt they could not revert back from. The overarching sense within this theme is the ongoing professional transformation which led to the participants doing things differently in relation to their practice.

4.5.1.2 Theme Two: Changing beliefs, roles and expectations

The second theme is entitled changing beliefs, roles and expectations. Participants described, explained and reflected on the impact of MI training on their beliefs, attitudes, perceived role and practice, revealing an enhanced understanding of their capacity to work with patients in a more person-centred way, including patients they would perceive to be challenging. They described a change in their beliefs and attitudes about patients with LBP as a result of the training, which compelled them to work in a less directive and more collaborative way with their patients. There was a strong sense from the interviews that the new person-centred approach enabled them to use enhanced skills to engage more effectively with their patients' situations and concerns. These skills included an ability to listen more to their patients thus achieving a more accurate understanding of the patient's perspective. This resulted in greater patient empowerment within decision-making, so that patients left the session 'with their own choices'. The role played by participants in recognising

patient readiness, resistance and working with patients they perceive as challenging was significant to their practice.

4.5.1.3 Theme Three: Overcoming challenges

The final theme generated from the interview data is entitled overcoming challenges. Participants described several key challenges experienced during the MI training programme, particularly in relation to using their MI skills in their clinical practice and the language of MI. There was diverse range of factors and influences which were important drivers to keeping the participants interested and motivated to keep on track and improve their practice. The support from managers, supervisors and peers was highly regarded and recognised as a key factor in maintaining momentum within the training programme. Externally-provided support from the researcher through supervision and the pressure created by the need to provide audio-recordings at regular intervals were also identified as key prompts. Participants in this study described a real sense of commitment to MI. The practice of MI became easier to maintain when participants felt more comfortable in using MI and when MI had been incorporated into their own approach to practice.

Table 4.12: Themes, categories and subcategories from qualitative content analysis

Theme 1:	**Transformative learning journey**								
Theme 2:	**Changing Beliefs, Roles and Expectations**								
Theme 3:	**Overcoming Challenges**								
Categories	**Category 1** **Learning Experience**	**Category 2** **Learning Journey**	**Category 3** **Putting MI into practice**	**Category 4** **Physiotherapist role and identity**	**Category 5** **Person-centredness**	**Category 6** **Challenging patients**	**Category 7:** **Language and Communication**	**Category 8:** **Better Together**	**Category 9:** **Keeping on Track**
Sub-categories	Course content Course delivery Educational support	Learning new skills Developed toolkit Changing practice Learning through practice Professional confidence Personal journey Impact on participants	Adapting MI Patient readiness Patient selection Changed language Becoming automatic	Beliefs challenged Changing mindset Importance of communication Changed role	Engaging patients Listening to patients Sharing decision-making Meeting patient expectation	Recognising resistance Overcoming resistance Working with challenging patients	Changing the script Finding the words Aware of language	Work group support Peer motivation Sharing practice Manager support Local environment impact	Changing the routine Time pressure Prompting Practice Positive reinforcement Interested in subject Keen to learn Commitment to MI Supporting practice

4.5.2 Categories

4.5.2.1 Category 1: Learning experience

In terms of their learning experience, most of the participants shared in their interviews that the two-day course was thorough, relevant and provided sufficient content and grounding in MI skills. Some acknowledged that this was just the starting point, and the building blocks to go off and start practising the approach. The majority of participants found the course thought-provoking and challenging. They discussed finding it hard to process so much new information since MI was an unfamiliar approach to them.

> *I think at the time you kind of think well was that course a little bit full on over the two days. But when you almost step back away from it and look at it again you actually go, no actually that was really relevant. I think it was the right amount as well spread out over the two days to process. I definitely think it gave us the building blocks to kind of go out there and have a tinker with it to begin with and then build upon that. (PT 5)*

> *I found it was a lot of information to take on and it's really hard when it's a new concept to you. So although you sent us around research papers in advance, it's still a completely new concept. So I just wonder having a look back at it whether I lost some of that information because I wasn't able to process it as meaningful to me. (PT 12)*

> *Actually the training, the course, the idea of it, the concept – I got. (PT 13)*

The majority of participants described how having the initial training delivered over two consecutive days was useful to maintain momentum and have a full picture of how to apply the approach. Some of the participants described feeling uncertain about trying out a new approach when they had only part of the knowledge they needed and felt underequipped. There was a sense that trying something new without being adequately prepared may not work well and put them off.

> *I think like anything, partial knowledge sometimes is worse for your development than not having any cos you just think you know and then that either puts you off or just makes you over confident thinking that I'm doing it already so what's different. (PT 4)*

> *I think the danger of having it on a day and then leave it a week or two and then come back to it would be you'd potentially forget a bit of the groundwork that you've done in that first session and almost have to go over it again and would you then lose time at the end to go over other bits that you needed to go over. (PT 5)*

And I think that would be really difficult if you were only given a little bit of the information and then you'd be like oh I'm not sure where to go with this. Because I was kind of at that stage of uncertainty anyway. (PT 7)

It was however identified by some participants that a break between the two days of delivery would make the course less intense and allow time for some practice and skills development before day two. For these participants, there was a sense that having an opportunity to digest the information and get to grips with the basic skills of the approach would give them a better understanding of what was required and be able to participate more fully in the second day of training.

I think it would have been good if we'd done it maybe just a week between so then you could have assimilated that knowledge and taken it in and then maybe a bit of playing around with it and maybe done the follow up part to that….because obviously it was a lot to take in from that point of view. (PT9)

On reflection, I think if there's a choice for me personally it may be that doing it in two parts would have been more beneficial. Because there is a lot of information first of all to take in and its very intense over two days and inevitably you do get a little bit of brain freeze. Having the opportunity to go away and trial it means you can come back and talk about real life cases. That would sort of give you a sort of forum for getting tips and learning from others. (PT13)

Although the initial training course content appeared to provide appropriate baseline knowledge and skills, some participants reflected that tailoring it a physiotherapy-specific assessment framework and identifying key phrases for practice would have been useful.

Like the full thing I think would have been good. Because we did have kind of scenarios or case scenarios to work with which was really useful. But I think it would have been really nice to have actually tried to almost see how we could fit it into our assessment framework at that time. (PT 7)

You just want a phrase to say rather than trying to figure it out in your own brain to say, how am I going to word this. just to have that kind of question as to how you would word it and not have those closed questions that you weren't even aware of like the 'how are you today'. (PT 16).

In terms of the delivery of the programme and ongoing support, the majority of participants reported that the face-to-face supervision sessions were helpful to them, whether one-to-one or in a group. PT 5 highlighted the limitations of group only sessions.

I don't think one was more helpful than the other. They were both invaluable. I guess you can pull out different things. You can be a bit more focused on yourself in a one to one whereas as a group I think it's risky because you feel like if you've got a burning desire to talk about something you might be detracting away from what somebody else wants to talk about. (PT5)

PT 7 explained how group sessions had benefits, but that there may be value in moving to one-to-one sessions during the course of the programme.

Because your other team members would bring up things that you'd maybe thought about but had put at the back of your mind so it kind of reminded you of things that you were maybe unsure about and so that helped I think to have that. I think it was better with the one to one's as the time progressed because I think you'd got into your way of using it and putting it into your practice. Whereas at the start you're all in the same situation - it's all new to all of you. (PT7)

4.5.2.2 Category 2: Learning journey

The participants collectively described their experience as a journey within which they learned new skills, thereby developing their toolkit for working with patients whom they perceived as more challenging, and how over time they were able to change their practice. The experiences of the physiotherapists at the beginning of the journey were related to changing the way they approached their practice as well as the focus required to learn new skills. Both of these aspects were challenging for many physiotherapists, and were unsettling for some participants.

That thing we talked about, being rustled a little bit, and it could feel a little bit like something that's unknown. (PT3)

I felt it was very out of my comfort zone to begin with but now I don't think there's a different way of doing it. (PT5)

It's a bit tiring brain-wise when you try and take on something so new but all courses are like that. (PT16)

I think we're trying to obviously change fundamentally an approach that is ingrained into us. (PT13)

The participants shared with the interviewer that the learning undertaken allowed them to develop their skills and as a result expand their practice toolkit, especially in

the way they were able to work with patients they perceived to be challenging and complex. Participants justified the importance of this within their practice.

> *I think to be honest in order to manage a caseload in the NHS you need this type of communication tool. (PT 7)*
>
> *You can still see how it would help certain people that would have been the most problematic people on your caseload where you'd kind of look at their name on the appointment list and think, oh no. And you think you've got something else to tackle them with now and it's not going to be kind of these are your exercises and try them and see how you go. (PT16)*

The importance of practising skills during the learning process in order to change practice was described by several participants. They also recognised that skills can be lost when they are not reinforced and practised soon after the learning takes place.

> *But then I think that's all part of your learning, isn't it? I don't think that is all necessarily down to the MI, I think that is a natural thing that if any physio goes on a course, trying to implement what they have learnt on that course it's a natural kind of - it feels awkward at first but then the more you do it the more it becomes ingrained in your practice and feels natural. (PT 12)*
>
> *It's all fine going through it but if you don't practise it you forget it straight away. And it's hard to put it into practical context really. (PT 10)*
>
> *It's a really hard task because if you don't use it you lose it in a way. You really have to keep at it. (PT 4)*

Professional confidence of the participants appeared to play a role in changing their practice. Participants described their perceptions that higher confidence levels in practice, which they associated with greater experience, may make it easier for participants to try something new, especially when that meant moving away from traditional practice. This formed an important part of the learning journey, since there was a perception that more confident physiotherapists would not be too put off if things did not go well initially. Conversely, some participants described a sense of professional vulnerability and a lack of professional confidence in exposing their practice to scrutiny via audio-recordings as part of the research process.

> *I think it goes back to appreciating that you don't have to tick all these boxes in terms of treatment to be successful. Because you can actually get to a good place by just exploring things a bit more and that person could feel better by that whereas you haven't maybe done your sort of standard*

physiotherapy stuff when it comes to back pain. I think you get worried that if you don't include all of that, that you've not really done your job. (PT 7)

The sessions always feel a bit different when something is recorded because you feel very vulnerable that you listen to yourself and then the questions are coming because someone is going to listen. (PT 4)

Some participants described how the training programme affected them individually, describing a personal journey alongside practice development.

When you do those things there are certain things that you maybe just discover about yourself as well which I think was quite interesting as well. I'm still on that journey. (PT 3)

Every one of us has had our own different personal journey on it. (PT 12)

At the end of the training programme, participants described the impact on them as physiotherapists. They felt happier in their work and were better able to work with challenging patients. As a result, they felt less stressed and more positive in such situations. They discussed feeling less pressured and drained through working with patients, not against them, and empowering patients to play a more active role during the interaction.

I think overall it's been rewarding to do this. You get a buzz when someone gets better or engages more, and that's why I'm a physio. It's also good to see something work. I think because they are satisfied with their answer because they come up with it - that makes you feel happier as a therapist because you know they are going to be happier. (PT 9)

And at the end of a day when I have perhaps been doing solely the old approach I feel more tired and I feel drained because I'm the one that's just been giving, giving, giving. I feel that when I'm doing a little bit more of this it actually stops me feeling as if it's just me doing all of the work and the patient is taking on a little bit of responsibility. (PT 13)

It doesn't feel as hard to battle against people. It was kind of uplifting at the end rather than sometimes your chronic patients you're like 'right that was tiring'. That's why we came into the job, I want to help people, and if that's what you end up doing you feel better at the end of the day. (PT16)

4.5.2.3 Category 3: Putting MI into practice

This category describes participants sharing their differing experiences of putting MI into practice. Participants described adapting MI to fit their own practice over time,

and employing aspects of the MI approach more selectively and less rigidly in a way which suited their personal style and approach.

> *Using the questioning and the language is that initially you start off and it almost feels like you're using someone else's words...and you might adapt them a little bit or a slightly different tone or a slightly different time. (PT 3)*

> *It was quite staged to begin with but I think that's because I wanted to stick to the structure quite rigidly. Now I'm quite happy to kind of go on I would call it the scenic route rather than going down the direct route of it, and you're still using the skills but allowing it to flow better. (PT 5)*

> *And then it made me think as well that you can use it sort of when you need to. That it doesn't have to be for a specific type of patient or it doesn't have to just be every time. There's situations where only snippets will be relevant and then other situations where you'll use all of the aspects of it. (PT 7)*

> *I would like to do some further learning with it if I wanted to become proficient at it. I definitely want to but where I'm at now like mix and matching with bits and pieces I feel comfortable with that where I am now. (PT 9)*

Participants identified an ability to recognise patient readiness to change through working with an MI approach. They described an acceptance that a patient's state of readiness may guide the nature of their interaction with the patient, including reducing unwanted efforts to promote change as part of physiotherapy management.

> *It's reading the patient in front of you, kind of getting the vibe from them if they're ready to make that change or not. And then obviously using your MI to support that. I think it goes a bit hand in hand, rather than two separate entities. (PT 5)*

> *I didn't have to fish around for the change talk it was kind of, it was glaringly obvious she was at that point where she wanted to change. (PT 7)*

Participants also suggested that there was an element of selection of their patients for MI. In terms of recognising patients with whom MI may be appropriate, participants formed perceptions about their patients which shaped their decision to use MI. They found this process hard to describe but explained that their perceptions were often based on their impression of the patient early on during the initial interaction.

I mean you kind of start opening up with a patient and you can quickly see, you know, where you're going to be at the end of 45 minutes with a lot of patience once they start. (PT 3)

That you can tell those patients just from kind of that first couple of minutes you are going to do really well with MI and you can start to kind of bring it in and you can see, I think it's really cool when you can see those cogs kind of turning and turning and you can see them coming around, oh my God, I didn't realise I was capable of that. I think it's quite difficult to explain, and I don't know if anybody else gets that expression when they walk in and you're like 'you my friend you're going to be MI'ed' and you almost get excited like 'it's going to work'. (PT 5)

PT 13 reflected on how MI may help her to work with patients whose belief system did not align with her own.

I think in the background of my mind I'd be thinking that this approach is more about people whose beliefs systems are not in line with our belief systems. (PT 13)

Conversely, participants identified that patients who are compliant, not demonstrating ambivalence and ready to work with the physiotherapist, may not need an MI approach.

I have abandoned it a few times and just thought 'Oh God this is just too hard' where's they're just straightforward, just want the answer, don't want the chat, you know and just kind of come in and want to be out again. (PT 3)

Some of them come in and they just want to be told what to do. In which case that's fine. You just kind of swap what you're doing and say 'okay I think it would be good if you could try and do this many', 'if you're happy to do this' and then they'll say 'I'm really happy to do that'. (PT 10)

Only people that just don't need it really. People that know what physio is, it's maybe helped them before or it's helped someone they know. And they are just quite happy to just tell you everything and then they'll go 'right I'll just do whatever you want me to do'. (PT 16)

Although this research required the physiotherapists to audio-record sessions with persistent LBP patients, participants reflected that MI was indicated for use with a broader range of patients and they had implemented it within their practice more widely.

But I would want to stress that it's not just for chronic pain people because I think that's what I looked at initially and just thought, oh this technique can

only be used for that patient group. No, it's not actually, it can be used in lots of daily things. That's why I think it would be a useful tool for just general. (PT 7)

I have certainly used it with all my patients you know regardless of all conditions, which has been nice because that's cemented the MI approach so I am ready for those back pain patients I am doing the recordings for. (PT 12)

The importance of changing language when using MI in practice, and the use of MI becoming more natural and automatic was also identified by participants as an outcome of their learning journey. For some participants, an MI approach was considered a more permanent change which had become embedded in their practice, and that it would be hard to revert back to previous ways of working.

I think it is becoming a bit more of a natural process or natural communication style rather than a thought, a conscious effort. I think that bit, you know I think three quarters of the MI approach is completely natural to me now. (PT 12)

But I think it is getting there. It's changing and that's the new spiel now. (PT 16)

I think that there are some elements that I definitely won't revert back to and I'll always ask would you like me to tell you how this works? Or would you like me to give you an information leaflet? And I don't think that necessarily will regress back to how it was before. (PT 5)

Because it's been such a long process now, it'll definitely change overall now though cos it's kind of been reinforced so many times it's kind of stuck in the end which is good. I think you can't really change it now. (PT 10)

4.5.2.4 Category 4: Physiotherapist role and identity

The majority of participants described how undertaking the training gave them a greater understanding of the patient's perspective and challenged their beliefs about LBP patients. They explained how the training changed their way of thinking, and as a result has impacted their practice.

I think I'm a lot more understanding of peoples' situations and understanding of where they are in their head with regards to what's happening to them. So, my beliefs about people with chronic pain or back pain have definitely changed. (PT 5)

And because of the training, it does change your whole mindset I guess. Which changes all your assessments and things. (PT 10)

I think I believe that I feel differently now, now that I'm thinking about it and it isn't that I wouldn't have been concerned that the patient wasn't having a good experience, but now the shift I suppose is more about asking those questions. I don't know if I would have been thinking perhaps as much from the patient's point of view. But I think now I probably do think about it from their perspective and their point of view a bit more. (PT 13)

I think …this obviously gives you the opportunity to explore what's important to the patient and that's something that's definitely changed my attitudes. Again, previously it's been a case of let's fix the pain, let's get the pain better. And now it's a case of OK what does that patient want. Ask them what they wanted from it rather than trying to solve what I think is their problem. So from that point of view it has changed my beliefs. (PT 9)

Participants also highlighted the importance of communication within their role, although they recognised this as a potential skills gap, mainly from their initial professional education.

I've never really had any training in communication though that's what I do mainly in my job. If I can't communicate I can do whatever I want to do but it's still not going to work- whether that's with patients or staff. (PT 3)

Psychology's quite a big aspect really that I didn't really look at how you communicate with patients is really important. (PT 16)

Despite changing beliefs and attitudes, the recognition of pain as an experience which cannot be ignored as an indicator of significant pathology was highlighted by PT 4, reinforcing the biopsychosocial nature of physiotherapy practice.

But I still believe in there's lots of valuable reasons why someone is in pain and in need of investigation. It's very medical-model driven that you want to find out what's wrong with them and this has always been a priority (PT4)

The main difference within their role related to their perception of becoming more person-centred and holistic in their approach to care. They described this as taking on a more guiding role rather than directing or 'fixing' role with their patients, and letting the patient have their say:

It becomes less clinical doesn't it and clear cut. Not so much control but we sort of share that control I suppose. I still like to think that to some degree I've got to have the control because that's what I'm here for. But it's how much that tips over towards me and towards the patient as well. (PT 3)

Like I said before I think you assume that you are allowing people to openly talk about things, but for some reason they're not confident enough to do it, or maybe you've not given them that little gap where they can think oh I might say this now. (PT 16)

I think I always tried to be patient-centred, but actually implementing that is a different thing isn't it? Actually asking them what do you think is the problem, and why are you here? And how do you think you're going to make it better? It's different to just thinking I think this is the problem and I think this is how it's going to get better. (PT 10)

PT 7 expressed that her MI knowledge validated her approach in being less directive with the patient, which previously would have make her feel guilty for not delivering an intervention as requested by the referring clinician.

I could see how that approach could be really effective because you're aware that it's not just the physical symptoms that you're sort of dealing with. It is a package of care, a holistic approach. It's about looking at every aspect of their life and how they can change those things to make it better. If you can't get them to the point of seeing what might help them, sort of guiding them through that. Before you'd feel quite like you haven't done your job or feel guilty because you've had this referral from a doctor and you haven't really fulfilled what it's requested. (PT 7)

PT 13 identified that it was possible to revert to a more directive 'default' mode when not concentrating as hard on using MI.

It's my job perhaps as a physiotherapist to try and get them to be more responsible. You slip back to autopilot. I can feel myself doing it, because I go back to the sort of dictator you know - do your exercises three times a day. I'm aware of it; I'm very aware of it. (PT 13)

4.5.2.5 Category 5: Person-centredness

In addition to recognising that their role with patients was becoming more person-centred and less directive, the participants described several elements of more person-centred behaviour in their interaction with patients. Several participants identified changes in their nature and level of engagement with patients, which were perceived by participants as positive.

I think the engagement is different. So, I feel like I've had a conversation with that patient, rather than that sort of verbal diarrhoea kind of scenario. (PT 3)

So, I find that if I engage with them at the beginning I know that I have them and capture them. (PT 4)

I'm not saying it was completely non-collaborative, but I probably didn't engage with them as much as I have done more recently. So, absolutely I think that's been quite good from that point of view. (PT 12)

Participants also described how they listened to their patients more, and recognised that effective listening would provide them with information they would need to understand more fully the patient's situation and concerns. They also perceived that patients would appreciate being listened to.

I think I listen an awful lot more rather than going 'this is what I know'.

If you looked at does the patient feel that they have been listened to and their concerns taken on board? I think massively improved……I think I was quite 'nope we're doing it this way' before, now I'm very much more inclined to 'well, how do you want to change this? What would you like to do to make this better? Have you got any ideas'? (PT 5)

I think just talking to them and just to let them talk and rather than worrying if it's relevant things, just using that to let them guide it. (PT9)

Other participants highlighted the importance of listening to the patient and giving the patient an opportunity to express themselves, so that the physiotherapist would have a more accurate account of the patient's situation and perspective from the start of the interaction.

I probably really now ask the patient what do you want. So before jumping on the bandwagon right let's do this this and this, just say what do you actually want from that. I have had a couple of times people say I know my pain may not change but I want to be able to do that. (PT 9)

I think pausing and giving people a bit of time. I think sometimes I just want to get in there and just say 'right you're answering my question but I really need to go down this way' and I think the whole pausing and getting people to have just a couple of the minutes of thinking rather than them going home and thinking something different and then coming back and either saying it or just holding it back and not telling you because they think well that conversation's gone. (PT 16)

Participants described their feelings about the importance of sharing decision making with patients and collaborating more fully on the planning of the treatment programmes as part of person-centred practice.

I felt when they've walked out, they've walked out with their choices. (PT 3)

I feel that the patient goes away a lot more confident in your ability and the plan of action that you've made together and they feel that they have been part of it. (PT 5)

I get them to maybe tell me what it is they're going to do. I guess that's a similar thing once a person has said what their intentions or I've made them think about it or visualise it. Or it comes a bit more real for them in the reality I might even get to show me how they see it so I get them involved. (PT 13)

4.5.2.6 Category 6: Challenging patients

Another main finding in relation to person-centredness was a heightened awareness of the importance of identifying patients' expectations so that these can be met, at least in part, and managed effectively. There was also a recognition from participants that patients' expectations could only be managed through adequate exploration of their personal situation and their intended goals.

I think that what the patient needs is something to go away with. Feel that they've had something. Whatever that is, you know, a talk and a kind of clarification of things for the patient, or whether that's physically something that they're holding onto and walking out of the door with. (PT 3)

If you'd not maybe explored these things the person wouldn't be moved on in that situation…. Just the fact that everything's been explored and goals are being set and we're sort of on the right road. (PT 7)

I think there's always people that do come and they just think you're going to tell them what to do and they really give you odd looks when you ask certain questions about why are you here and what do you think the problem is. They kind of don't seem to think that they are part of the whole process of getting better and sorting out what is going on. Even though sometimes they say they don't have any expectations, but they expect either to be given some advice or some kind of exercise or been touched or assessed in some objective way. (PT 16)

Some participants identified the need to develop skills to work with patients they would consider difficult to manage, and that this was different to their standard role.

You know over a long period of time we have identified patients that are difficult to manage and we are not quite hitting the spot with even though we try and we share and all of that, but you know there is something missing with that. (PT 3)

I think it's sort of a mixture. Opportunity definitely but also the kind of always ongoing question, what do to do improve that quality of care and also improve your own ability to deal with the difficult questions and chronic scenarios. (PT 4)

Obviously there are certain things that are standard but I do think with certain types of patients our role should be different. Particularly with that (resistant) group of patients. (PT 7)

Participants recognised when they encountered challenging patients, and had mixed reactions to this. Some described abandoning attempts to use MI, and identified challenges associated with trying MI as a new skill.

I suppose I can think of ones that I've abandoned. Where you can kind of feel that, there's that kind of clear-cut and it's almost like they don't have the patience with me. You know and so I might be talking or trying to ask questions and they'll almost talk over you, or they're quick at coming back. Or they kind of close it down. (PT 3)

I think earlier on I think that would be quite hard to deal with I think you are trying something new and it's backfiring a little bit. If you just had resistant patient after resistant patient, that that would be quite draining like going back to work hard at something and you not getting anything back. (PT 16)

Many participants were positive and described some success using their MI skills to interact with challenging patients as part of their role, describing how this success reduced a sense of fear or dread in dealing with these patients.

I feel comfortable to ease off and then maybe try to wait when they're ready. So the dialogue before would be cut short to make sure that that's achieved. Now I just feel I can go even a whole session engaging with them until they feel they are ready and either they are or they're not, so I don't feel frightened of that longer journey. (PT 4)

You can hone in and you can use all the skills that you've got and it works very effectively. I think that the resistance can be addressed because you can ask the person to self-evaluate….it sounds quite harsh but that was the type of patient I thought in the past I'd never be able to well I suppose 'dance' with. And I thought you know it's the patient that I'd always sort of dread. (PT 7)

At the end if you can just see that they're not going to do it, just say well ok you know maybe even say 'I can see you're a little hesitant towards what I've told you there. What would you do to make you want to do this more?' It might be they would say less frequency or things like that. (PT 9)

4.5.2.7 Category 7: Language and communication

One of the main areas described as presenting a challenge was getting to grips with the language and communication skills required to work with MI. Participants explained that modifying the way they communicated with patients, the style of

which had for some changed little since University, was similar to changing a familiar script, and likened to breaking a long-term habit.

> *I think that sort of full package if you like. It's the whole way of thinking about how you communicate with a patient, changing my language because it's so embedded; what I say, how I speak to the patient. And silence. (PT 3)*

> *You get into habits and you get into a certain order and a process of doing things so it's almost like breaking that habit for the first few months really. (PT 7)*

> *Because when you come out of university I don't think it changed too much. In the years after that that you did your set questions and then even now our sheets have set questions that you learn at university as well. You just did them, and they just come they come out of your mouth quite easily. (PT 16)*

One of the hardest aspects in changing to a new way of communicating with the patients was the cognitive challenge of thinking about and processing the language they used, which they found hard and often tiring at first. PT 9 described trying the skills out with less resistant patients to start with and more challenging patients as the skills improve.

> *We have to really think about what we're saying. Because you're having to over think everything so it's quite tiring as well. You're trying to reword everything completely differently. (PT 10)*

> *Yeah because I think you had to work really hard in your brain while they were answering your last question, how I'm going to word the next question. And you think oh my god what did they say, and just to make sure I make a note of what they said and it was a lot of brainpower to try and make sure you're not leading down a different path and using closed questions. But it's very easy to do. (PT 16)*

> *But then I think as you get better you try it with a more challenging patient. Yes, just test the water and things like that with the ones that you think are not going to be as resistant. (PT 9)*

Overall the participants were more aware of the language they used, that they considered language important, and reflected that this level of awareness and use of language and words was new to them.

> *I think that maybe necessarily I haven't always thought of that. It's been quite a learning curve. Each word you say is important as well and it can turn it. (PT 3)*

Yes, like making sure you're using certain language and you're not closing down questions and doing things like that. And how you're leading onto the next thing and using the various skills. (PT 9)

It's definitely the language bit of it. You don't realise how loaded your words are sometimes. (PT 16)

4.5.2.8 Category 8: Better together

This category reveals the ways in which participants related to colleagues and practices in the workplace. Working and developing practice alongside colleagues who were also undertaking the training programme was described as very positive, hence the category title 'Better together'. The participants discussed that the they received from colleagues during the training programme was overwhelmingly positive, which reduced anxiety and promoted collaborative learning. PT 16 described working together during the MI training as a team effort, with some participants expressing doubt about the value of training in MI on an individual basis:

The worry soon kind of diminished in the sense of the support that we had within. I think it certainly would be much harder to do it if you're the only one because I do think it's not one of those things you can necessarily do on your own. There is that sort of whole team camaraderie around it as well that makes it much easier. (PT 3)

I think it was good that we were close to each other 'cos it allowed you to collaborate from one day to another what you've learned. (PT 4)

Doing it as a big group together as well was really nice so that so we could feel like it was a team effort and we can talk about it as well between us.

It was quite comfortable, and I think maybe it's more comfortable because we all knew each other. Because were quite a friendly group there was no real kind of oh I'd be too embarrassed to say that in front of everyone. (PT 16)

There was also a sense of peer motivation, with team members keeping each other upbeat, and encouraging each other to participate though ongoing discussion and an awareness of each other's actions.

The team, you know you had people around you who had done it and it became little bit of a jargon. You kind of think, oh she's done some, I better do some as well, so I think that kind of keeps you going. (PT 3)

I think it's better that there are other people doing it, because then you can, you talk about it a bit more, which means you're more likely to use it. (PT 10)

Participants also identified that having colleagues in the same workplace promoted discussion and sharing of practice, both formally as part of supervision sessions, and informally during day to day interaction within the department. Participants found each other a useful resource for discussion, giving ideas, introducing different perspectives and approaches to using MI, and assisting with problem-solving in practice. PT13 described how peer motivation and discussion had reduced over time.

> *There has been a lot of chatter in the department between us of 'I've just done MI on this patient and it worked really well' or, 'this bit worked really well and then this happened', 'well they're back again so I'm going to use MI'. Even when you're talking about patients just as a whole, trying to bounce ideas off of each other, 'well, have you tried MI?', 'Have you done this part of it?' Or 'they're quite resistant to change'.*
>
> *I think definitely if you're doing it as a department you can bounce those ideas off each other, or get ideas or phrases from each other to use and discuss how it has worked. (PT 5)*
>
> *Also the thing about the training which it offered was that social interaction with other physios and bouncing ideas off each other and listening to other people's points of views. That kind of cements different approaches and how people go forward with the training. (PT 12)*
>
> *The other things that have helped me have been having the odd conversation with other colleagues but again this was very much more in the beginning and it's fizzled out a bit more lately. But, sharing your experiences. (PT 13)*

Participants recognised the importance of support from the physiotherapy managers in allowing them to participate, take the time to attend training and supervision sessions. There was a sense that this legitimised the training and made participants feel comfortable and encouraged to participate fully. Managers and supervisors also took a pro-active role in checking participants were completing recordings and participating in the study as appropriate.

> *Support from the senior staff and the manager in the department has got to be there so you feel comfortable with it. (PT 3)*
>
> *I mean we had great support from the manager and then our supervisors. And not only for that but also just saying can we do it can we make sure we've done it. (PT 4)*
>
> *We're very fortunate that it's been supported from higher up we've been allowed that time and you know the money spent on it to have you here and*

to do it. And I do think it is valuable and I do think it is something that will continue to benefit our patients. (PT 5)

Participants described the main change in local working practices during the programme was a move to an online patient record-keeping system. While some participants described this as distracting their focus away from practising MI for two to three weeks as they became accustomed to the new system, other participants described being unaffected by the change.

That definitely had an impact and made us all go with the greatest will in the world, right we've got to get with grips with the computer system before we even start thinking about MI, so MI did go on the back burner and I think that's fair to say for everybody. (PT 5)

Yeah definitely I think we had to give it quite a lot of focus and we needed to give system one quite a lot of focus at the same time. (PT16)

Not for me (the impact), but for other people I think it might have, 'cos some people hated it for a long time. (PT 10)

A local activity identified as having a positive impact on participants was an in-service training talk on chronic pain by a local physiotherapy colleague within the Trust. This appeared to fit in well with the MI training and may have reinforced the participants' LBP beliefs, towards a more biopsychosocial orientation:

I think it reinforced what we'd learnt through the MI I think. Not that it was the same thing at all. But like it kind of you could see, I guess in a way that did help in terms of applying it to physiotherapy because we talked a little bit about sort of pathophysiology of chronic pain so you get that aspect of it but then it's put into the context of everything else that's typically going on with that type of patient. So that's where you could fit in. (PT 7)

I think it tied in quite well with that in terms of beliefs about those patients as well. (PT 9)

In summary, the impact of the workplace on participants in this research was extremely positive and encouraging. The participants described and explained how they benefited from strong peer support, and opportunities for shared practice, within a non-threatening learning environment. This combination of shared experienced reduced anxiety associated with the training, and facilitated the participants' engagement in the learning process and the study. The participants

perceived that learning and practising MI as an individual learner would be much more challenging.

4.5.2.9 Category 9: Keeping on track

The final category is entitled ‘keeping on track’, which includes subcategories relating to the reported challenges which participants needed to overcome when attempting to use MI in practice, as presented in in Table 4.12.

Initially, participants described that they experienced worry, some confusion and stress, when trying out the new MI approach in comparison to their usual physiotherapy practice. Participants described feeling worried that they may leave out important aspects of the assessment such as screening due to the change in structure and flow of the assessment.

> *The worries are always going to be there when you apply something completely new and a completely different approach. All of those kind of things were quite a challenge because we are so used to working within these boxes within that framework which I think is this going to push me, I can't quite see myself doing that with the time. (PT 3)*

> *I think what I was really confused about the start was we have these set of medical questions and screening we have to actually do so I was worried that I would not forget those things but that I you know because of my normal flow of how I do things maybe miss those really important things out. (PT 7)*

> *You’re in that set routine in how you do things so you are concerned that if you do things differently because you're in a back to back clinic that it's going to impact on your assessment time and therefore going to make you delayed and then end up with a stressful day I guess. (PT 7)*

This change in approach also required additional effort and time. Participants did acknowledge that it took additional time to develop any new skill, but time pressure became less of an issue for some participants as the programme progressed:

> *Time I think is an issue as well depending on if your patient is late or let’s say I get someone in and I do start with a method (MI). I’m struggling to kind of reel it in. I’m struggling to kind of move it on to the next part and then you are panicking like I’ve got to get an objective done on this as well so there definitely is a time factor to that as well (PT 9)*

> *I think it is the time pressures again, where you feel that the clock’s ticking, they’re still talking about something like early subjective and getting through the whole kind of 45 minutes you think ‘well I need to get them to go away*

and do something as well' and that I think it is the pressure that we've got. (PT 16)

I think as time has gone on that kind of fades a little bit. I don't think of that as a worry. I don't think the time is so much of an issue. (PT 3)

Participants expressed their interest in MI as an approach and were keen to learn. Participants described an increasing awareness of and interest in the use of psychologically informed approaches within physiotherapy, and an acknowledgement that MI would be relevant to practice.

I've always been interested in psychology and also say that if I didn't do physio I'd do psychology so I still think about you know a different way into something and doing something slightly different as well. (PT 3)

When X emailed the stuff round I had a read of the kind of, I guess the blurb of what it might involve and I thought it's really relevant, there's been a lot of research in the social media recently with regards to physio and therapy and how we can optimise what we do. And there's a lot about CBT and this is a slightly different approach. (PT 5)

Some participants described how the learning experience itself inspired them and there genuine willingness and openness to learning a new approach: a sense of wanting to give MI a try.

When you do a course you're all inspired and you're all kind of geared up. So there's a lot of energy in that just to get started and try it out. (PT 3)

I was very open-minded when I went and started the course because I think you have to be. Someone's trying to show you a different approach to benefit your patients, why not be? I'm very keen to learn at any opportunity. (PT 5)

And I think sometimes I guess I've only been qualified for like 3 years anyway so I'm still open to loads of things anyway and I'll always give things a go. So for me you know it's - if it works then why not do it? (PT 10)

Overall most participants seemed genuinely committed to MI as an approach, and at the time of interviewing some described feeling they were practising MI comfortably and in its intended spirit, even if they felt they were not always adhering to a formal MI approach. Those who seemed to find it easier to work with MI reported that it had become part of their own style and was something they would continue to practice.

I would like to think that it's something I do. I really want to do it. (PT 3)

I think it's in-between something I do and something I'm going to keep on doing. I do use it definitely. I am going to keep on doing it whether it is wholly MI adherent all the time I think is debateable. The spirit is definitely there, whether the structure is always there. But no, I am definitely going to keep on using it you know and aim to use it with everybody. (PT 5)

I really enjoyed it. I felt like I was really in my comfort zone. I didn't feel as if there was anything making me feel uncomfortable. I found it easy to slot my way of thinking into this type of or this method. I really felt as if it was something I could go with and I feel I did embrace it very much at the time. I felt really passionately about it. (PT 13).

Participants described how other aspects of the MI training programme were important drivers to prompt them to stay positive and on board. These included the supervision sessions and support from the researcher which helped to promote learning and heighten awareness, and the commitment they had made to participate in the study and provide audio-recordings at regular intervals. PT 12 identified the importance of having external prompts to 'nudge' practice in such a busy and stressful clinical environment:

I put my hand on my heart here, I think if I hadn't done recordings I would have fallen off the wagon somewhere - not intentionally. (PT5)

So, to get that initial period even though you've got those new skills and things and then to move forward and things and keep practising it's a good driver from that point of view, knowing that someone's coming to see how you're getting on. (PT 9)

I think if we didn't have the coaching then I would've just probably forgotten everything to be honest because it's hard to keep doing it. 'Cos you do it for a week or two and then after a few weeks sometimes you start to forget things. (PT 10)

I think it's the fact that I know that I had time frames to work within. I had to get the recordings done, which isn't a bad thing because every time that I felt like I had to do it I was obviously learning and developing my skills. You coming in and sort of giving us nudges yes, it's an external source of provoking change, but actually that's what has been needed in this stressful clinical environment with lots going on. (PT 12).

The perceived success of using MI in practice acted as positive reinforcement for participants, and was an important factor in building their professional confidence and encouragement to keep practising the approach. This was especially important when there was a positive response from the patient during a session, for example if

they started using more change talk which the participant perceived was due to using MI in practice:

> *I think that's a big thing you know when you see it work once you almost do get that kind of puff in your chest like, okay I can do this, and then you do it again and it's like that kind of almost a staircase of confidence that you travel up and go actually from where I was down here to begin with I'm now right up here confident with using it now. (PT 5)*

> *And I think one thing I've noticed is the more you get the feedback from the patient on the approach, the more willing you are to use it. You know so those last two patients I did I was getting a lot of feedback from them you know and the buzz words and you would like to say in terms of 'you know alright I really do want to change,' 'I know it's down to me now'. That obviously gives you that positive reinforcement to continue to use MI because guess what, it works for you. It's no longer just a theory. It's actually a practical application in terms of your therapy so obviously, you are more inclined to use it and therefore that's going to make you happier to use it. (PT 12)*

> *Having a positive experience with the patient is probably the most powerful thing. It is seeing it work but when I say seeing it work, I think it's very, very early days. (PT 13)*

> *Yeah there's been a lot of things. Even if it's just a particular experience. Even if it's just one part of someone's assessment and you just get them to realise. You can see the realisation sometimes on their face and then you think, well we're on the right track again. (PT 16)*

Conversely participants identified that a negative experience could damage their confidence in the approach, and that was when the encouragement from others became important.

> *Then again if you had those two bad experiences I keep saying it but then if you have a department then it kind of keeps that going through that time. Because someone else is going oh, I just had exactly the same or someone comes up and says it really works, and you think it does you know. (PT 3)*

> *I know my confidence got knocked because I was very green at it all and I think I went a bit gung-ho and this patient did not respond well and I didn't have the tools to deal with that. I think that's put me off perhaps trying this approach with people maybe a bit like him who had a very strict belief system in place. (PT 13)*

The support received by some participants using MI in practice was described as important. There was a realisation that using MI in practice would require a significant change in their own practice. This change was recognised as a

substantial undertaking, and one which would benefit from ongoing support from others beyond the initial training course. The supervision sessions provided reassurance, confirmation and encouragement which was important for keeping the participants and their practice on track.

> *I think that because you're changing your practice. Not a lot but you are really. You're kind of turning things a bit upside down. I certainly am. I can only talk for myself but you certainly are turning it around a bit and I don't think you can do that yourself. (PT 3)*

> *It was really nice to have that kind of confirmation and support from you as well to say you know you're doing a great job or you know what, just change this little bit. And I think it really kept us on track and made sure that when we were doing the MI stuff that we were trying to develop good practice rather than mixing it up with a little bit of this and a little bit of that really. (PT 5)*

> *I think any course that you go on in physio if you don't use it you lose it afterwards and it's been exactly the same with this. So the fact that we have had the opportunity to revisit things and then make it more applicable to what we're doing has made the use of it more relevant I think and easier to carry out. The extra supervision sessions were great to make it more physio specific and back pain specific and then using strategies from that to enable us to try that out with other patients. (PT 7)*

> *I actually think if you just did a weekend course I really don't think it would be sufficient. I don't. I think without that kind of feedback and that motivating from an external source. Because it's a big thing isn't it changing your practice? It's huge. (PT 12)*

4.5.3 Summary

The qualitative data provide important insights into the experiences of participants as they progressed through the MI training programme. The data provide rich descriptions of participants experiences as they challenged and changed their beliefs and practices, and developed new skills. The change in mindset, skills and practice towards a person-centred approach was fundamental to participants' transformation in establishing the new MI practice as a their 'new norm'. Several challenges were overcome by the participants due to their high levels of motivation, their individual and collective efforts, and the external support offered by the researcher.

4.6 Joint display of results from qualitative and quantitative data sets

The results from the four data sets are presented in Table 4.13 as a joint display (Guetterman *et al*, 2015). This draws from examples provided in Guetterman *et al*'s (2015, p. 559) paper which describes 'themes-by-statistics' as a commonly used type of display in which themes generated from qualitative data analysis are presented against quantitative findings within mixed methods studies. The displays are intended to assist the reader in understanding the interface between the quantitative and qualitative data and to facilitate the drawing of inferences from the findings.

In this study the qualitative findings (QUAL) and quantitative findings (QUAN) have been analysed and interpreted. The findings are presented and linked in Table 4.13, facilitating direct side-by-side comparison, and highlighting consistencies/convergence and inconsistencies/divergence between the findings. The qualitative themes and quantitative statistical findings are presented in relation to each other where a relationship exists between the two data sets. Brief descriptions are provided about each theme. Quantitative findings are presented as mean scores with brief comments on statistically significant findings or proficiency levels or conversely, the absence of statistical significance or proficiency where this has more relevance. The final column of the right comments on the presence and nature of consistency/convergence or inconsistency/divergence across the data sets. The qualitative data illuminates the experiences and processes that the physiotherapists were going through, individual and collectively, which may help to explain the quantitative findings. This approach is consistent with the convergent parallel design described in section 3.1.2 and presented in Figure 3.2. Inferences drawn from the findings are discussed in Chapter five.

Table 4.13: Joint display linking qualitative data themes with quantitative findings

Study objective three	**Study objective 1**	**Study objective 2**		**Consistency/ convergence AND inconsistency / divergence between data sets**
QUAL	**QUAN**	**QUAN**	**QUAN**	
Semi-structured interviews	**Beliefs and attitudes questionnaires (PABS-PT, HC-PAIRS)**	**Self-reported proficiency, confidence and intention to use MI (VAS)**	**Motivational interviewing coding outcomes (MITI)**	
Theme 1: Transformative Learning Journey Changed knowledge, skills and practice which were fundamentally ingrained to a 'new norm' as a result of MI training MI was incorporated to complement own style to become more natural and comfortable Participants able to do things differently in their practice		**VAS** **Group A** 0 to 6 months ↑ Proficiency 3.1 to 66.9 ↑ Confidence 4.0 to 70.6 ↑ Intent 61.2 to 85.7 **Group B** 0 to 6 moths Proficiency 21.3 to 22.1 Confidence 19.4 to 18.6 ↓ Intent 76.5 to 22.2	**MITI Global ratings Group A 0 to 6 months** ↑ Global Spirit 2.8 to 3.5 ↑ Evoc 2.3 to 3.1 ↑ Collab 2.9 to 3.7 ↑ A/supp 3.2 to 3.7 **Group B** Changes not statistically significant **Exceeded baseline proficiency Global Spirit:** **Gp A** – 1 at baseline, 6 at 3 months, 6 at 6 months **Gp B** – 0 at baseline, 1 at 3 months, 1 at 6 months **Behav Count Scores 0 to 6 months** **Gp A:** %CR 2.0 to 5.1, ↑%OQ 14.8 to 25.3, R:Q 0.2 to 0.3 %MIA 74.6 to 88.9 **Gp B:** %CR 1.00 to 0.0, %OQ 17.9 to 19.7, R:Q 0.2 to 0.2, %MIA 84.7 to 100.0	**<u>Consistent/ convergent:</u>** **With transformative changes in MI practice** **Gp A** ↑ in MITI global ratings n=6 reaching proficiency ↑ VAS **With expected changes:** **Gp B** not achieving significant differences in scores **<u>Inconsistent / divergent:</u>** **With changes expected:** **Gp A** Not reaching proficiency levels in behaviour counts **With baseline expectations:** **Group B** Higher baseline VAS in Group B Higher %MIA in Group B – reached competency at 6 months

Study objective three	**Study objective 1**	**Study objective 2**		**Consistency/ convergence AND inconsistency / divergence between data sets**
QUAL	**QUAN**	**QUAN**	**QUAN**	
Semi-structured interviews	**Beliefs and attitudes questionnaires (PABS-PT, HC-PAIRS)**	**Self-reported proficiency, confidence and intention to use MI (VAS)**	**Motivational interviewing coding outcomes (MITI)**	
Theme 2: Changing beliefs, roles and expectations Change in beliefs and attitudes to persistent LBP Practice more person-centred. Engaging with patients, listen more. Less directive and more collaborative Empower patients to make choices about their own care Recognise patient readiness and work more effectively with patients perceived to be challenging	**PABS-PT 0 to 6 months** **Group A** ↓ Biomedical 25.2 to 18.3 ↑ Behavioural 29.2 to 32.6 **HC-PAIRS 0 to 6 months** ↓ Total HCP 39.2 to 32.1 ↓ Dimension 1 26.2 to 20.4 **Group B** Changes not statistically significant		**MITI Global ratings Group A 0.to 6 months** ↑ Global Spirit 2.8 to 3.5 ↑ Evoc 2.3 to 3.1 ↑ Collab 2.9 to 3.7 ↑ A/supp 3.2 to 3.7 **Group B** Changes not statistically significant	**<u>Consistent / convergent:</u>** **With changes described Gp A** With changes described: PABS-PT changes HC-PAIRS changes ↑ in MITI global ratings **Gp B** **With expectations for Gp B** not achieving significant changes in PABS-PT, HC-PAIRS and MITI global ratings **<u>Inconsistent / divergent:</u>** None

Study objective three	**Study objective 1**	**Study objective 2**		**Consistency/ convergence AND inconsistency / divergence between data sets**
QUAL	**QUAN**	**QUAN**	**QUAN**	
Semi-structured interviews	**Beliefs and attitudes questionnaires (PABS-PT, HC-PAIRS)**	**Self-reported proficiency, confidence and intention to use MI (VAS)**	**Motivational interviewing coding outcomes (MITI)**	
Theme 3: Overcoming challenges Several challenges noted Overcome by own motivation and support of others internal and external to the workplace Audio-recordings acted as prompts		**VAS** **Group A** 0 to 6 months ↑ Intent 61.2 to 85.7 **Group B** 0 to 6 moths ↓ Intent 76.5 to 22.2	**Exceeded baseline proficiency** **Global Spirit:** **Gp A** – 1 at baseline, 6 at 3 months, 6 at 6 months **Gp B** – 0 at baseline, 1 at 3 months, 1 at 6 months	**<u>Consistent/ convergent:</u>** **With high levels of motivation** Group A Intent high and increasing over 6 months Group B Intent ↓ **<u>Inconsistent / divergent:</u>** Group B intent higher than group A at baseline

Key: *QUAL, qualitative data* *QUAN, quantitative data* *PABS-PT, Pain attitudes and beliefs scale for physiotherapists*
↑ statistically significant increase *↓ statistically significant decrease* *HC-PAIRS, Health care providers' pain and relationship scale*

MITI, Motivational interviewing treatment integrity scale, Evoc, evocation, Collab, collaboration, A/supp – autonomy/support

Chapter 5 Discussion

5.1 Introduction

The main aim of this study was to investigate the impact of a motivational interviewing training programme on the beliefs, attitudes and practice of musculoskeletal physiotherapists managing patients with persistent LBP patients.

This mixed methods study had three objectives, to: investigate the impact of an MI training programme on physiotherapists' attitudes and beliefs regarding LBP; investigate the impact of an MI training programme on physiotherapists' MI behaviour in the clinical setting with persistent LBP patients, and; explore physiotherapists' experiences of transferring MI skills from training into practice. The main findings of the study have been presented in chapter four, set out against the research objectives as a 'themes-by-statistics' joint display in Table 4.13.

As part of the convergent parallel mixed methods design of this study (section 3.1.2, Figure 3.1), this chapter draws inferences within and across both qualitative and quantitative findings, and in relation to relevant previous research literature. Study limitations are also discussed.

5.2 Physiotherapy participants and practice context

Overall 15 out of 16 participants completed the study over a six-month period, demonstrating a high level of motivation to learn MI as an approach and commitment to participate in the research. Practitioner readiness is seen to be an important component of behaviour change and implementing MI in practice (Barwick *et al*, 2012; Michie *et al*, 2005). VAS mean intention to practice MI for Group A was 61.2 at baseline, increasing to 86.3 post training. This reduced at three months to 69.1 and was back up at six months to 85.7.

Although results should be interpreted with caution due to the small sample size, it is notable that Group A VAS intention to practice scores were maintained throughout the study. Interestingly VAS mean intention to practice was higher at baseline in Group B (76.5), primarily due to two participants in this group who provided higher scores than would have been expected (Table 4.6; Appendix 26). The Group B mean score dropped to 30.5 at three months and 22.2 at six months. Although

Group B participants did not participate in the full MI training programme, the offer of an MI training course as CPD after the study period was known to participants and may have prompted these individuals to report this level of intent to practice MI at baseline.

The high levels of commitment and motivation described by Group A physiotherapists as present from the start, were important in keeping them on track during the study, as well as other motivating factors such as the supervision, external support (outlined in section 4.5.3.3), and the support provided through being part of a positive work group (section 4.5.3.2).

The physiotherapists in the study had varying levels of experience (Appendix 26), but Group B physiotherapists were more experienced in terms of length of time qualified and experience of musculoskeletal physiotherapy than those in Group A. The higher levels of experience may have resulted in the higher self-reporting of baseline VAS measures of proficiency and confidence at baseline than would have be expected in Group B compared with Group A (Table 4.1 and Appendix 26). It is also noted however that self-reporting of MI proficiency may not be a reliable predictor of proficiency as observed in practice (Wain *et al*, 2015; Miller *et al*, 2004; Miller and Mount, 2001).

Most participants were known to each other, which may have facilitated the ease with which Group A was able to perform role play and engage in the training. The importance of the supportive infrastructure has been observed by other researchers in translating MI into practice (Östlund *et al*; 2015; Söderlund *et al*, 2008) in nurses, and in relation to the implementation of self-determination theory based practitioner behaviour change in physiotherapists (Matthews *et al*, 2015).

The workplace did also provide some challenges, for example, the introduction of a new online record-keeping system during the period of MI training, which provided an additional obstacle for some participants, as described in section 4.5.3.2.

5.3 Changing beliefs and attitudes

The findings of this study suggest that participation in an MI training programme can change the beliefs and attitudes of musculoskeletal physiotherapists in relation to

persistent LBP. The reported inadequacy of psychological education in pre-qualifying physiotherapy programmes is said to be responsible for the predominance of biomedically orientated attitudes and beliefs of physiotherapists (Heaney *et al*, 2012). This need for post-qualifying education interventions which promote a more behavioural orientation has also been recognised by other researchers (Synnott *et al*, 2015), and by participating physiotherapists in this study (section 5.3.2).

The significant changes observed in PABS-PT and HC-PAIRS scores for Group A participants in this study compare favourably with other studies investigating the impact of an educational intervention on the beliefs and attitudes of physiotherapists (Jacobs *et al*, 2016; Evans *et al*, 2010; Overmeer *et al* (2009) and physiotherapy students (Domenech *et al*, 2011). This study has the advantage of demonstrating medium term outcomes over six months rather than just immediate post-intervention effects.

The length and delivery patterns of the physiotherapist education in studies varied between an eight-week (64 teaching hour) course (Overmeer *et al*, 2009) to 7 hours (Jacobs *et al*, 2016). The face-to-face MI training programme of this study was 21 hours which, although lower than Overmeer *et al* (2009), still required substantial time investment from participants and workplace support. Evans *et al* (2010) delivered their intervention successfully as an information package by post. A distance learning approach would be economically desirable; however, this approach has not been effective with MI training delivery to date (Shafer *et al*, 2004).

The findings that the orientation of Group A physiotherapists was less biomedically focused and more behaviourally focused post-intervention are consistent with the qualitative findings in category four (section 4.5.2.1). Group A physiotherapists described a change in mindset and beliefs, and an increasing consideration of the patients' perspective as a result of the MI training programme. The change in mindset led to altered perceptions about their role with patients with some physiotherapists describing a shift to a more holistic and person-centred perspective. This is exemplified by PT 5 as follows:

> *I think I'm a lot more understanding of peoples' situations and understanding of where they are in their head with regards to what's happening to them. So, my beliefs about people with chronic pain or back pain have definitely changed.(PT5)*

Unlike other educational interventions which have provided information on clinical recommendations (Evan *et al*, 2010) or on explicitly identifying and managing psychosocial issues (Jacobs *et al*, 2016; Overmeer *et al*, 2009), the training provided in this study focused specifically on developing knowledge and skills in MI as a psychologically informed approach (Appendix 7). It could be suggested that the nature of the content and delivery of the MI training programme was able to influence the beliefs and attitudes of the participants, potentially through the focus on the person-centredness of MI spirit and MI principles, and their application in practice.

5.4 Challenging and changing the role and scope of practice

Given the findings of previous research where consideration of psychosocial factors in addition to biomedical factors was reported as outside of physiotherapists' scope of practice (Synnott *et al,* 2015), the reporting of practice behaviour change in the participants of this study to a more integrated approach is positive. PT 7 described a change in practice to one in which she was practising using a more holistic approach (section 4.5.2.1):

> *..you're aware that it's not just the physical symptoms that you're sort of dealing with. It is a package of care, a holistic approach. It's about looking at every aspect of their life and how they can change those things to make it better. (PT7)*

As part of a learning journey (category 2, section 4.5.1.2), the development of professional confidence was important for some physiotherapists to be able to move away from practitioner-centred practice:

> *I think it goes back to appreciating that you don't have to tick all these boxes in terms of treatment to be successful. Because you can actually get to a good place by just exploring things a bit more and that person could feel better by that whereas you haven't maybe done your sort of standard physiotherapy stuff when it comes to back pain. I think you get worried that if you don't include all of that, that you've not really done your job. (PT7)*

Patient expectation also plays a part in shaping the physiotherapists' role and their perceptions of it. From a patient perspective, clinician expertise and treatment credibility are important and can influence treatment outcomes (Peersman *et al*, 2013; Smeets *et al*, 2008; Licciardone and Russo, 2006). The physiotherapist's role

as an expert who has traditionally directed care and 'fixed' the patient is challenged by the application of a more person-centred approach. Not all patients are accepting of this approach or ready to engage with it (category 6; section 4.5.2.3).

Previous research has identified attributes physiotherapists associated with 'difficult' patients (Potter *et al*, 2003b). Working with patients perceived to be difficult is considered outside of the scope of practice for some physiotherapists (Sanders *et al*, 2013). In contrast, the Group A participants in this study recognised challenging patients as not only part of their role, but recognised the need to hone their MI skills to 'dance' with the patient in an attempt to manage them more effectively (section 4.5.2.3, PT 7). One new insight added by this study was the positive impact on the well-being of participants when using their newly-acquired MI skills to work with 'difficult' patients. This is an important finding in a service (NHS) where staff are under considerable pressure from increasing service demands and complexity of patient needs:

> *It doesn't feel as hard to battle against people. It was kind of uplifting at the end rather than sometimes your chronic patients you're like 'right that was tiring'. That's why we came into the job, I want to help people, and if that's what you end up doing you feel better at the end of the day. (PT16)*

Despite the development of a more behavioural orientation in Group A participants, the important responsibility of physiotherapists needing to recognise symptoms which may be indicative of serious spinal pathology was emphasised by one of the participants (section 5.3.2, PT4). This highlights the complex nature of persistent LBP, and the need for physiotherapists to be able to identify and manage both biomedical and psychosocial / behavioural aspects of a patient's care in an integrated way. The importance of diagnostic triage, including an appropriate use of red flag questions as part of an initial assessment is well-established (Ferguson *et al*, 2015; Greenhalgh and Selfe, 2009). It is the normalising into standard care of the identification, recognition and management of psychosocial factors as part of an integrated psychologically informed approach which has remained elusive (Gray and Howe, 2013; Main and George, 2011). The changes described by the physiotherapists in this study suggest that it may be possible for physiotherapists to change to a more behaviourally orientated and integrated approach to practice through participation in training focused on enhancing knowledge and skills in MI, a person-centred approach.

Although no causal association has been investigated between the small quantitative data sets within this study, the consistency and convergence of findings across quantitative and quantitative data sets supports the findings of others that the beliefs and attitudes of physiotherapists may influence their clinical practice (Darlow *et al*, 2012; Bishop *et al*, 2008). Specific to this study is the finding that participation in MI training promotes a shift in thinking in musculoskeletal physiotherapists which can result in a change in their perceptions about their professional role.

5.5 Developing MI practice

The two-day training course generated post-course increases in self-reported proficiency and confidence in MI in Group A participants, demonstrating an immediate effect of the initial training on their perceptions. These immediate effects are likely to be due to the increase in knowledge of MI and an awareness of MI spirit as observed by other researchers since post-training practitioner proficiency in MI is reported to take longer to achieve (Walters *et al,* 2005). It is also acknowledged that self-reported proficiency is not always predictive of MI proficiency in practice (Wain *et al*, 2015).

As presented in section 4.4.2, quantitative analysis of the Group A MITI scores identified mean increases in the global ratings of evocation, collaboration and autonomy/support, and global spirit at three months, which were maintained at six months. These findings are in agreement with other researchers who identified significant but variable practitioner changes after undertaking MI training (Barwick *et al*, 2012; Söderlund *et al*, 2011; Madson *et al*, 2009), although none of these studies include research on the impact of MI training on physiotherapy practice.

Although samples sizes are small, these increases do represent a positive trend in physiotherapists' abilities to develop and maintain MI-consistent behaviour during participation in a MI training programme. More than half of the physiotherapists in Group A achieved beginning proficiency and competency according to Moyers et *al*'s (2010) MITI 3.1.1 competency thresholds for global spirit (Table 4.10). In addition, two group B physiotherapists also demonstrated beginning proficiency. This may be due to the high levels of experience of the physiotherapists in Group B, even though none had undertaken formal training in MI or other psychologically

informed approaches.

Part of the MITI evaluation also included the analysis of behaviour count summary scores (section 4.4.2; Table 4.11). Although a trend of increasing scores was observed for Group A in % open questions, the scores were variable and did not approach beginning levels of proficiency (Moyers *et al*, 2010). The scores gained in this study are lower than scores achieved by medical students after eight hours of training (Daeppen *et al*, 2012) and are divergent with participant descriptions of how the new MI skills and language used in their practice had become their new norm (section 4.5.3.1):

> *But I think it is getting there. It's changing and that's the new spiel now. (PT 16)*

The reasons for the low scores may be due to the high number of questions asked by physiotherapists during an initial patient assessment, which is often based on a proforma emphasising didactic questions, including red flag questions. It may therefore be technically possible for physiotherapists to demonstrate good consistency with global rating dimensions while their verbal behaviours are less consistent.

The MI supervision sessions were well received by participants, who felt they were a necessary extension of learning from the two-day course. Both individual and group sessions were considered to be useful (section 4.5.1.1). The supervision sessions, researcher visits and the provision of audio-recordings at regular intervals were all reported to be key practice drivers and prompts to stay on track (section 4.5.3.3).

Within this mixed methods approach, the positive quantitative findings are convergent with and illuminated by the meanings gained from analysis of the qualitative experiences. For example, the increases in MI global ratings scores (MITI) are enhanced by descriptions of participant experiences of putting MI into practice presented in section 4.5.1.3. Early practice involved actively selecting patients based on identifying patient readiness. This is line with the close association noted between MI and TTM (Miller and Rollnick, 2009; Prochaska and DiClemente, 1982).

> *It's reading the patient in front of you, kind of getting the vibe from them if they're ready to make that change or not. And then obviously using your MI to support that. I think it goes a bit hand in hand, rather than two separate entities. (PT 5)*

The maintenance of MI global ratings scores for the duration of the study is convergent with participant descriptions of adapting MI and using aspects of MI more flexibly across their patient caseload. This finding is in agreement with Schwalbe *et al*'s (2014) meta-analysis of training studies which identified that three to four supervision sessions were required to maintain MI skills over a six-month period. However, this is the first time this pattern of MI skills development and pattern of learning support has been identified specifically with a physiotherapy cohort.

At the end of six months, several physiotherapists described how they had managed to embed their use of MI to complement their own style of interaction with patients (section 4.5.3.1).

> *I think it is becoming a bit more of a natural process or natural communication style rather than a thought, a conscious effort. I think that bit, you know I think three quarters of the MI approach is completely natural to me now. (PT 12)*

Based on the limited numbers included in this study, it is suggested that an MI training programme delivered over six months can develop and sustain MI-consistent behaviour in musculoskeletal physiotherapists in terms of MI spirit, and across a number of global domains consistent with person-centred practice. This finding is novel within physiotherapy practice.

5.6 Developing person-centred practice

Earlier in the thesis, it was hypothesised that training physiotherapists in a person-centred approach such as MI may promote a more biopsychosocial orientation in participants' beliefs and attitudes (section 2.6). As outlined in sections 5.3 and 5.4, the participants in this study described developing more behaviourally focused beliefs and attitudes towards LBP patients, and have also demonstrated MI-consistent behaviours, including those relating to person-centred dimensions such as evocation, collaboration, autonomy/support and global spirit (section 5.5).

As well as demonstrating MI-consistent practice, MI global ratings in dimensions of evocation (the participants' demonstration of an understanding that the motivation and ability to sit with the patient), autonomy/support (supportive of the patient's perception of choice) and collaboration (promotion of patient contribution and power sharing) are key attributes also associated with a person-centred approach in physiotherapists (Josephson *et al*, 2013; Potter *et al*, 2003a).

Participants reflected that they may have practice knowledge and skills gaps in eliciting and recognising unhelpful patient beliefs which may be affecting patients' recovery and in working effectively with patients who hold such beliefs (section 4.5.3.1). These gaps have also been highlighted by other authors (Sanders *et al*, 2013; Foster and Delitto, 2011).

Participants described a realisation of what it means to work in a person-centred way and provide a more holistic package of care (section 4.5.2.1) PT 10 reported:

> *I think I always tried to be patient-centred, but actually implementing that is a different thing isn't it? Actually asking them what do you think is the problem, and why are you here? And how do you think you're going to make it better? It's different to just thinking I think this is the problem and I think this is how it's going to get better. (PT 10)*

The qualitative data reported in section 4.5.2.2 provides an account of participants' behaviour becoming less directive, moving away from employing a righting reflex and to a guiding style of approach more consistent with MI (Miller and Rollnick, 2013). Participants described greater shared decision-making during the therapeutic interaction and in the planning of the treatment, at the end of which patients 'walked out with their choices' (PT 3), rather than those directed by the participants. The shared experiences described by the participants reflect those reported by other researchers as important to patient-centred care from the perspective of the patient (Kidd *et al*, 2011; Cooper *et al*, 2008). This is also convergent with increased collaboration scores demonstrated in the MITI global ratings for Group A participants (Table 4.8). The new insight gained in this study is the capacity of physiotherapists, given the right conditions and context, to recognise and realise that their practice may not be as person-centred as they thought and that they are able to change practice behaviour as a result.

Improved outcomes are likely when person-centredness involves activating patients into taking action rather than simply taking their perspective (Michie *et al*, 2003). Participants gave several accounts of where their behaviour had an impact on their patients, which included instances of patients opening up more, and taking control of their care (section 4.5.2.2.):

> *I probably really now ask the patient what do you want. So before jumping on the bandwagon right let's do this this and this, just say what do you actually want from that. I have had a couple of times people say I know my pain may not change but I want to be able to do that. (PT 9)*

Although a small number of physiotherapists were involved in this research, the accounts given by them changing practice behaviour to a more person-centred approach with patients are compelling. One of the most important areas is a realisation that their practice was not as person-centred as they thought, and that it was possible to change their practice to more person-centred approach as a result of participating in the MI training programme.

5.7 Developing language and communication

Communication is an important area of clinical practice which has been shown to affect patient behaviour (Darlow et al, 2013; Barker et al, 2009), and have a direct and indirect impact on health outcomes (Street et al, 2009). Additional training in communication skills for physiotherapists has been recommended by several authors to overcome the challenges faced by them in working with persistent LBP patients (Josephson *et al*, 2013; Cooper *et al*, 2008). This study is the first to have focused on the experiences of physiotherapists in learning and developing skills in MI in, a communication based approach which has a strong focus on language.

Although it is positive that MITI global ratings of evocation increased in Group A participants over time in this study, the MITI behaviour counts summary scores demonstrate that it was challenging for participants to change the structure and pattern of their language in relation to MI microskills. This data is convergent with participant descriptions that changing their language was one of the most difficult tasks they faced during MI training. In section 4.5.3.1 participants likened the use of new approaches to language with changing a familiar script or breaking a habit.

We have to really think about what we're saying. Because you're having to over think everything so it's quite tiring as well. You're trying to reword everything completely differently. (PT 10)

Patient change talk is seen as an important mediator in promoting positive health outcomes (Copeland *et al*, 2015; Martin *et al*, 2011). Therefore, the development of evocative language as an MI skill to elicit and reinforce change talk is essential. The evaluation of behaviour focused specifically on cultivating change talk is not well developed in the MITI 3.1.1 (Jelsma *et al*, 2015) and as a result specific verbal behaviour of reinforcing change talk was not evaluated. Given its importance in promoting positive patient outcomes it would be useful to measure this behaviour in future studies, perhaps using the newer version of MITI (4.2.1; Moyers *et al*, 2015) which includes change talk measures.

Participants described their assumptions that they were allowing patients to talk, but had become increasingly aware that they may not be actively listening to their patients (section 4.5.2.2). This finding is supported by other research investigating physiotherapists' communication in practice, in which physiotherapists have dominated the conversation and frequently interrupted patients during an encounter, and demonstrated poor listening skills (Chester *et al*, 2014; Roberts *et al*, 2013).

I think I listen an awful lot more rather than going 'this is what I know'. If you looked at does the patient feel that they have been listened to and their concerns taken on board? I think massively improved……I think I was quite 'nope we're doing it this way' before, now I'm very much more inclined to 'well, how do you want to change this? What would you like to do to make this better? Have you got any ideas'? (PT 5)

Given the reported use of communication prompt sheets by participants, one of the key considerations in training physiotherapists in MI is whether to provide a guide or a 'script' for use in practice to supplement their training. This guide could combine the standard physiotherapist SOAP format with MI processes, principles and to guide the interaction and communication prompts to facilitate language development. Although this seems a logical step, the risk is that strengthening the structured approach to the therapeutic encounter may result in a more practitioner-centred approach, which is less aligned with the MI spirit (Hiller *et al*, 2015; Josephson *et al*, 2013; Amrhein *et al*, 2003). It would be important to ensure that the

physiotherapists began using this only after they had participated in some initial training in MI to develop knowledge and awareness of MI spirit.

5.8 Overcoming barriers to translating MI training into practice

This study identified several challenges in translating MI into health care practice. Although the barriers and enablers have been investigated by other health care researchers (Östlund *et al*, 2015b; Brobeck *et al*, 2011; Söderlund *et al*, 2008), none of these studies involved a directly comparable group of physiotherapists (nurses). Some of the barriers identified in these studies are similar to those experienced by physiotherapists in this study however these are all descriptive qualitative studies, rather than mixed methods studies in which qualitative findings can be used to illuminate quantitative data. The main barriers identified in these studies include: the challenge of learning something new; reprogramming thinking and perceptions of professional role; communication challenges such as active listening and communicating with patients perceived as difficult; and a supportive work infrastructure and peer support. Matthews et *al* (2015) also identified a range of potential barriers when developing a TDF with physiotherapists prior to training in a SDT-based communication approach, although these were based on supposition rather than experience gained during the training.

As has been outlined in section 5.7 (and section 4.5.1.2), changing and incorporating new language into an ingrained approach was highly challenging, at least in the initial weeks. In agreement with Östlund *et al* (2015b) and Brobeck *et al* (2011), participants in this study also found that they needed time to try MI out so they could reflect and learn from their mistakes and develop their practice. The participants in this study were able to overcome these challenges so that the new MI approach became their new spiel, although the behaviour count scores remained low (except %MIA).

Worries about time caused concern initially due to the additional time needed to fit in what participants saw as additional content and new ways of working into their existing assessment format (section 4.5.3.3). This led to concerns that they may miss out something important (such as red flag indicators), or that they may run late and the resultant delay would make their day more stressful.

Given the level of concern felt by participants in this research, the time allowed for assessment is an important factor to consider during the planning of an MI training programme. The standard initial assessment time allowance in the department was 45 minutes. When participants felt they needed more time, they lengthened the sessions, often using up time normally taken for administration. Strategies for incorporating the MI skills into the practice setting were covered as part of supervision sessions, and it may be that these sessions, along with ongoing practice, promoted greater fluency and efficiency in the assessments. Time appeared to be less of an issue as the programme progressed and participants became more proficient in MI and fluent in incorporating MI into their own style (section 4.5.3.1). Despite concerns about time-keeping, the participant who ran a neuromusculoskeletal triage clinic with 20-minute assessments also described being able to incorporate MI into practice successfully.

Although participants were concerned initially by the proposed changes to their practice and were aware of the challenges of learning something new, overall their desire to learn and to try something seemed to overcome this concern (section 4.5.2.2). Östlund *et al* (2015b) reported the importance of practising MI in order to build confidence and overcome insecurities in delivering MI in practice. However, in this study participants also described the perceived importance of professional confidence in putting new skills into practice.

Previous studies (Östlund *et al*, 2015b; Söderlund *et al*, 2008) identified the most important aspects which enabled participants to keep on track were the support gained from peers and the positive workplace environment (section 4.5.3.2). In addition to these aspects, the role of external support provided by the researcher and the supervision sessions were also highly valued in this study (section 4.5.3.3). Prompts generated by participation in a research study such as the need to provide audio-recordings:

> *I put my hand on my heart here, I think if I hadn't done recordings I would have fallen off the wagon somewhere - not intentionally. (PT5)*

One area of practice development which was challenging but which participants appeared to gain the most benefit from was their increased confidence and reported ability to work effectively with difficult patients (section 4.5.2.3). Söderlund *et al*

(2008) also identified this as a challenge, and their participants described ongoing feelings of frustration when patients were unwilling to change behaviour. In this study, participants seemed to have come to terms with the reality that patients were not always ready or willing to change. They described a need to explore, recognise and manage patients' expectations. Participants were able to identify and work more effectively with patients who were not ready for change, and to be more open with patients in discussion about this. This approach acknowledged the patients' role in managing their own health, and taking responsibility for it, (section 4.5.2.3):

> *I feel comfortable to ease off and then maybe try to wait when they're ready. So the dialogue before would be cut short to make sure that that's achieved. Now I just feel I can go even a whole session engaging with them until they feel they are ready and either they are or they're not, so I don't feel frightened of that longer journey. (PT 4)*

Several barriers and enablers have been identified in this study which are novel to physiotherapy and to other work in this field, including strategies for prompting practice to keep participants on track. Although the study was delivered in a specific practice context and within a supportive workplace environment, the diverse factors identified could contribute to the future planning of research into MI with physiotherapists and other health care practitioners.

5.9 Limitations of the Study

The sample size in this study was small, with sixteen participants overall, and fifteen completing the six-month study. This small and inadequately powered sample size size means that quantitative results should be interpreted with caution. It is the case that the quantitative data trends suggest that participation in a MI training programme may result in positive outcomes on physiotherapists' beliefs, attitudes and behaviours. The limitation of the small sample size for the quantitative results is mitigated to some extent by the inclusion of qualitative data which enhances and strengthens the overall findings through the linking of data and discussion of the inferences generated through this process.

The participants in this study were self-selected volunteers based in a greater London primary care setting, which reduces the generalisability of the findings (Polit and Beck, 2010). The volunteer participants may have been more motivated to

participate and practice MI during the study. Participants were allocated to groups on a first-come, first included basis. The allocation was not through randomisation, but was based solely on the availability of the participants to attend the initial two training days, and did not differentiate based on any other variable. Baseline comparisons across the two study groups were not significantly different apart from VAS baseline scores in proficiency and confidence in practising MI. In such a small study randomisation would not necessarily have ensured similarity of the study groups and pragmatically would have made scheduling of additional initial training courses difficult to manage for a sole researcher.

The focus of the research questions and outcome measures in this study was on the physiotherapist participants. The research involved patients within the audio-recordings: it did not measure patient outcomes in relation to persistent LBP as a result of using MI. Although the absence of patient data may be considered a limitation of the study, it is important firstly to be able to demonstrate treatment fidelity in physiotherapists, since this is a key quality recommendation when conducting studies investigating MI (Miller and Rollnick, 2014). The nature and effectiveness of MI training on physiotherapists' practice, and the mechanism of translation of MI skills is largely unknown for physiotherapists, although it has been studied in other professional groups (Copeland *et al*, 2015; Martin *et al*, 2011). The impact of MI training on physiotherapists was therefore the focus of this study.

Although the MITI 3.1.1. appeared to be sensitive to changes in the global ratings of physiotherapists, the coding tool was designed for use with counselling therapists (Moyers *et al*, 2010). The role of the MITI 3.1.1 and newer MITI 4.1.2 with physiotherapists requires further exploration to determine the appropriateness of this measure with this practitioner group (Moyers *et al*, 2015). The BECCI may be a useful prompting and feedback tool, but both the MITI and BECCI may lack the capacity to identify the active ingredients of the MI process (Dobber *et al*, 2015; Lane *et al*, 2005).

On reflection, and in light of participant feedback on the wider use of MI across several patient groups, the patient selection criteria may have limited the scope of practice of the participants in the study unnecessarily. The focus of this study was on the development of the skills of the physiotherapist, rather than any outcomes associated with the patient group. The patient group had been selected on the basis of recommendations proposing the use of MI for persistent LBP, especially during

consultations perceived as challenging (Foster and Delitto, 2011). However, Group A participants in this study found that MI had greater utility across a wide range of patients and conditions (section 4.5.1.3). If the criteria had been more wide-ranging, the number of eligible patients would have increased and made patient selection easier as a result. This may also have provided an opportunity for participants to provide a larger number of audio-recordings which may have been more representative of their practice during the training period.

5.10 Researcher positioning and influence

The researcher was involved at all stages of delivery and analysis of this study, and it is appropriate therefore to acknowledge and explore the role and potential influence the researcher may have exerted on this research. As a musculoskeletal physiotherapist researching the impact of a training programme on other musculoskeletal physiotherapists, the researcher can be considered an 'insider', working with the physiotherapist community of which she is a member (Morse, 2010). In contrast, the researcher can be considered an 'outsider' in relation to the health care organisation in which she carried out the research (Brannick and Coghlan, 2007).

In the context of this research, the researcher was therefore operating both as an insider and outsider. Other researchers have argued that the insider/outsider dichotomy is false and too simplistic, and that it is possible to operate in both roles to varying degrees, maximising the advantages of both positions, and at the same time taking steps to minimise the impact of any disadvantages (Greene, 2014; Dwyer and Buckle, 2009; Breen, 2007). The researcher in this study considered the insider role to be the dominating position given the focus on physiotherapy practice in the research.

Several researchers have described a number of advantages and disadvantages to being in insider and outsider roles in relation to the research process (Greene, 2014; Morse, 2010; Chavez, 2008; Brannick and Coghlan, 2007). The insider role as physiotherapist provided several advantages to the researcher, including expediency of access to the study site and participants during the planning phase of the research. The professional knowledge of the researcher meant that she was aware of cultural and practice norms, including the codes of conduct and workplace

hierarchies which made it easier to navigate the environment and systems during the study. It also provided knowledge and insight required to conduct the research, and collect and interpret the data, with an awareness of the nuances of physiotherapy culture and practice (Chavez, 2008).

The position of the researcher as an experienced physiotherapist and academic provided immediate legitimacy in the field and expedited rapport building. This facilitated the development of a positive professional relationship between the researcher and the participants during the study. This was especially the case with Group A participants who attended for monthly supervision sessions as part of the training programme. The participants experienced a strong sense of support from the researcher, whom they trusted would provide them with advice and guidance when needed. This positive relationship could also have been a potential source of social desirability bias in participants during semi-structured interviews and in responses to quantitative questionnaires, defined as 'the tendency of research subjects to give socially desirable responses instead of choosing responses that are reflective of their true feelings' (Grimm, 2010, p. 2). Participants were reassured during quantitative data collection and semi-structured interview that their contributions would be anonymised and they were encouraged to be honest and open in their responses. In addition, her role as an outsider allowed the researcher to distance herself from the social roles and hierarchies within the workgroup and organisation, reinforcing her role as a third party who had no local jurisdiction.

A possible disadvantage to the insider position is that in 'knowing the setting' the researcher may have found it more difficult to see 'what was going on' (Morse, 2010, p. 1461). Familiarity with physiotherapy practice could have led to the researcher failing to see assumptions that were being made during data interpretation and may have led to researcher bias. The risk of bias was minimised through steps taken to achieve trustworthiness of the data, such as an independent review of data by other researchers and use of a reflexive log, which was kept by the researcher to promote 'thoughtful, conscious self-awareness' during the study (Finlay, 2002, p. 532; section 3.8).

The researcher was aware of her potential influence on participants and sought to minimise the effects of this on the research, especially the researcher's own assumptions about MI and its application. The overall influence of the researcher appears to have been a positive, mainly acting as a source of support and guidance

for the participants. The ‘need for an inspiring support’ has been identified as important to nursing participants in putting MI into practice (Östlund *et al*, 2015b).

5.11 Summary

This chapter has drawn inferences from qualitative and quantitative findings in this mixed methods study. The use of mixed methods in this study has allowed processes to be revealed within physiotherapists’ experiences which may help to explain the quantitative findings and to understand how this group of physiotherapists were able to learn a new approach and change their practice. This has enhanced the results and provided greater levels of discovery than would have been possible in a mono-method study, especially one with a small sample size.

New knowledge has been discovered about the impact of an extended MI training programme on musculoskeletal physiotherapists. Despite the traditional biomedical dominance within physiotherapy practice (Bishop and Foster, 2005; Ostelo *et al,* 2003) the study suggests that physiotherapists can change their beliefs and attitudes in relation to LBP through participation in MI training. MI training can also impact physiotherapists perceptions about their role with patients, challenging their current practice and approach to patient care.

The study has also suggested that learning a person-centred approach such as MI can heighten physiotherapists’ awareness of the concept of person-centredness, and provide them with the knowledge and skills to change their practice to a more person-centred and less directive approach, enhancing shared decision-making, patient empowerment and active listening.

Descriptions of practice changes are consistent with changes in quantitative data scores, albeit these must be interpreted with caution due to the small sample size. The MITI global ratings scores suggest that it is possible to train physiotherapists in MI, and for this practice to be sustained over time. Changes in MITI behaviour counts are harder to achieve by physiotherapists, although they report that their language has changed to a ‘new spiel’.

During the course of the six month programme, physiotherapists described a learning journey during which they were able to develop MI skills and incorporate MI

into their own practice style, achieving a ‘new norm’ and improved confidence in working with patients whom they perceived as challenging.

Despite the positive outcomes seen in this study, the level of difficulty in learning MI is high, and it is challenging at first for physiotherapists to change their mindset and develop the new skills required. Additional information has been provided in this study about the diversity of factors which may act as barriers to MI skills development, and strategies which may help to overcome these, such as the use of external support and practice prompts in a systematic way.

Limitations of the methods used in this research have been highlighted and some suggestions have been made for actions which could have been taken to mitigate against these. Despite the limitations, the study also demonstrated considerable strengths which will be presented in Chapter six.

Chapter 6 Conclusion

This section will draw on the findings of the research in Chapter four and its interpretation in Chapter five, to describe the implications the physiotherapy profession, physiotherapy practice and MI training more widely. It will also highlight the strengths of the study and make recommendations for future research.

6.1 Implications for the physiotherapy profession

The findings of this study suggest that the training of physiotherapists in MI can shift the beliefs and practice of physiotherapists from a biomedical, practitioner-centred approach towards a more biopsychosocial person-centred approach to care. If MI training was applied successfully on a larger scale with similar results, the physiotherapy profession may be able to claim justifiably that physiotherapists' practice was in line with the espoused values of the profession to be person-centred and work in partnership with patients.

MI appeared to be acceptable to the physiotherapy participants in this study, who demonstrated high levels of commitment throughout the training period. In fact, their experiences were described as positive and uplifting (section 5.2). This finding may be explained partly by the status of the physiotherapists as willing volunteers with positive motivation levels. The participants in this study stated that they were attracted to MI as a means of developing their knowledge and skills in psychologically informed approaches which they acknowledged were gaps in their practice (section 4.5.2.1).

However, it is the experience of the researcher while training physiotherapists in the field that a small minority of physiotherapists are not ready to engage with MI training and can demonstrate resistance to it, especially when they have been obliged to attend. Adoption and implementation of MI requires physiotherapists to have sufficient professional confidence to move away from the comfort zone of conventional practice, to a more novice position which they may find unsettling and challenging. Although the majority may accept MI training readily and may be prepared to try out unfamiliar skills, a small number may be unable to make the necessary adjustments in their thinking and practice to shift to this new approach. The adoption of MI by physiotherapists also requires a commitment to working with

patients to shift their expectations in relation to their care approach, so they are able to view the care episode as more collaborative and less directive (section 4.5.2.3).

This study identified that changes in MI-consistent practice develop over time, and that ongoing support was required to sustain the impact of the training in the longer term. However, ongoing training in MI and other psychologically informed approaches delivered by external experts is expensive, especially when staff turnover is high. Therefore, the challenge facing MI trainers in this field is how to provide effective yet sustainable training programmes.

Due to the time taken for proficiency to develop, it may take time to deliver the return on educational investment in this field in the form of enhanced clinical and patient-related outcomes. Incentives for service managers to invest in complex practice approaches such as MI are not always immediately obvious. Smarter strategies for delivering and supporting MI training programmes are therefore required. The findings of this study have identified that such strategies could include training physiotherapists in workplace groups, with intermittent external guidance and use of audio-recordings to prompt practice and provide feedback. Over time local expertise can be developed using methods such as train-the-trainer strategies and self-study methods. These training strategies are essential for physiotherapists who work predominantly in a service which is experiencing cuts to non-medical education and training budgets. In due course, and in order to align with the philosophy of the service, the service may wish to consider sufficient knowledge skills in psychologically informed practice as preferential recruitment criteria when employing new staff.

Finally, a greater professional emphasis needs to be placed on physiotherapy education and training to enhance the knowledge and skills required to deliver person-centred care, practise effective communication and use psychologically informed approaches. This would involve developments in pre-qualifying physiotherapy curricula, where psychological content is often inadequate (Heaney *et al*, 2012), and expansion of post-qualifying educational opportunities for graduate physiotherapists. This dual approach to professional education is required to ensure that a more balanced and integrated psychologically informed approach to complex pain conditions, such as persistent LBP, becomes standard practice. This may require the development of a dedicated educational network in physiotherapy, similar to that which exists for medical education in the UK.

6.2 Implications for physiotherapy practice

Training physiotherapists in MI has considerable potential to expand the physiotherapy 'toolkit', that is the knowledge and skills that physiotherapists can apply during their practice. Physiotherapists working with MI within a psychologically informed and person-centred approach are likely to have developed enhanced communication skills which will allow them to work more collaboratively with their patients and empower the patients to take more control of their own management. On a technical level, a raised awareness of the need to soften sustain talk and develop change talk is more likely to result in positive health outcomes (Magill *et al*, 2010; Vader *et al*, 2010). Physiotherapists trained in MI also described feeling more capable of working with challenging patients, resulting in greater professional confidence and lower levels of work stress. This may be helpful for NHS musculoskeletal physiotherapists who tend to have a busy caseload dominated by complex patients with LBP and other persistent presentations.

The main practice challenge in LBP management for physiotherapists is the absence of a recognised assessment approach which incorporates biomedical requirements (such as red flags) yet enhances psychosocial engagement, within a biopsychosocial framework (Sanders *et al*, 2013). The findings of this study have indicated that the use of communication prompts and a template may overcome some of the initial challenges experienced by physiotherapists in putting MI into practice.

As a result of this study, the author has developed an assessment template for physiotherapists as applied to LBP and presented in Table 6.1 in the style of the Calgary-Cambridge Model (Silverman *et al*, 2013). The proposed assessment template populates the middle two columns of the table. An outline of a person-centred MI approach situated in the far-left hand column (Miller and Rollnick, 2013) and a more biomedically-orientated approach in the far-right hand column which represents a standard musculoskeletal physiotherapy assessment such as that outlined in Petty (2011). The template provides a worked example of the style, nature and content of the communication which make take place during a psychologically informed assessment for LBP which incorporates the spirit and processes of MI within a conventional physiotherapy assessment.

Following further development and validation in association with physiotherapy colleagues in practice, the template could be used as a basis for a bespoke ‘script’ for use by physiotherapists once they have undertaken sufficient initial MI training to be aware of the spirit of MI. The template may support a more timely and sustainable development of MI in practice, particularly in relation to the technical aspects of MI unfamiliar to physiotherapists new to this approach, such as cultivating and softening of change talk.

Table 6.1: Proposed assessment template for musculoskeletal physiotherapy – low back pain example

MI APPROACH (Miller and Rollnick, 2013)		**PROPOSED ASSESSMENT APPROACH FOR MSK PHYSIOTHERAPY COMBINING MI APPROACH WITH STANDARD SOAP FORMAT**		**STANDARD PHYSIOTHERAPY ASSESSMENT FORMAT (e.g. Petty, 2011)**
MI Spirit	**MI Process and Skills**	**Combined MI with standard format**	**Prompts**	**SOAP Assessment**
Demonstrate partnership acceptance, compassion, evocation		**Prepare** Have referral data available, include images / diagnostic reports if applicable Prepare safe and professional environment		
	Engage	**Engagement** Establish Rapport Identify and explore reason for consultation and their expectations for the encounter	*What are your thoughts about why are you are here today?* *Tell me a little bit about your back pain?* *What would you like to get from today's session?*	**'S'**
	Use OARS skills and elicit-provide-elicit (E-P-E) **-Information Exchange** **-Advice Giving** **-Asking Permission** **-Checking in** **Listen for change readiness – DARN-C**	**Information** Present complaint **Body chart** – indicate location, severity, irritability and nature of spinal and referred pain as indicated and appropriate **HPC** – and previous management Explore and develop patient understanding, beliefs and attitudes to their condition –using E-P-E **Incorporate PMH / FH / SH / Meds information gathering if possible** **Red Flags – explore/ clarify any positive or unclear information from pre-assessment questionnaire or additional information gained in subjective to date** Unexplained weight loss Night pain	Balance of open and closed questions Use OARS *Tell me a little about your back pain?* *Tell me what you understand about what causes your back pain?* *What options have helped you manage your pain previously?* *Are you happy for me to share with you what we know about back pain and why it sometimes persists?* *What are your thoughts about that? / How does that make you feel?* LISTEN! To responses – DARN-C Cultivate change talk /soften sustain talk as appropriate Ask permission to run through battery of closed Qs if necessary – MI sandwich Develop based on answers where necessary	**Subjective Examination** - Present complaint - Body chart - HPC - PMH - FH - SH - Meds **Red Flags**

Demonstrate partnership acceptance, compassion, evocation		Previous h/o of Ca Fever >50 years of age Violent trauma IV drug abuse Systemic steroids Saddle anaesthesia Difficulty w micturition Progressive neurology Decreased mobility Band-like trunk pain Vague non-specific LL symptoms **Summarise and reconnect with patient** **Gather relevant PMH / FH / SH / Meds information as appropriate if not already developed through previous questioning** **Identify** patient readiness, ambivalence and develop change talk	OARS DARN-C *Is there anything else you would like to tell me about your back which I may have missed?*	
	Focus	**Agenda-mapping** - ID focus of session based on patient presentation, shared discussion and negotiation	*Is it ok if we spend a few minutes exploring what you want to get from today's session?* -or for those in mid-session - *Can we stop for a few moments, so we can take stock of where we are?* *What area / changes would you most like to discuss in our session today?*	Identify main problems
		Physical Examination (as applicable) Observation Joint integrity Functional ability Active physiological Passive physiological Muscle tests Neurological tests Other Palpation Accessory	Keep engaged Ask permission Demonstrate compassion	**'O'** **Objective/ Physical Examination** Observation Joint integrity Functional ability Active physiological Passive physiological Muscle tests Neurological tests Other Palpation Accessory

		Explanation to patient Discuss findings and options for treatment with permission Generate and prioritise problems with patient – with shared understanding	Include E-P-E to establish and confirm understanding	**'A'** **Assessment: Analysis and Problem List**
	Evoke	**Evoke and reinforce intrinsic motivation** Evoke change talk **Ask Evocative Questions** Ask for Elaboration, Ask for Examples Look Back, Look Forward Query Extremes Use Change Rulers Explore Goals and Values Come Alongside	**Evoke for change talk** *Why would you want to make this change? (D)* *How might you go about it, in order to succeed? (A)* *What are the three best reasons for you to do it? (R)* *How important is it for you to make this change? (N)* *So what do you think you'll do? (C)* On a scale of 1-10,	
	Plan	**Planning** Shared treatment planning SMART goals Menu of options for achieving goals	Advise with permission Planning for change: *Are you happy for me to share with you what normally helps people get back on track with their back problem?* *What would be your first steps if you were to imagine starting the exercises / activity / changes to your schedule?* *What barriers may present themselves?* *What solutions could we think about to overcome these?*	**'P'** **Treatment Plan** **ID SMART goals**

Key: **MI approach** **'Standard' physiotherapy approach**

Combined MI and 'standard' physiotherapy approach

6.3 Implications for implementing MI

Although participants described MI as challenging to learn, mainly due to the time and cognitive focus required to incorporate new skills into practice, results suggest that MI may be incorporated successfully into a physiotherapist's practice in a manner which complements their usual communication style and management approach. Time availability does appear to be a particularly important element in encouraging participants to try out MI with patients. This may include the occasional use of longer appointments to allow for additional time to practise MI or additional administration time to catch up on patient notes after trying out MI. The ability to manage one's own diary without undue pressure and the support of a local manager is critical in facilitating practice in this way. Although time was cited as a concern to participants, this tended to be in the early stages of their skill development while they were learning the new approach. Once they had adopted and embedded MI skills within their own practice time seemed less pressured. One individual was able to apply the approach within time-limited musculoskeletal triage appointments with reported success.

Physiotherapists experience challenges in changing from their conventional assessment approach to incorporating MI which is less rigid and requires a change to language style and content. The use of language prompts provided as hand-outs in this study helped to keep them on track during practice as they adopted a new 'spiel' which became embedded as their new norm.

Although this research investigated physiotherapists working with patients experiencing persistent LBP, this study has demonstrated that using MI may also be helpful for physiotherapists working with patients with other singular or multiple musculoskeletal pain conditions or pathologies, but who present with psychosocial obstacles to recovery. The transference of skills to other patient groups was described by physiotherapists in this study (section 4.5.1.3).

Despite the largely successful outcomes demonstrated in the adoption and implementation of MI by physiotherapists according to the global ratings such as MI Spirit, there was little change in the behaviour counts and the more technical aspects of MI. These aspects involve a greater degree of skill and may take additional time and education focus to develop.

In order for MI to be sustained following initial training in physiotherapists, a conducive and supportive service environment is required which invests time in training and values staff development. A psychologically informed clinical environment is also required supports systems to promote patient engagement, collaboration and empowerment. Such systems may include opportunities for greater patient autonomy in service provision and delivery such as patient self-referral and patient control over the scheduling of appointments.

The recommendation of MI as a psychologically informed approach which may be helpful to physiotherapists has been borne out by this study (Foster and Delitto, 2011). As a result of undertaking the training, it seems that physiotherapists develop an enhanced ability to cope with 'difficult' patients and those with complex presentations within challenging caseloads (section 4.5.2.3).

6.4 Strengths of the study

Although studies of MI practice have been carried out with other groups of health care professionals, the training and evaluation of musculoskeletal physiotherapists using motivational interviewing is novel. As highlighted in section 5.9, the quantitative results are not generalisable to the musculoskeletal physiotherapists working in this field; however, the study findings suggest that musculoskeletal physiotherapists can be trained in MI. The qualitative research provides insight into processes through which skills and practice can be developed. This research raises the question of whether MI may have potential for wider utility as a psychologically informed approach within physiotherapy practice, although its impact on patient outcomes has yet to be established.

The research was carried out in an authentic professional environment, involving patients who formed part of the physiotherapy participants' case-loads. The undertaking of the of the audio-recordings in a practice setting provided a more meaningful representation of the therapeutic encounter than self-reported practice intentions based on vignettes (Brunner *et al*, 2016).

Detailed and rigorous data analyses were conducted in this study. The convergent parallel mixed methods design involved the linking and comparison of qualitative and quantitative data sets (Guetterman *et al*, 2015). This facilitated the identification of data convergence and divergence across data sets and the drawing of inferences to provide a

more complete understanding of the research problem (Creswell and Plano Clark, 2011). The mixed methods approach has also provided a better understanding of the implementation and evaluation of the MI training programme over time, identifying some of the potential mechanisms by which physiotherapists transfer MI training into practice during their MI learning journey (section 5.5).

Although measurement of the impact of the MI training programme on patient outcomes was outside of the remit of this study, the impact of the training programme on physiotherapy participants was investigated and explored. The study findings provide insight into the acceptability and effectiveness of an MI training intervention with physiotherapists; research which has not been undertaken previously with physiotherapy participants. The qualitative semi-structured interview data provided new understandings and insights into the experiences of physiotherapy participants undertaking an extended MI training programme, including the meaning they attributed to this experience. The findings have also provided a meaningful understanding of the barriers experienced by physiotherapists to transferring MI into clinical practice. Key enablers included the importance of a supportive infrastructure and the scaffolding of skills development, which may be used to inform future work.

6.5 Recommendations for future research

Based on the findings of this study, there are several areas which could be suggested are worthy of further research. The MI training programme has demonstrated that it has the potential to impact positively upon physiotherapists' practice. It would therefore be useful to repeat and refine the current research by conducting an RCT on an appropriately-powered sample of musculoskeletal physiotherapists. This would demonstrate a more definitive evaluation of the effectiveness of the MI training programme. It would be recommended that the future study would not be restricted to the involvement of persistent LBP patients but would permit recruitment of patients with a range of other morbidities, with a focus on identifying and recognising obstacles to recovery.

The RCT could form part of a mixed methods study which would involve both quantitative and qualitative elements which would allow for a more enriched data set and permit merging of the data across the data sets. Using the new MITI 4.2.1 (subject to adequate validation) or another MI measurement tools would be useful measure and gain a better

understanding of both the technical and relational aspects of using MI in practice (Moyers et al, 2016; Dobber et al, 2015).

The MI training programme content and delivery of a future study would be planned and developed based on feedback from the findings of this research. It may also be useful to utilise a framework to identify key challenges and enablers during the planning phase of the research, such as the Theoretical Domains Framework (Michie *et al*, 2005), the COM-B system or the behaviour change wheel (Michie *et al*, 2011). This would allow strategies to be put into place to overcome barriers and develop enablers prior to and as part of the research process.

The proposed assessment template (Table 6.1) could be piloted to see whether this would be acceptable to a group of physiotherapists who have undertaken MI training previously. If acceptability is established, and following further refinement of the template, the template could be validated as a separate study or as part of further research on MI training with physiotherapists.

Finally, it would be desirable to assess the treatment efficacy of motivational interviewing. This would involve comparing treatment outcomes between patients treated by physiotherapists in control and experimental (training) groups to identify whether there are any associations between the MI-related skills of the physiotherapist and patient outcome. This would also take into account other known and identifiable factors likely to determine or mediate patient outcomes in practice.

6.6 Concluding remarks

This study has achieved its research aim and objectives through a mixed methods study investigating the impact of the MI training programme on the beliefs, attitudes, and practice of musculoskeletal physiotherapists managing persistent LBP. Although the sample size was small, and the quantitative findings are interpreted with caution, the findings within and across both qualitative and quantitative data sets were interpreted and compared. A side-by-side comparison of the findings set out against the research objectives is presented as a joint display in Table 4.13. The findings suggest that participation in a MI training programme can change the beliefs, attitudes and practice of musculoskeletal physiotherapists.

An integrated and person-centred approach is lacking in many physiotherapists working with patients with complex and multi-dimensional conditions such as LBP, due to the dominating biomedical dominance within physiotherapy culture and practice, and the biomedical focus within physiotherapy education (Synnott et al, 2015; Gray and Howe, 2013; Heaney *et al*, 2012). The findings of this mixed methods study suggest that participation in a MI training programme can develop and change the mindset and practice of traditionally biomedically-focused musculoskeletal physiotherapists towards a more behavioural and person-centred orientation. Physiotherapists in this study were able to integrate both biomedical and psychosocial approaches to practice over the course of the training programme. This integration allowed physiotherapists to fulfil their professional responsibility of identifying and recognising serious spinal pathology (red flags) and to work with patients to identify and overcome physical and psychosocial barriers to recovery.

The focus of MI training on developing awareness of the MI spirit, goal-orientated communication and person-centred practice, appeared to resonate with physiotherapists in this study. Although challenging at first, physiotherapists were able to work individually and collectively to develop their skills and change their practice over time. Physiotherapists were able to incorporate MI into their own approach to practice which enhanced their capability and confidence in working with patients they perceived as challenging.

Although the findings of this study suggest that training physiotherapists in MI can have an impact on their mindset and behaviour, further research is indicated to establish whether results can be repeated in a larger and adequately-powered sample of physiotherapists and whether practice changes are sustained in the longer term. In order for MI to be recognised and fully accepted as a psychologically informed approach for use by physiotherapists, research is required to see whether MI is acceptable to patients and whether it has an impact on patient outcomes.

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Appendices

Appendix 1: Literature search categories and search terms

Literature Search Process:

Step 1: Relevant academic databases identified

Step 2: Focused searches – each search term was entered in turn as a key word in the Title field within the search of databases.

Boolean search operator 'AND' was used to combine each of the keywords search terms with additional search terms (in any field) as indicated in the table below.

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
Question 1: To what extent do physiotherapists use psychologically informed approaches?								
Linked to question 1: psychologically-informed physiotherapy	biopsychosocial	AND physioth*	37	4	4 (4)	George, 2008	Systematic Rev	LBP
						Hurley *et al,* 2000	Cross-sectional study of utility of BPS questionnaire N=116, Northern Ireland	LBP
		AND physical therapy	82	4		Wand *et al,* 2004	Single blind RCT Educ, MT and Ex N=102 , 6/52, 3/12, 6/12 outcome Control of assess/advise/wait. Treat better long term outcomes	LBP
						Wijma *et al*, 2016	Practice guide – based on published research and clinical experience	Chronic pain
	psychologically informed	AND physioth*	5	2	5 (2)	Main and George, 2011	Practice guide – evidence and professional experience	LBP
						Nicholas and George, 2011	Practice guide - evidence and professional experience	LBP

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
		AND physical therapy	7	5		O'Keeffe *et al*, 2016	Systematic Rev and MA 24 papers	Spine
						Russek and McManus, 2015	Practice guide - evidence and professional experience	Chronic pain
						Wilson *et al*, 2017	Qual study IPA patient experience 3/12 post Rx N=8 national specialist centre UK (residential)	Chronic pain
	communication	AND physioth*	189	7	9 (4)	Ambady *et al*, 2002	Clinical -Link non-verbal behav and efficacy – correlation 48 clients, 11 PTs Physical / cogn / psych outcomes admission and DC Coding NVB 6 raters	Geriatric (inpatient)
						Hiller *et al*, 2016	Qual ethnographic private PT comm N=52 sessions, 11 PTs	Range
						Jeffels and Foster, 2003	Syst rev patient experience PT comm	Pain
						Øien *et al*, 2011	Qual comm - Multiple case study, pattern	Spinal pain
		AND physical therapy	198	6		Oliveira *et a*l, 2012	Syst review Comm values patient autonomy	Primary care / rehab – non-specific
						Parry, 2004	Clinical - Conversation analytic study goal setting	Stroke rehab
						Pinto *et al*, 2012	Syst review,Pt-centred comm and therapeutic alliance	Primary second, tertiary care settings- non-

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
								specific
						Roberts *et al*, 2013	Cross-sectional study PT communication	LBP
						Włoszczak-Szubzda and Jarosz, 2013	Cross - sectional study - Comm competences of PTs -questionnaire	Non-specific
	person-centred	AND physioth*	9	1	2 (0)	Feldthusen *et al*, 2016	RCT - Person-centred PT and RA. Balancing /partnership	RA
	person-centered	AND physical therapy	9	1		Mudge *et al*, 2014	Qual - Auto-ethnography PTs views PCC – recognition.	Neuro rehab
	therapeutic alliance	AND physioth*	4	1	2 (1)	Ferreira *et al*, 2013	Clinical quant - Patient rated alliance effects on outcomes N=7, PTs, n=182 pts	LBP
		AND physical therapy	5	2		Fuentes *et al*, 2014	Clinical - Effects TA on outcomes –quant-controlled study N=117, 7 groups – IFT with limited or enhanced TA	LBP
	cognitive behavioural	AND physioth*	98	9	12 (6)	Archer *et al*, 2013	Clinical – telephone-delivered CBT intervention within PT – case series N=8	Spinal surgery
						Beissner *et al*, 2009	Cross sectional Survey Use of CBT by PTs N=152 (88%RR)	Older adults
						Brunner *et al*, 2013	Syst Rev – CBT LBP prevention	LBP
						Ferrari *et al*, 2016	Clinical - CBT and pain self-efficacy - case series N=10	Lumbar spondylolisthesis

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
						Green *et al*, 2008	Qual - Observational study -PT use of CBT N=8, SFA vs McKenzie	Spine
						Harding and Williams, 1998	Practice guidance - Integ CB PT – prog outline	Chronic pain
						Johnson *et al*, 2007	RCT – group active ex and CBT	LBP
	cognitive behavioral	AND physical therapy	106	9		Johnstone *et al*, 2004	RCT CBT	LBP
						Nielsen *et al*, 2014	Qual - PTs experiences of delivering pain coping skills training over 12/12 N=8	Knee OA
						Soderlund and Lindberg, 2001	RCT – CBT within PT N=33	Whiplash AD
						Thompson *et al*, 2016	RCT – CB PT patient outcomes N=57	Neck pain
						Zusman *et al*, 2005	Practice guidance -role of non-physical intervention	MSK PT
	cognitive functional therapy	AND physioth*	13	5	5 (4)	Bunzli *et al*, 2016	Cross-sectional, qual patient perspectives N=14 Ireland and Australia	LBP
						Cañeiro *et al*, 2013	Clinical - Case study	LBP
						O'Sullivan *et al*, 2015	Clinical - Multiple case cohort	LBP
		AND physical therapy	24	4		Van Hoof *et al*, 2011	Clinical - Case study	LBP
						Vibe Fersum *et al* 2012	RCT - Outcomes CFT vs MT and ex N= 121 Several limitations	LBP
	neurophysiology education	AND physioth*	4	0	0 (0)			

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
		AND physical therapy	3	0				
	motivational	AND physioth*	47	6	6 (3)	Cheing *et al*, 2014	Clinical - Path analytic - analysing effects of MET	Pain
						Holden *et al*, 2015	Cross-sectional survey Motivational strategies PTs in Australia N=170	LBP
						McGrane *et al*, 2014	Practice guidance / review – motivational strategies for PTs	N/A
						Pignataro *et al*, 2015	Practice guidance Position paper – MI and physiotherapy	N/A
						Reid *et al*, 2011	RCT - Motivational counselling for PA N=141 patients, 3 trained PTs	Coronary artery disease
		AND physical therapy	25	3		Vong *et al*, 2011	RCT - MET 6 PTs, N=76 patients	LBP
Totals			**865**	**69**	**45 (24)**			
Question 2: What factors enable/inhibit the adoption of MI in health care practice?								
Linked to question 2: motivational interviewing	Motivational interviewing	AND training	689	25	30 (6)	Baer *et al*, 2009	Randomised eval – MI vs context tailored training N=144 staff across 6 agencies	Community counsellors / substance abuse
		AND experience	207	11		Barwick *et al* 2012	Syst Rev – training 17/22 studies sign behave change	Mental Health Professionals
						Bohman *et al*, 2013	Training evaluation n=36 Limited proficiency.	Nurses children's services

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
							3.5/7 workshop plus 11 week supervision. Control not analysed.	
						Bonde *et al*,2014	Qual – interviews Experiences MI N=12 I year after MI training	School nurses / childhood obesity
						Brobeck *et al*, 2011	Qual - Experiences of MI N=20	Primary health care nurses/ health promotion
						Carpenter *et al*, 2012	Evaluation 3 approaches - assoc clinician characteristics n=58	Addiction clinicians
						Cook *et al*, 2016	Post-training evaluation Q – 10 years interp training n=394,	Range, including PTs
						Curry-Chiu *et al*, 2014	Qual experiences - MI N=9	Dental hygienists
						Decker and Martino, 2013	Multi-site study. Clinician characteristics / attitudinal variables vs adoption N=92 clinicians	Substance abuse
						Dickinson *et al*, 2006	Qual - Factors affecting adopt and sustain MI after training N=5 agencies	Addiction / substance abuse
						Duff and Latchford, 2013	Eval- quant and qual MI use, barriers and facilitators n=73, 11 interviewed Incl PTs – for CF	Range
						Forsberg at, 2010	Exploratory Acq and retention MI – 2.5 years n=3	Counsellors – Smoking cessation
						Hall *et al*, 2016	System review – sustaining practice and outcomes	Substance Use Disorder

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
							15 studies	
						Hirdle and Vaughan, 2016	Impact training on practice, suggestions for strategies. Post training Q n=100	Health visitors
						Laws *et al*, 2015	Coded MI episodes post training – factors affecting adherence N=38 professionals, 87 encounters	HIV physicians, PA and Nurse Practs
						Lindhardt *et al*, 2015	Qual – factors affecting implementation N=11	Midwives / obstetricians /nurses Obese pregnant women
						Madson *et al*, 2009	Syst review – MI training, incl transfer of training 27 studies	Range – healthcare, not PT
						Midboe *et al*, 2011	Eval - Role of provider characteristics in implementing MI N=229	Primary care providers, not PTs
						Moore 2012	Eval – quant and qual Integration MI into practice foll workshop in National Ex Ref scheme N=27	Exercise professionals
						Ostlund *et al*, 2015a	Coded MI sessions plus post MI Qs of experiences n=12 nurses, 32 patient sessions	Primary care nurses
						Ostlund *et al*, 2015b	Qual – experiences – MI, incl barriers N=20	Primary care nurses
						Ostlund *et al*, 2014	Questionnaire - ID use and factors affecting use following training N=980	DNs / nurses

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
						Rubak, 2006	RCT- ID use of MI post-training - Q n=65	GPs
						Schumacker *et al*, 2014	Barriers to learning MI- survey of N=146	MI trainers
						Schwalbe *et al*, 2014	Meta-analysis – sustaining MI following training 21 papers	Range
						Soderlund *et al*, 2011	System rev MI training 10 papers	HCPs – range
						Soderlund *et al*, 2009	Qual Focus gps experiences with MI – ID barriers N=10	Welfare centre and School Nurses
						Soderlund *et al*, 2008	Qual Interviews exploring experiences in learning and applying MI after 1 year N=20	Primary health care nurses
						van Eijk-Hustings *et al*, 2011	Eval - Implementation MI –obj measures – MITI and subj. Interviews both groups - facilitators and barriers N=20 – 2 groups	Diabetes care – nurses and dieticians NL
						Wood *et al*, 2011	Qual – factors affecting adoption MI – trained and untrained SS interview QCA N=20	Health /social care - substance abuse
Totals			**896**	**36**	**30 (6)**			
Question 3: **What measures are used to assess implementation/adoption of MI practices?**								
Linked to question 3: measurement	Motivational interviewing	AND measure	450	13	10 (3)	Barsky and Coleman, 2001	Development MI Process Code (13 items) and Dysfunctional Skills Code (12 items)	Graduate Social Work students in Canadian University

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
of motivational interviewing							Delphi for design and interobserver rating for testing Delphi – n=11, Inter-observer – n=8 Interobserver MIPC 51%, DSC 75%	
						Campiñez Navarro *et al*, 2016	Devt and validation of Motivational interviewing assessment scale (MIAS – 14 items) Delphi – n=16 design and devt MI experts rated 22 video recordings Global ICC inter and intra-rater >0.91, Cronbach's alpha>0.91 Correl with BECCI	Primary HC physicians in Spain
						Copeland *et al*, 2017	Developed Tool for coding of MI planning – lit rev and thematic analysis Reliability rated – 50 sessions N= 10 testers Cardiff Uni staff % agreement – 86% plans and goals, 75% transcript reliability	Weight loss patients Cardiff, UK
						de Jonge *et al*, 2005	MISC Reliability tested – 5 coders, 39 sessions, ICC 0.06 - 0.44	Social workers / counsellors role-play as CPD in NL
						Dobber *et al*, 2015	Systematic search – ID instruments measuring active ingredients of MI 7 - 3 measured active	Non-specified

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
							ingredients – relational -SCOPE / MISC; technical- GROMIT/ MISC 2	
						Jelsma *et al*, 2015	Practical guidance – Measure MI Fidelity Focused on MITI	Non-specified
						Forsberg *et al*, 2008	Validity of Swedish MITI (2003) Construct and discriminant validity 30 sessions tobacco, 30 sessions substance abuse, 14 pairs of coders Positive findings	Tobacco cessation Substance abuse
		AND tool	159	5	2 (3)	Lane *et al*, 2005	Reliability, validity and responsiveness of BECCI (adaptation of MI) Developed from lit rev and experts 11 items, 5 pt Likert Inter-rater – 0.79/0,93, intra-rater – 0.66/0.90	Smoking Diabetes Brief behaviour change UK
						McMaster and Resnicow, 2015	Psychometric properties of Onepass – MI fidelity and supervision tool 23 items, 7 pt Likert scale And comparison vs MITI N=27 tapes, 3 raters of Onepass and 3 of MITI Inter-rater rel 0.82, of MITI -0,7 to 0.63 overall Good correlation Onepass and MITI Used standardised patients	Simulated patients – smoker / overweight

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
						Madson *et al*, 2005	Development and psychometric evaluation MISTS, and convergent validity with YACS MISTS – 16 items, 7 pt Likert, 3 raters sample 50 audiotapes ICC general good,poor convergent valid, Needs more eval.	Substance abuse - US
						Moyers and Martin, 2003	Integrity of MISC 86 sessions, 2 coders ICC good – global, less good behave,	Smoking cessation Univ Kansas
		AND language	109	1	1	Moyers *et al*, 2016	Validity and reliability MITI 4 – 4 raters – coded 50 audiotapes from practice Generally good – excellent – (not auton. % CR) Reliable -technical and relational	Substance abuse – New Mexico
						Petrova *et al*, 2015	Development and psychometric testing Motivational Interviewing Skills for Health Care Encounters (MISHCE) – 15 items Cronbach's alpha 0.75 overall from for 5 raters - 18/88 role-play interactions ICC maj good to excellent	Health and social care professionals – role plays with range of chronic diseases US
						Pierson *et al*, 2007	Reliability of MITI – 206 tapes, 9 raters across 4 groups (8-students), ICCs role plays – good to	Substance abuse Univ Nevada

Search Categories	Search Terms	Additional search terms using Boolean Operators	Identified	Included	Total (duplicates)	Combined results for search terms	Brief description	Region / subject
							excellent overall – global and behave counts	
						Rosengren *et al*, 2008	Reliability and validity VASE-R N=144 subst abuse practitioners, n= 66 MI trainers ICC 0.85 overall -VASE-R Strong converg validity HRQ and MITI Sensitivity to improvement	1. Substance abuse 2. MI trainers US
						Wallace and Turner, 2009	System review Psychometric eval MI measures Included MISC, MITI, MISTS, VASE, MIPC Findings variable -been superceded by later studies	Unspecified
	Center on Alcoholism, Substance Abuse, and Addictions (CASAA) website	Tools	9	1	1	Martin *et al*, 2005	Motivational Interviewing Sequential Code for Observing Process Exchanges (MI-SCOPE) Coder's Manual	Substance abuse
						Miller *et al*, 2008	Manual for the Motivational Interviewing Skill Code (MISC) Version 2.1	
						Moyers, 2004	Global Rating of Motivational Interviewing Therapist (GROMIT) Research Instrument	
						Moyers and Martin, 2006	Feasibility study of SCOPE in Project MATCH	Substance abuse
Total			**727**	**23**	**20 (3)**			

Appendix 2: Letter of invitation to physiotherapy managers

Date

Dear XXXXXX,

Re: The effects of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists

Researcher: Lesley Haig MSc, Grad Dip Phys, MCSP

I am writing to ask you whether you will allow permission for the physiotherapists in your department to be approached to participate in a research study that I am conducting as part of a Professional Doctorate in Physiotherapy at London South Bank University.

The rationale for the study is based on emerging work you will be familiar with over recent years which has recommended that persistent LBP should be managed using a multi-modal approach, with higher levels of awareness of psychosocial issues. Research carried out to date on the use of psychologically informed interventions by physiotherapists (such as cognitive behavioural therapy and pain management programmes) as part of their approach to LBP management, has yielded some promising results, although the quality of the research is variable.

Despite the recent guidance, the biomedical model appears to persist among many physiotherapists in LBP management. The reasons for this are unclear but biomedical orientation has been associated with age, educational experience, and the competence and confidence of physiotherapists in their skills in applying psychologically informed interventions. In addition physiotherapists' attitudes and beliefs during treatment can influence patient management and outcome, which in itself is not necessarily in line with recommended clinical guidelines.

Studies investigating physiotherapists' experiences of managing chronic LBP have recommended that training should be focused on improving their communication skills, developing their confidence and competence in managing challenging consultations, and enhancing physiotherapist-patient collaboration. It is clear that whatever psychologically informed approach is used, physiotherapists must feel confident and capable of putting this into practice.

One approach which has received increasing interest in health care management over recent years is motivational interviewing (MI). MI is a patient-centred counselling approach which is used to elicit and promote behaviour change. The approach focuses on providing strategies for enhancing communication, in particular to facilitate the patient's own motivation for change by exploring and resolving ambivalence to change. Reviews of MI practice have demonstrated that this

technique has significant clinical potential across a range of chronic health conditions although it has yet to be used widely by physiotherapists.

Although training workshops in MI are frequently offered for physiotherapists in the United Kingdom and overseas, research is lacking into both the training of physiotherapists in MI, and the subsequent delivery of MI in practice particularly in relation to LBP management.

Given the evidence gap regarding the impact on MI training in physiotherapists, and the potential this approach has to extend the physiotherapists' 'toolkit', this research has been designed to consider the impact of an MI training programme on:

- The attitudes and beliefs of physiotherapists (measured by 2 brief questionnaires);
- MI-consistent behaviour by physiotherapists (as represented by physiotherapist language during audio-recorded patient consultations and coded against a validated scale).

The research also aims to explore the factors affecting the translation of training into physiotherapy practice.

The MI training programme will provide an initial 2-day baseline training in MI and regular monthly follow-up coaching sessions for six months to develop the relevant skills and confidence required to deliver an MI-consistent communication style during treatment sessions. Physiotherapists participating in the programme will be expected to attend the 2-day training and follow-up sessions, to complete the questionnaires and provide recordings of 2 initial patient assessments at baseline, 3 and 6 months.

The training programme is provided free of charge. Physiotherapists will be allocated into 2 Groups (A and B) on a first-come, first-included basis. Group A will be the intervention group and Group B the comparison group. Group B physiotherapists will be provided with an opportunity to undertake the MI training programme after the data collection phase has been completed (at 6 months).

About me:

I am a Chartered Physiotherapist, registered with the Health and Care Professions Council (HCPC), with over 20 years of clinical experience, and 10 years' of educating health care practitioners in higher education at undergraduate and postgraduate level. I have held clinical roles in the NHS and private practice. I have been based in Universities for over 10 years, in academic, clinical and managerial roles. Over the past decade I have developed an increasing interest in the role of psychosocial factors within pain management.

I am undertaking the Professional Doctorate in the Faculty of Health and Social Care at London South Bank University. The main supervisor for the study is Professor Nicola Crichton, Pro-Dean Research, in the Faculty of Health and Social Care.

This research will be written up as a doctoral thesis. The research proposal has been submitted to the University's Ethics Committee for approval.

Many thanks for considering this request. If you would be happy for the physiotherapists in your department to participate please confirm this is an email or letter to the following, or please do not hesitate to call me to discuss the research further:

Lesley Haig, c/o St Mary's University College, Waldegrave Road, Twickenham, TW1 4SX Email: lesley.haig@smuc.ac.uk Tel. 02082404219

Kind regards,
Signature

Appendix 3: Participant Information Sheet (PIS) for physiotherapists for main study

PARTICIPANT INFORMATION SHEET (PHYSIOTHERAPISTS)

Title: The effect of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists
Researcher: Lesley Haig MSc MCSP

You are being invited to take part in research being carried out as part of a doctorate in physiotherapy. Before you decide whether to take part it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

What is the purpose of the study?
As musculoskeletal physiotherapists we are often faced with challenging low back pain patients. We make good use of our knowledge, our clinical experience and recent clinical evidence to make sense of the patient's presentation and in planning the treatment strategy. In addition research studies have shown that the treatment approach we take as physiotherapists can be influenced by our health beliefs and attitudes.

It has become acknowledged increasingly that psychosocial factors play an important part in a patient's transition from acute to chronic non-specific low back pain. This is especially important when patients demonstrate maladaptive behaviour and poor coping strategies. As a result psychologically informed interventions have started to form part of the toolkit of many physiotherapists in the management of persistent LBP alongside usual care.

One approach which has received increasing interest in health care management over recent years is motivational interviewing (MI). MI is a patient-centred counselling approach which is used to elicit and promote behaviour change. Reviews of MI practice have demonstrated that this technique has significant clinical potential across a range of chronic health conditions although it has yet to be used widely by physiotherapists.

The aim of this study is to investigate the effects of a LBP-focused motivational interviewing (MI) training programme on the behaviour, attitudes and beliefs of physiotherapists. Part of this study also involves exploring the experiences of physiotherapists in implementing a MI approach into clinical practice. Data collected during this study will help the researcher to gain a better understanding of the impact of MI training on physiotherapists and the factors affecting its use in clinical practice.

Why have I been chosen?
You have been chosen because you are currently employed as a physiotherapist in an NHS outpatient setting, you have persistent low back pain patients in your

caseload, and you have not received formal training previously in motivational interviewing.

Do I have to take part?
It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. If you do decide to withdraw from the study, you should let the Chief Investigator know and your information and data (including audio-recordings) will be destroyed securely. This is only possible up to the date of submission of the doctoral thesis (around March 2015) since the information and data will contribute to the results included in this work.

What will happen to me if I take part?
If you decide to take part, you will be asked whether you are available for the initial 2-day MI training programme. If you are available for the initial programme you will be allocated to Group A on a first-come, first included basis. If you are not available for these sessions or Group A has its full allocation, you will be allocated to Group B, the later training group, and you will be offered training at a later date (six months' later).

What do I have to do?

All participating physiotherapists (Group A and B) will be asked to do the following:

- To complete an initial questionnaire outlining relevant details about your professional background;
- To rate your baseline current proficiency in using MI;
- To complete 2 questionnaires about your attitudes and beliefs about chronic low back pain at the start of the study, and to repeat this 3 and 6 months' later. The questionnaires will take about 15 minutes to complete.

If you are in Group A you will be involved in an MI training programme as follows:

- Attending an initial 2-day course in MI for persistent LBP. The 2- day course will be approximately 16 hours long with one day of training delivered in work time and the other in the physiotherapists' own time. This course will involve both theory and practice components and give you a chance to practice essential communication skills in small groups before with each other before using them with patients. The course will be held in west London and overseen by a qualified MI trainer;
- To help support you in developing your MI skills, monthly coaching sessions (individual or group) each up to 45 minutes long will take place with the researcher at your place of work and during your working day over a 6-month period. In order to help the researcher provide more effective guidance and feedback at these sessions, you will be asked to provide audio-recordings of patient treatment sessions which can be reviewed against a brief behaviour change coding index (BECCI), and to rate on a visual analogue scale your proficiency, confidence and intention to use the MI approach;
- In order to see whether the training programme influences your MI skills, you will be asked to provide 6 audio-recordings of initial assessments with patients referred for physiotherapy who have persistent non-specific LBP– 2

before the initial course, 2 three months' later, and 2 six months' later. A 20 minute section of each recording will be scored against a recognised checklist for MI behaviour. The average score will be used as the main tool to assess the presence of MI behaviour before and after training.
- After 6 months you will be asked to participate in an interview which will explore your experiences of the training programme and of implementing MI into clinical practice.

Overall Group A physiotherapy involvement will up to 34 hours over a 6 month period as follows: up 22.5 hours of instruction, training or coaching; up to 2.25 hours completing data collection tasks including questionnaires and an end of study interview; and up to 9 hours (12 patient sessions) of making audio-recordings (as part of main study data and to inform coaching sessions).

If you are in Group B:
- You will be asked to provide 6 audio-recordings of initial assessments with persistent LBP patients – 2 at the start of the study, 2 three months' later, and 2 six months' later. This will provide a comparative measure for Group A physiotherapists who are undertaking the MI training programme.
- You will be given an opportunity to undertake an MI training programme at a point 6 months after the Group A training has taken place.

Overall Group B physiotherapy involvement will up to 6.65 hours over a 6 month period as follows: up to 1 hour of instruction; up to 1.15 hours completing data collection tasks including questionnaires; and up to 4.5 hours (6 assessment sessions) of making patient recordings (as part of main study data).

All physiotherapists will be provided with a digital recorder to make the audio-recordings and you will be instructed in how to use this. You will also need to ask your patients for permission to make recordings for training purposes and to note this in your treatment records.

What is the procedure that is being tested?
MI is a client-centred style of communication which has been developed to promote behaviour change. This approach has demonstrated some success to date in improving patient outcomes in other non-physiotherapy health care fields such as dietary modification and smoking cessation.

The use of a motivational interviewing approach in this study is not intended to replace other treatment approaches you use, but following the training you may find the MI approach useful in promoting a patient's behaviour change where this is indicated. This does not mean that the treatment sessions will be longer, but the training may influence the way that you communicate with your patients.

What are the possible benefits of taking part?
The MI training will provide an opportunity for you to develop knowledge and skills in a growing and relevant field as part of your CPD portfolio. Although this programme is tailored to low back pain patients, it may help to improve communication skills relevant for promoting behaviour change in a range of clinical conditions that may be encountered during your work. Ultimately it is hoped that using an MI approach as part of your toolkit may help generate improved patient outcomes.

The information generated from your participation will help me to identify the effectiveness of MI as a tool for physiotherapists, and may influence the way that physiotherapists get trained in future.

The training programme is provided free of charge.

Will my taking part in this study be kept confidential?
All information which is collected about you during the course of the research will be kept strictly confidential. Any information about you which is shared with others (eg. in reports and publications) or is shared with an academic supervisor will have your name and address and any identifying information removed so that you cannot be recognised from it. The identity of your patients involved in the audio-recordings will be protected as you will not be asked to share their identity with the researcher at any time. You will be required to ask the patient to consent to the audio-recording for training purposes, and to note this in your treatment notes. An information sheet will be provided for you to give your patients to explain what the research is about and why you are asking for their consent. The researcher will not have access to the patient's treatment notes or medical records.

All paper based data will be kept in a locked cupboard. Electronic data will be kept on a password-protected computer. The audio-recordings will be anonymised and stored digitally on a password protected computer. The audio data will be kept until the research has been written up fully, and retained for a further period to allow for examination and resubmission of the doctoral thesis. Any other data that is personally identifiable will be destroyed securely by the end of December 2016. Anonymised data will be retained and stored confidentially to allow for a period of report production and publication up to 5 years after data collection.

What will happen to the results of the research study?
The results of the study will be reported as part of a thesis for a doctoral degree. It is also intended that the results will be published in journals after 2014. If that is the case then you will not be identified personally in any report. If you are interested in finding out the results of the study please contact Lesley Haig after the study has been completed in summer 2015, who will be pleased to provide you with a summary report.

Who is organising and funding the research?
This research is sponsored by London South Bank University.

Who has reviewed the study?
This study has been reviewed and approved by the Proportionate Review Sub-Committee of the National Research Ethics Service London – City and East (REC Reference 14/LO/2274, IRAS Project ID 71363) and the London South Bank University Ethics Committee (UREC 1407)

If you have any questions or require further information about this study please contact:
Chief Investigator: Lesley Haig on 07973772643 or e-mail: haigl@lsbu.ac.uk

If you have any concerns about the conduct of this student please contact:
Supervisor: Professor Nicola Crichton on 02078156742 or e-mail: crichtnj@lsbu.ac.uk

If you would like to contact someone not related to the study about this research please contact:
London South Bank University Research Ethics Committee at: ethics@lsbu.ac.uk

Appendix 4: Participant consent form for physiotherapists for main study

PHYSIOTHERAPIST CONSENT FORM

The effect of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists

- I have read the attached information sheet on the research in which I have been asked to participate and have been given a copy to keep. I have had the opportunity to discuss the details and ask questions about this information.
- The Investigator has explained the nature and purpose of the research and I believe that I understand what is being proposed.
- I understand that my personal involvement and my particular data from this study will remain strictly confidential.
- I have been informed about what the data collected in this investigation will be used for, to whom it may be disclosed, and how long it will be retained.
- I have been informed that I will need to audio-record six treatment sessions with patients with their consent to be used as part of the study data.
- I understand that I am free to withdraw from the study at any time, without giving a reason for withdrawing.
- I hereby fully and freely consent to participate in the study.

Participant's Name:(Block Capitals) …….

Participant's Signature: …….

Date: …….

As the Investigator responsible for this investigation I confirm that I have explained to the participant named above the nature and purpose of the research to be undertaken.

Investigator's Name: …….

Investigator's Signature: …….

Date: …….

If you have any questions or require further information about this study please contact:
Chief Investigator: Lesley Haig, on 07973772643 or e-mail: lesley.haig@smuc.ac.uk

If you have any concerns about the conduct of this student please contact:
Supervisor: Professor Nicola Crichton, on 02078156742 or e-mail: crichtnj@lsbu.ac.uk

Appendix 5: Participant Information Sheet (PIS) for patients

PATIENT INFORMATION SHEET

The effects of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists

You are being asked to give permission to have your physiotherapy session audio-recorded for training purposes. Before you decide it is important for you to understand why you are being asked to do this and what it will involve. Ask your physiotherapist if there is anything that is not clear or if you would like more information.

Why is the session being recorded?
Your physiotherapist is taking part in some doctoral research which is looking at the effects of training physiotherapists in a type of communication called motivational interviewing. All physiotherapists in the study are asked to provide several audio-recordings of sessions with patients who have persistent low back pain for training purposes. These recordings are then reviewed by the researcher who will not know who you are, and will have no contact with you, to assess your physiotherapist's communication style.

Why have I been chosen?
You have been chosen because you have been referred for physiotherapy treatment for your low back pain. You are also over 18 years old, and have persistent low back pain; that is you have had pain for more than 6 weeks and less than 12 months.

Do I have to consent?
It is up to you to decide whether or not you are happy for your session to be audio-recorded. If you do decide to allow the recording to take place you will be given this information sheet to keep and your physiotherapist will make a note in your treatment record that you were happy for the session to be recorded. You are still free to withdraw at any time without giving a reason.

What will happen to me if I take part?
Your initial assessment session will be audio-recorded using a digital recorder. This recording will be assessed by a researcher who does not know who you are.

It is important that you are aware of the following:
1. The review of the recording is focused on the physiotherapist's words and responses – your words will only be used to help rate the physiotherapist's responses;
2. Your identity will not be made known to the researcher who will be analysing the recording;
3. The researcher will not have access to your treatment notes or medical records;
4. No details of your treatment or medical condition will be requested or used in any way by the researcher;

5. The audio-recording will be kept securely on a password protected computer and deleted once the researcher has completed her doctorate.

What do I have to do?
You will continue with your treatment as usual. There is nothing extra you will need to do.

What are the possible benefits of taking part?
There are no direct benefits to you here. However the results we get from this study may help us to develop approaches that may help the way back pain is managed in the future.

Will my taking part in this study be kept confidential?
Your identity will not be known by the researcher at any stage. The audio-recordings will be stored electronically on a password protected computer. The audio-recordings will be kept securely until the research has been written up fully, and retained for a further period to allow for examination and resubmission of the doctoral thesis. After this the recordings will be destroyed securely – this should take place by the end of December 2016.

What will happen to the results of the research study?
The results of the study will be reported as part of a thesis for a doctoral degree. It is also intended that the results will be published in journals after 2014. If that is the case then you will not be identified personally in any report.

Who is organising and funding the research?
This research is sponsored by London South Bank University and the researcher is a qualified physiotherapist named Lesley Haig, who is carrying out this research as part of her doctoral degree.

Who has reviewed the study?
This study has been reviewed and approved by the Proportionate Review Sub-Committee of the National Research Ethics Service London – City and East (REC Reference 14/LO/2274, IRAS Project ID 71363) and the London South Bank University Ethics Committee (UREC 1407)

If you have any questions or require further information about this study please speak to your physiotherapist, who can contact the researcher on your behalf to maintain your anonymity.

Appendix 6: Patient pre-treatment questionnaire of participating Trust

Please complete both sides of this form as completely as possible before your assessment.

Name:..... **Date of Birth:** .....

1. What is your problem?

2. When did it start?

3. How did it start?

4. How does it affect you?

2. How long have you had this problem?

Days ☐ Weeks ☐ Months ☐ Years ☐

3. Is the problem:

New ☐ Flare-up of old problem ☐ Ongoing ☐

Please give details:.....

4. Is your problem

Getting better ☐ Getting worse ☐ Staying the same ☐

5. Have you had any investigations for this problem? (E.g. Scans, X-rays, Blood tests)

Yes ☐ No ☐

If **YES** please give details.....

6. Have you had any previous treatment for this problem? (E.g. Medical treatment, Physiotherapy, Osteopathy, Chiropractor)

Yes ☐ No ☐

If **YES** please give details including **WHERE & WHEN**

.....

7. Please describe your general health?..... **Have you unexpectedly lost weight?** .....

Please indicate if you have any of the following conditions:

Epilepsy	YES ☐ NO ☐	Diabetes	YES ☐ NO ☐
Inflammatory Arthritis	YES ☐ NO ☐	Heart / blood pressure problems	YES ☐ NO ☐
Lung problems	YES ☐ NO ☐	Any Surgery/Operations	YES ☐ NO ☐
Osteoarthritis	YES ☐ NO ☐	Any other joint problems	YES ☐ NO ☐
Any major illness	YES ☐ NO ☐	Previous Fractures	YES ☐ NO ☐
Other medical problems	YES ☐ NO ☐	Stroke	YES ☐ NO ☐
Osteoporosis (brittle bones)	YES ☐ NO ☐	Allergies	YES ☐ NO ☐
Cancer	YES ☐ NO ☐	Thyroid problems	YES ☐ NO ☐
Hospital acquired infection	YES ☐ NO ☐	TB	YES ☐ NO ☐

Please give details.....

8: Please list any medications you are taking.....

.....

Have you ever taken the following:

Steroids Yes ☐ No ☐ Anticoagulants e.g Warfarin Yes ☐ No ☐

9: Employment Status: are you.

Employed ☐ Unemployed ☐ Retired ☐ Student ☐ Carer ☐

Please give details:.....

10: Please give details of any active hobbies you do (e.g. Sports or other)

Please give details...:.....

.....

11: Due to your current problem are you <u>unable</u> to?

Work ☐ Play sport ☐ Care for a dependent ☐ Other ☐

Please give details:.....

.....

12. GOALS of physiotherapy.

The Patient-Specific Functional Scale

Identify three important activities that you are unable to do or are having difficulty with as a result of your problem, and then score each activity between 0 (unable to perform activity) and 10 (able to perform activity to same level as before injury or problem).

Unable to perform activity	0	1	2	3	4	5	6	7	8	9	10	Able to perform activity at the same level as before problem

Activity	**Score**	Office use: GOAL	Office use: post score
Example*: Walking more than 10 minutes*			
Activity 1			
Activity 2			
Activity 3			

13: I ..... confirm that the information provided above is correct to the best of my knowledge. I give my consent to the physiotherapy assessment and treatment of my problem and to communication on the above. (This may be withdrawn at any time) A copy of your discharge summary will be sent to your GP. Please note we will use an electronic record system for your notes unless you specify otherwise.

Patient Signature ..... **Date:**.....

Appendix 7: MI course outline

MI Course Content Outline – 22nd and 23rd July 2015

Day 1 – 22nd July 2015

- Introductions
- Expectations of the course
- Exploring and reflecting on personal examples of behaviour change failure
- What MI is and what it isn't
- Relationship to trans-theoretical model of change
- Case study development in groups - examples of patients who were difficult to manage in relationship to their behaviour as physiotherapists, and discussions in relation to readiness to change and our need to fix
- Spirit of MI
- 4 Processes of MI
- Engagement
  - Micro-skills of MI – OARS – discussion and practice
  - Open versus closed questioning
  - Evocative questioning
- Role plays, large and small group work around OARS

Day 2 – 23rd July 2015

- Theoretical underpinning of MI approach
- MI processes (cont):
- Focusing
  - Elicit, provide, elicit
  - Asking permission
  - Identify on target behaviour
  - Agenda mapping
  - Use of techniques to bring conversation back into focus
  - Collaborative – shared decision-making
- Evoking the client
  - Elicit change talk
  - Selective eliciting, selective responding
  - DARN-C
- Planning for change
  - Negotiating change plan
  - SMART goals
- Additional MI tools
  - Typical Day
  - Looking Back/Looking Forward
  - Two Possible Futures
  - The Miracle Question
  - The Tree of Life
  - Scaling Questions
  - Decisional Balance
  - The Blob Tree (Pip Wilson)
- Dealing with resistant / difficult patients
  - Strategies and approaches

Appendix 8: Physiotherapist supervision attendance

PT	3	4	5	7	9	10	11	12	13	16
Aug sep	1	1	1	1	1	1	1		1	1
Sep oct	2	2	2	2	2	2	0	1	2,3	2
Nov	?	?	3	3	3	3	0	2		3
Dec	3	3	4	4	4	4	0	3,4		4
Dec - Jan	4	4	5	5	5			5	4	5
Total	4	4	5	5	5	4	1	5	4	5
26-Aug-15		y	y	y						
01-Sep-15							y			
02-Sep-15					y	y			y	y
09-Sep	y									
11-Sep-15									y	
02-Oct-15								y		
13-Oct-15	y	y	y	y						
14-Oct-15					y	y			y	
22-Oct-15	not in diary as was on leave									y
03-Nov-15		doc appt	y	y						
04-Nov-15					y	y	sick leave	tbc	leave	y
01-Dec-15	y		y							
04-Dec-15					y			y		
08-Dec-15				y						
10-Dec-15										y
18-Dec-15								y		
17-Dec-15	y									
22-Dec-15		y	y	y						
23-Dec					y	y				y
05-Jan		y						y	y	
Interviews	10-Feb	10-Feb	10-Feb	12-Feb	12-Feb	09-Feb	DNF	09-Feb	12-Feb	16-Feb

Appendix 9: Motivational interviewing Group A supervision sessions

Motivational Interviewing Group A Supervision Sessions: Outline and Examples of Handouts

August/ September 2015 to Jan/Feb 2016

Session 1

1. Individual updates – and questions from practice to date ID key challenges to date
2. Summarise challenges and Qs - problem solving
3. Discuss MI Sandwich – overcome anxiety of using closed Qs
4. Practice OARS

Session 2

1. Individual updates – and questions from practice to date ID key challenges to date
2. Coding quiz
3. Moving on – recognising
   - Rolling with resistance
   - Readiness to change – readiness scale
   - DARN-C early on

Session 3

1. Update with progress/ feedback
2. Expand discussion as appropriate, led by areas of challenge
3. Quiz – simple / complex reflection / DARN-C in teams
4. Case study – listen to and feedback on BECCI recording

Session 4

1.Update with progress
2.Evoking and responding to change talk, scaling questions
3.Change planning – info and advice / menu options / ask for commitment

Session 5

1.Update with progress / feedback
2.Case studies – problem solving as group
3.Structured practice – negative practice – incl persuasion and use of roadblocks

Exercises taken from: MINT Motivational Interviewing Training New Trainers Manual

http://www.motivationalinterviewing.org/sites/default/files/tnt_manual_2014_d10_20150205.pdf

Handout – Session 1-2

MI STYLE AND TRAPS

Motivational Interviewing is not a technique but rather a style, a facilitative way of being with people. MI is a client-centred, empathetic and yet directive interaction designed to explore and reduce inherent ambivalence and resistance, and to encourage self-motivation for positive change in people presenting for substance abuse treatment.

COLLABORATION - MI requires that the therapist relate to the client in a non-judgmental, collaborative manner. The patient's experience and personal perspectives provide the context within which change is facilitated rather than coerced.

EVOCATION - The interviewer's tone is not one of imparting wisdom, insight or reality, but rather of **eliciting the patient's internal viewpoint**. The therapist draws out ideas, feelings, and wants from the patient. Drawing out motivation, finding intrinsic motivation for change and bringing it to the surface for discussion is the essence of MI.

AUTONOMY - **Responsibility for change is left totally with the patient**. Individual autonomy is respected. MI style communicates safety and support, first through an absence of confrontation or persuasion and second, by acceptance of the patient.

ROLL WITH RESISTANCE - Opposing resistance generally reinforces it. Resistance, however, can be turned or reframed slightly to create a new momentum toward change. The interviewer does not directly oppose resistance, but rather rolls and flows with it. Reluctance and ambivalence are not opposed but are acknowledged to be natural and understandable. The interviewer does not impose new views or goals, but invites the patient to consider new information and offers new perspectives. Session 1

The interviewer does not feel obliged to answer a patient's objection or resistance. In MI, the interviewer commonly turns a question or problem back to the person, and relies on the patient's personal resources to find solutions to his/ her own issues. Rolling with resistance includes involving the person actively in the process of problem solving. **Resistance is a signal for the interviewer to shift approach.** How the interviewer responds will influence whether resistance increases or diminishes.

TRAPS - MI interviewers have discovered a number of “traps” which prevent full use of MI style in working with substance abuse clients. Here are a few of the most common traps into which therapists can fall.

1. Question-Answer Trap. Setting the expectation that the therapist will ask questions and the patient will then answer, fosters patient passivity. This trap can get sprung inadvertently when you ask many specific questions related to filling out forms early in treatment. Consider having patients fill out questionnaires in advance, or wait until the end of the session to obtain the details you need. Asking open-ended questions, letting the patient, and using reflective listening are several ways to avoid this trap.

2. Labelling Trap. Diagnostic and other labels represent a common obstacle to change. Beware best to avoid “problem” labels, or refocus attention. For example, “Labels are not important. You are important, and I’d like to hear more about…”

3. Premature Focus Trap. When a therapist persists in talking about her own conception of “the problem” and the patient has different concerns, the therapist gets trapped and loses touch with the patient. The patient becomes defensive and engages in a struggle to be understood. To avoid getting trapped start with the patient’s concern, rather than your own assessment of the problem. Later on, the patient’s concern may lead to your original judgment about the situation.

4. Taking Sides Trap. When you detect some information indicating the presence of a problem and begin to tell the patient about how serious it is and what to do about it, you have taken sides. This may elicit oppositional “no problem here” arguments from the patient. As you argue your view, the patient may defend the other side. In this situation you can literally talk the patient out of changing. You will want to avoid taking sides.

5. Blaming Trap. Some patients show defensiveness by blaming others for their situation. Using reflective listening and reframing, you might say, “Who is to blame is not as important as what your concerns are about the situation.”

6. Expert Trap. When you give the impression that you have all the answers, you draw the patient into a passive role. In MI the patient is the expert about his/her situation, values, goals, concerns, and skills. In MI style treatment you seek collaboration and give your patients the opportunity to explore and resolve ambivalence for themselves.

MI REFRESHER

1. **MI MICRO-SKILLS: OARS**
    a. Open-ended questions
    b. Affirmations
    c. Reflective listening
    d. Summaries

2. **EXPLORING AMBIVALENCE**
    a. Decision balance
    b. Developing discrepancy
        i. Exploring goals and values
        ii. Looking forward

3. **THE ROLE OF AND ROLLING WITH RESISTANCE**
    a. What does it look and feel like?
        i. Arguing
        ii. Interrupting
        iii. Negating or “denial”
        iv. Ignoring
    b. What is it?
        i. **A cue to change strategies**
        ii. A normal reaction to having freedoms decreased or denied
        iii. An interpersonal process
    c. Ways to roll
        i. Reflections
        ii. Shift focus
        iii. Reframe
        iv. Agreement with a twist
        v. Emphasize personal choice and control
        vi. Coming alongside

4. **THE CONCEPT OF READINESS: IMPORTANCE + CONFIDENCE**
    a. As related to stages of change

b. Methods of measuring
    i. Readiness ruler
    ii. Instruments like URICA and SOCRATES

5. **CHANGE TALK**
    a. Recognizing DARN C statements
        i. Desire
        ii. Ability
        iii. Reasons
        iv. Needs
        v. Commitment level
    b. Eliciting change talk
        i. Evocative questions
        ii. Elaborations

6. **DEVELOPING A CHANGE PLAN**
    a. Role of information and advice
    b. Menu options
    c. Asking for commitment

STAGES OF MI

1. Engaging the client
2. Focusing the client
3. Evoking the client
4. Planning for change

Also consider: MI SANDWICH

Step 1 - Building a bond with the patient

During the initial minutes of the session the clinician uses MI skills to build rapport and elicit a discussion of the patient's perception of his /her problems. During this initial segment of the interview the clinician gets an idea of where the patient is on the stages of change continuum, what kinds of resistance may emerge, and the patient's readiness for change.

Step 2 - Gathering essential information and/or providing feedback

Step 2 involves conducting assessment / reviewing existing assessment data. Clearly there are aspects here which will be conducted in the 'usual' manner since is typically is a semi-structured method of data collection. When finished, the clinician can summarize the information obtained or go back to specific items to elicit further discussion, using an MI style before proceeding to Step 3.

Step 3- Summarizing and reconnecting with the client

At this point the interview shifts back to a more open-ended format to better understand what the patient wants to achieve during treatment. The clinician utilises strategies for eliciting change or dealing with resistance in this phase. The material obtained during the standard assessment provides clinician with ideas about questions that might be asked to establish discrepancies and enhance motivation for change.

In summary, each of the 3 Steps above can be conceptualised as an MI SANDWICH in which a more structured standard assessment is sandwiched between two client-centred MI interventions. The MI assessment starts with an MI-style discussion of problems (Step 1), shifts to a more formalized assessment or review of existing assessment information (Step 2), and then shifts back to an MI discussion of change (Step 3).

Session 2: **COARS Observer Sheet**

Listen out and mark down (tally) when you hear any of the OARS and make any comments you feel appropriate.		
Closed Questions		
Open Ended/ Evocative Questions		

Affirmations		
Reflections		
Summaries		
Notice any Change Talk Desire Ability Reason Need		

Session 3

Quiz – November 2015
A 36-year-old man tells you: My neighbor really makes me mad. He's always over here bothering us or borrowing things that he never returns. Sometimes he calls us late at night after we've gone to bed, and I really feel like telling him to get lost.

Simple or complex reflection?

1. He makes you pretty mad.
2. He's not very considerate.
3. Sometimes he wakes you up.
4. You wish he would find himself.
5. He's really a pest.
6. You wish he weren't your neighbor.
7. He really bothers you.
8. You hold your temper in.
9. You want to tell him to get lost.
10. You're a fairly passive person.

Open or closed question?

11. Why don't you?
12. Are you going to?
13. How often does he come over?
14. Does he borrow expensive things?
15. Why do you suppose he does these things?
16. Do you feel like hurting him?
17. Have you ever offended him?
18. Can you think of a time when he did return something?
19. How late does he call?
20. What else might you do besides telling him off?

You're listening to a smoker talk about quitting. Is it change talk? If so, which kind might it be: Desire, Ability, Reasons, Need, or Commitment?

1. **I've got to quit smoking.**
2. **I wish I could.**
3. **I'll think it over.**
4. **I'm sure I'd feel a lot better if I did.**
5. **I don't know how I'd relax without a cigarette.**
6. **I swear I'm going to do it this time.**
7. **I want to be around to see my grandkids.**
8. **It really is bad for you, I know.**
9. **More and more of the people I know are trying to quit.**
10. **I'll try.**
11. **It's really important for me to quit.**
12. **I did quit for six weeks once.**
13. **Smoking is just so much a part of my life.**
14. **Maybe I'll get around to it this year.**
15. **It's important, but not the most important thing for me right now.**

Behaviour Change Counselling Index (BECCI)

BECCI is an instrument designed for trainers to score practitioners' use of Behaviour Change Counselling in consultations (either real or simulated). To use BECCI, circle a number on the scale attached to each item to indicate the degree to which the patient/practitioner has carried out the action described.

Before using BECCI, please consult the accompanying manual for a detailed explanation of how to score the items. As a guide while using the instrument, each number on the scale indicates that the action was carried out:

0. Not at all
1. Minimally
2. To some extent
3. A good deal
4. A great extent

The Topic**:** _____

Item	Score
1. Practitioner invites the patient to talk about behaviour change **Not Applicable** ☐	**not at all** 0 1 2 3 4 **a great extent**
2. Practitioner demonstrates sensitivity to talking about other issues	**not at all** 0 1 2 3 4 **a great extent**
3. Practitioner encourages patient to talk about current behaviour or status quo	**not at all** 0 1 2 3 4 **a great extent**
4. Practitioner encourages patient to talk about change	**not at all** 0 1 2 3 4 **a great extent**
5. Practitioner asks questions to elicit how patient thinks and feels about the topic	**not at all** 0 1 2 3 4 **a great extent**
6. Practitioner uses empathic listening statements when the patient talks about the topic	**not at all** 0 1 2 3 4 **a great extent**
7. Practitioner uses summaries to bring together what the patient says about the topic	**not at all** 0 1 2 3 4 **a great extent**
8. Practitioner acknowledges challenges about behaviour change that the patient faces	**not at all** 0 1 2 3 4 **a great extent**
9. When practitioner provides information, it is sensitive to patient concerns and understanding **Not Applicable** ☐	**not at all** 0 1 2 3 4 **a great extent**
10. Practitioner actively conveys respect for patient choice about behaviour change	**not at all** 0 1 2 3 4 **a great extent**
11. Practitioner and patient *exchange* ideas about *how* the patient could change current behaviour *(if applicable)* **Not Applicable** ☐	**not at all** 0 1 2 3 4 **a great extent**

Practitioner BECCI Score: _____

Practitioner speaks for (approximately):-

More than half time ☐ About half the time ☐ Less than half the time ☐

Session 4 Handout

Ten Strategies for Evoking Change Talk

1. Ask Evocative Questions

Ask open questions, the answer to which is change talk.
Examples:
Why would you want to make this change? (Desire)
How might you go about it, in order to succeed? (Ability)
What are the three best reasons for you to do it? (Reasons)
How important is it for you to make this change? (Need)
So what do you think you'll do? (Commitment)

2. Ask for Elaboration

When a change talk theme emerges, ask for more detail. In what ways?

3. Ask for Examples

When a change talk theme emerges, ask for specific examples. When was the last time that happened? Give me an example. What else?

4. **Look Back**

Ask about a time before the current concern emerged. How were things better, different?

5. **Look Forward**

Ask what may happen if things continue as they are (status quo). If you were 100% successful in making the changes you want, what would be different? How would you like your life to be five years from now?

6. **Query Extremes**

What are the worst things that might happen if you don't make this change? What are the best things that might happen if you do make this change?

7. **Use Change Rulers**

Ask, "On a scale from zero to ten, how important is it to you to [target change] - where zero is not at all important, and ten is extremely important?
Follow up: And why are you at_____and not zero? What might happen that could move you from_____to [higher score]?
Instead of "how important" (need), you could also ask how much you want (desire), or how confident you are that you could (ability), or how committed are you to ____ (commitment). Asking "how ready are you?" tends to be a bit confusing because it combines competing components of desire, ability, reasons and need.

8. **Explore Goals and Values**

Ask what the person's guiding values are. What do they want in life? Using a values card sort can be helpful here. If there is a "problem" behavior, ask how that behavior fits in with the person's goals or values. Does it help realise a goal or value, interfere with it, or is it irrelevant?

9. **Come Alongside**

Explicitly side with the negative (status quo) side of ambivalence. Perhaps_____is so important to you that you won't give it up, no matter what the cost.

Appendix 10: Excerpts of notes from supervision sessions

26.08.15

Group session – 3 attendees

Feedback:

PT1 - Keen to try MI as want it to work. Finding patient offloading and doesn't want to interrupt. Tension between listening and getting on with assessment

PT2 – Finding MI useful but concerned not get through information gathering, especially with complex histories

PT3 – Finding reflections and affirmations working well. Again, has some concern about open questions during information gathering

Researcher:

Refreshed MI OARS skills discussion and practice

Led discussion on scene setting

Introduced concept of 'MI sandwich' as a way of being MI adherent while using closed Qs necessary for red flags and other information gathering. To ask permission and provide explanation prior to launching into sets of Qs

Discussed recognising DARN-C more

02.09.15

Group session – 4 attendees

Feedback:

PT 4 – Getting on ok. Key challenge time – asking so many open Qs

PT 5 – was using lots until 2/52 ago. Had v difficult patient who did not react well to MI. Was probably resisting and did not recognise this so kept using the same approach. Felt vulnerable. Had a debrief with physio supervisor. Put off using MI. LH to meet for separate follow-up to discuss

PT 6 – Trying to use – uses on and off. Has to 'choose' patients.

PT 7 – Generally good results. Again does not use all the time. Time for open Qs can be an issue. Finding the planning very useful. Has started using scaling Qs and find this helpful.

Researcher:

Revised OARS

Introduced and discussed 'MI sandwich'

Worked collaboratively with group to problem solve and generate suggestions on how to proceed based on queries to date

Discussed use of scales, and reading of change behaviours
Next time: role play of resistance

03.09.17

Individual session

Feedback:

PT 8 – in and out of MI. Had one patient seemed very happy and felt it worked. Plan discussed with patient more fully. Has queries about how to note down the approach in the patient records for clarity and so understandable by others

Researcher – discussed suggestions for recordings with PT in terms of feasibility with notes and relevance

As in other sessions – revised OARS and introduced MI sandwich.

02.10.15

Group session – 4 attendees

Feedback:

Growing in confidence with trying out MI, but tiring to remember what to say, and needing to think about this while listening to the patient at the same time.

All agreed this was more tiring as having to think so hard.

Researcher, with group:

Reviewed recording of MI. Discussed the role of MI in guiding the patient and use of prompts which could be used as the basis for questions – evoking / scaling to reduce the pressure to always find the words at the time.

Role around case scenarios

01.12.17

Group session - 2 attendees

FeedbackGetting to grips with using MI. Challenging as new system being introduced for electronic note-keeping. Distracting when trying to use new approach. Also, concerned changed interface with the patient since looking at screen, not patient.

Mentioned that they had an IST session on chronic pain with a specialist physiotherapist colleague. Found it really enjoyable and it aligned very well with the MI training which was encouraging.

Researcher – discussed how to minimise impact of patient recording mode.

Practiced evoking strategies and scaling questions etc.

Getting commitment to management plan discussed.

10.12.17

Individual session

Feedback:

Forgets to use MI sometimes. Confident is good at engagement. Lacks confidence that using MI as much as expected: has incorporated MI into practice but does not use all elements.

Researcher:

Reassured that it may be that MI not indicated in all situations. Developed session using case studies. Introduced and role play evoking questions.

Appendix 11: Physiotherapist demographic questionnaire

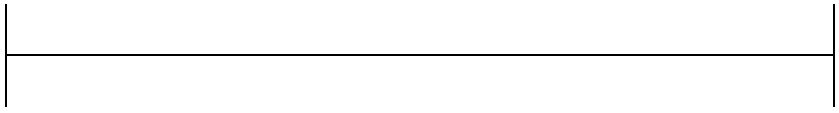
PHYSIOTHERAPIST DEMOGRAPHIC QUESTIONNAIRE

Please complete the following:

<table>
<tr><td>Date of Birth</td><td colspan="2"></td></tr>
<tr><td>Gender</td><td colspan="2">Male / Female (delete as appropriate)</td></tr>
<tr><td>Year of Qualification as a Physiotherapist</td><td colspan="2"></td></tr>
<tr><td>Current job role e.g. Band 7 MSK outpatients</td><td colspan="2"></td></tr>
<tr><td>How long have you been in this current role? (years + months)</td><td colspan="2"></td></tr>
<tr><td>How much time in your career has been spent in a MSK outpatient setting? (years + months)</td><td colspan="2"></td></tr>
<tr><td rowspan="5">Have you received any training in any specific psychological / cognitive / behavioural approaches? e.g. MI, CBT, ACT.</td><td colspan="2">Yes / No (delete as appropriate)

If your answer to this question is ‘yes’ please provide further details below:</td></tr>
<tr><td>Approach</td><td>Length of training (Days)</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table>

Please indicate a point on the line below in order to rate your current proficiency in using an MI approach:



Not at all proficient **Highly proficient**

Appendix 12: The pain attitudes and beliefs scale for physiotherapists (PABS-PT)

The Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) (Houben *et al*, 2005a)

Please indicate your level of disagreement/ agreement with the following statements about chronic low back pain. Please provide a response for **all** statements.

No	Statement	Level of disagreement / agreement (please circle)
1	Mental stress can cause back pain even in the absence of tissue damage	Totally disagree 0 1 2 3 4 5 Totally agree
2	The cause of back pain is unknown	Totally disagree 0 1 2 3 4 5 Totally agree
3	Pain is a nociceptive stimulus, indicating tissue damage	Totally disagree 0 1 2 3 4 5 Totally agree
4	A patient suffering from severe low back pain will benefit from physical exercise	Totally disagree 0 1 2 3 4 5 Totally agree
5	Functional limitations associated with back pain are the result of psychosocial factors	Totally disagree 0 1 2 3 4 5 Totally agree
6	Patients with back pain should preferably practice only pain free movements	Totally disagree 0 1 2 3 4 5 Totally agree
7	Therapy may have been successful even if pain remains	Totally disagree 0 1 2 3 4 5 Totally agree
8	Back pain indicates the presence of organic injury	Totally disagree 0 1 2 3 4 5 Totally agree
9	If back pain increases in severity, I immediately adjust the intensity of my treatment accordingly	Totally disagree 0 1 2 3 4 5 Totally agree
10	If therapy does not result in a reduction in back pain, there is a high risk of severe restrictions in the long term	Totally disagree 0 1 2 3 4 5 Totally agree
11	Pain reduction is a precondition for the restoration of normal functioning	Totally disagree 0 1 2 3 4 5 Totally agree

No	Statement	Level of disagreement / agreement (please circle)
12	Increased pain indicates new tissue damage or the spread of existing damage	Totally disagree 0 1 2 3 4 5 Totally agree
13	There is no effective treatment to eliminate back pain	Totally disagree 0 1 2 3 4 5 Totally agree
14	Even if the pain has worsened, the intensity of the next treatment can be increased	Totally disagree 0 1 2 3 4 5 Totally agree
15	If patients complain of pain during exercise, I worry that damage is being caused	Totally disagree 0 1 2 3 4 5 Totally agree
16	The severity of tissue damage determines the level of pain	Totally disagree 0 1 2 3 4 5 Totally agree
17	Learning to cope with stress promotes recovery from back pain	Totally disagree 0 1 2 3 4 5 Totally agree
18	Exercises that may be back straining should not be avoided during the treatment	Totally disagree 0 1 2 3 4 5 Totally agree
19	In the long run, patients with back pain have a higher risk of developing spinal impairments	Totally disagree 0 1 2 3 4 5 Totally agree

Scores generated from this questionnaire:

- score for the biomedical orientation (PABi) – calculated from the sum of scores for the following ten items: 3, 6, 8, 9, 10, 11, 12, 15, 16 and 19
- score for the behavioural orientation (PABe) – calculated from the sum of scores for the following nine items: 1, 2, 4, 5, 7, 13, 14, 17 and 18

Appendix 13: Health care providers pain and impairment relationship scale (HC-PAIRS)

Health Care Providers Pain and Impairment Relationship Scale (HC-PAIRS) (Rainville et al, 1995)

The following questionnaire attempts to evaluate attitudes and beliefs of health care professionals about **CHRONIC BACK PAIN PATIENTS**. Please rate how you feel about the following statements by putting a circle around the relevant number on the scale below each statement which corresponds to your beliefs about each statement.
Remember, the statements relate to **CHRONIC BACK PAIN PATIENTS.** Please complete all sections.

No	Statement
1	Chronic back pain patients can still be expected to fulfil work and family responsibilities despite pain. 1 Completely Disagree 2 Disagree 3 Disagree Somewhat 4 Neutral 5 Agree Somewhat 6 Agree 7 Completely Agree
2	An increase in pain is an indicator that a chronic back pain patient should stop what he is doing until the pain decreases. 1 Completely Disagree 2 Disagree 3 Disagree Somewhat 4 Neutral 5 Agree Somewhat 6 Agree 7 Completely Agree
3	Chronic back pain patients cannot go about normal life activities when they are in pain. 1 Completely Disagree 2 Disagree 3 Disagree Somewhat 4 Neutral 5 Agree Somewhat 6 Agree 7 Completely Agree
4	If their pain would go away, chronic back pain patients would be every bit as active as they used to be. 1 Completely Disagree 2 Disagree 3 Disagree Somewhat 4 Neutral 5 Agree Somewhat 6 Agree 7 Completely Agree
5	Chronic back pain patients should have the same benefits as the disabled because of their chronic pain problem. 1 Completely Disagree 2 Disagree 3 Disagree Somewhat 4 Neutral 5 Agree Somewhat 6 Agree 7 Completely Agree
6	Chronic back pain patients owe it to themselves and those around them to perform their usual activities even when their pain is bad. 1 Completely Disagree 2 Disagree 3 Disagree Somewhat 4 Neutral 5 Agree Somewhat 6 Agree 7 Completely Agree
7	Most people expect too much of chronic back pain patients, given their pain. 1 Completely Disagree 2 Disagree 3 Disagree Somewhat 4 Neutral 5 Agree Somewhat 6 Agree 7 Completely Agree

No	Statement
8	Chronic back pain patients have to be careful not to do anything that may make their pain worse. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree
9	As long as they are in pain, chronic back pain patients will never be able to live as well as they did. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree
10	When their pain gets worse, chronic back pain patients find it very hard to concentrate on anything. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree
11	Chronic back pain patients have to accept that they are disabled persons, due to their chronic pain. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree
12	There is no way that chronic back pain patients can return to doing the things that they used to do unless they first find a cure for their pain. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree
13	Chronic back pain patients find themselves frequently thinking about their pain and what it has done to their life. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree
14	Even though their pain is always there, chronic back pain patients often don't notice it at all when they are keeping themselves busy. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree
15	All of chronic back pain patients' problems would be solved if their pain would go away. 1 Completely Disagree · 2 Disagree · 3 Disagree Somewhat · 4 Neutral · 5 Agree Somewhat · 6 Agree · 7 Completely Agree

Scores generated from this questionnaire:

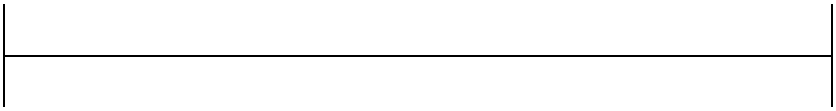
- HC-PAIRS total score (sum of 13 state item rating scores – not including 10 and 13)
- HC-PAIRS dimension 1 score (sum of rating scores for items 1,2,3,6,7,8,9,11,12: functional expectations)
- HC-PAIRS dimension 2 score (sum of rating scores for items 5,7,11,14: social expectations)
- HC-PAIRS dimension 3 score (sum of rating scores for items 4,9,15: need for cure)

Appendix 14: Physiotherapist self-evaluation VAS scales

Name: **Date:**

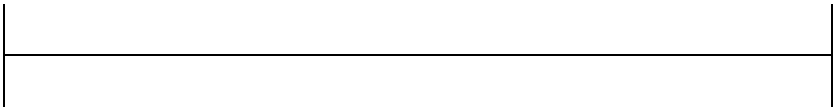
Proficiency, confidence and intention to practice self-evaluation

1. **Please indicate a point on the line below in order to rate your current proficiency in using an MI approach:**



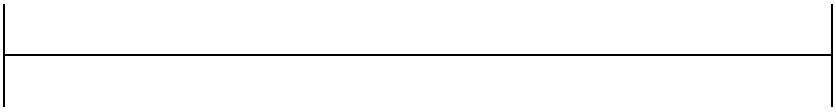
Not at all proficient **Highly proficient**

2. **Please indicate a point on the line below which you feel best represents your current level of confidence in using MI with patients:**



Not at all confident **Extremely confident**

3. **Please indicate a point on the line below which best represents your current intention to use MI with persistent LBP patients in practice:**



No intention **Every intention**

Appendix 15: Patient selection and recording guidance

Using SONY Recorder – Information

To switch on / off

Slide switch to **POWER ON / OFF (HOLD SETTING to protect status)**

To record (first recording will appear as 01/01)

- **REC/PAUSE** button **(red)**

Amber flashing light will turn continuous red above display window

PAUSE as necessary – red light will flash

To stop recording

- **STOP** button

To listen to recording

- **PLAY**

To start new recording

- **REC/PAUSE** button **(red) as above**

This will appear as 02/02

Repeat recordings as necessary (03/03, 04/04 …etc)

To erase recording

Fast forward or rewind through recordings and listen to make sure correct recording noted

Make sure the display shows the recording to be erased

Press **ERASE**

Move to **YES** or **NO** using Fast forward or rewind key

- **PLAY** to confirm

Other information on display

To add an additional folder

 Icon on top left below display screen

Forward or Rewind buttons to move between folders

- **PLAY** to confirm choice

To optimise sound recordings

Press SCENE key

Then move between settings using FF and Rewind keys – set to INTERVIEW

PLEASE:

Make a note of recorder number, date and time of recording

STORE SECURELY AT ALL TIMES

CALL LESLEY HAIG FOR INFORMATION OR TO COLLECT RECORDING ON 07973772643 OR EMAIL haigl2@lsbu.ac.uk

Appendix 16: Draft interview guide for interview with physiotherapists

The effects of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists

DRAFT INTERVIEW GUIDE

This draft interview guide is intended for use by the Chief Investigator when interviewing physiotherapists six months after the MI baseline training has been delivered. The guide may be updated if key areas are identified during the monthly coaching sessions if these appear to be significant in terms of the transition of MI training into practice for physiotherapists.

Start of the interview:

Introductions to put interviewee and interviewer at ease.

Provide an outline of how the interview will be conducted and structure of the interview. Highlight the fact that there are no right or wrong answers and that the aim is to explore their individual experiences.

Interview questions

1. **Training programme**

   How useful was the MI training programme in providing the basis for putting MI into practice?

   Prompts – Why did they decide to take part in the training programme?

   Was the initial training (2 days) long enough? Would a different delivery pattern have worked better for them? Did the pace / depth work? If not how could this be improved? How did they feel about the content? Was the approach in agreement with their belief system? If not – what were the key differences to their usual approach?

   Any other general comments about the training programme?

   How did they find the ongoing coaching sessions? Did these help to develop their skills more than ongoing practice? How? Or if not – would they have liked an alternative mode of support? E.g. online, telephone calls?

2. **Putting training into practice**

   How long did it take them to first use this approach after the training programme?

   Prompts - If not immediate why was that? (e.g. confidence / patient expectation / role / context / beliefs / patient presentation / other).

   Once they started using MI with patients how did they feel? How did the patient respond? Were they able to maintain the delivery as they intended? Did they feel that they had an impact on the patient's behaviour? Did it feel different to their usual communication style? (e.g. more patient-centred, sympathetic, reflective, less challenging).

3. **Challenges / barriers**

What did they find most challenging about in putting MI into practice?
Prompts - Why do they think this was / is? How did they overcome this (if at all)?
What did they find the key barriers were personally to using MI with persistent LBP patients (if any)? What do they think the reasons for these were? How were these overcome (if they were)? (e.g. approach, beliefs, time, inappropriate patient types).
Were there any local factors in the department that made it harder / easier to work with patients in this way? (E.g. targets, time, attitudes / lack of support from others, change in role).

4. **MI approach in practice**
Do they think their use of the MI approach changed over time?
Prompts –
If so how – in what way? Why do they think this was? Did they practice using the approach with patients? What helped them implement the approach? (E.g. confidence, having a strategy available to them, encouragement from others, impact of data collection).
Do they think the MI approach is something they would continue to use with LBP patients? Any other patient groups that they currently use this approach with or they perceive it may benefit?
Has the training changed how they approach / feel about persistent low back pain? Or their beliefs / attitudes to patient approaches to LBP? Did it change the way they deal with patients? If yes how?

5. **Perceived impact of training**
Do they think that undertaking the programme will have any impact on them individually in the medium / long-term?
Prompts – If so – in what way? Any potentially positive impacts? (E.g. career prospects, personal satisfaction with additional skills in 'toolkit). Any negative?
Do they think this type of approach is something that other physiotherapists may find useful? What stage of training / career do they think would be most helpful?

6. **Any other comments?**

Appendix 17: Final interview guide for interview with physiotherapists

INTERVIEW GUIDE – February 2016 **LH MI Research**

Interviewee: **Date:**

Start of the interview:

Provide an outline of how the interview will be conducted and structure of the interview. Highlight the fact that there are no right or wrong answers and that the aim is to explore their individual experiences.

Interview questions

1. Training programme

How useful was the MI training programme in providing the basis for putting MI into practice?
Prompts – Why did they decide to take part in the training programme?
Was the initial training (2 days) long enough? Would a different delivery pattern have worked better for them? Did the pace / depth work? If not how could this be improved? How did they feel about the content? Was the approach in agreement with their belief system? If not – what were the key differences to their usual approach?
Would it have been better to have a gap between the 2 days?

2. Ongoing Coaching

How did they find the ongoing coaching sessions?
Did these help to develop their skills more than ongoing practice? How?
More than ongoing practice alone?
Would they have liked an alternative mode of support? E.g. online, telephone calls?

3. Putting training into practice

How long did it take them to first use this approach after the initial training days?
Prompts –
If not immediate why was that? (e.g. confidence / patient expectation / role / context / beliefs / patient presentation / other).
Once they started using MI with patients how did they feel?
How did the patient respond?
Were they able to maintain the delivery as they intended?
Did they feel that they had an impact on the patient's behaviour?
Did it feel different to their usual communication style? (e.g. more patient-centred, sympathetic, reflective, less challenging).

4. Challenges / barriers

What did they find most challenging about in putting MI into practice?
Prompts –
Why do they think this was / is?
How did they overcome this (if at all)?
What did they find the key barriers were personally to using MI with persistent LBP patients (if any)?
What do they think the reasons for these were? How were these overcome (if they were)? (e.g. approach, beliefs, time, inappropriate patient types).

5. Other non-patient factors affecting implementation

Were there any local factors in the department that made it harder / easier to work with patients in this way? (E.g. targets, time, attitudes / lack of support from others, change in role).
Introduction of computer software for patient records

6. MI approach in practice

Do they think their use of the MI approach changed over time?
Prompts –
If so how – in what way? Why do they think this was?
Did they practice using the approach with patients?
What helped them implement the approach? (E.g. confidence, having a strategy available to them, encouragement from others, impact of data collection).
Do they think the MI approach is something they would continue to use with LBP patients? *Or all patients?*
Any other patient groups that they currently use this approach with or they perceive it may benefit?
Has the training changed how they approach / feel about persistent low back pain? Or their beliefs / attitudes to patient approaches to LBP?
Did it change the way they deal with patients? If yes how?

7. Perceived impact of training

Do they think that undertaking the programme will have any impact on them individually in the medium / long-term?
Prompts – If so – in what way?
Any potentially positive impacts? (E.g. career prospects, personal satisfaction with additional skills in 'toolkit).
Any negative? Do they think this type of approach is something that other physiotherapists may find useful? What stage of training / career do they think would be most helpful?

8. Any other comments?

Appendix 18: Participant information sheet for physiotherapist interviews

PARTICIPANT INFORMATION SHEET
PHYSIOTHERAPIST INTERVIEWS

The effect of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists

You are being invited to take part in interviews as part of the doctoral research you are participating in. Before you decide it is important for you to understand why the interview is taking place and what it will involve. Ask me if there is anything that is not clear or if you would like more information.
Thank you for reading this.

What is the purpose of the study?
The aim of this study is to investigate the effects of a motivational interviewing (MI) training programme on the attitudes, beliefs and behaviour of physiotherapists. This part of the study involves exploring the experiences of physiotherapists in implementing MI into clinical practice.

Why have I been chosen?
You have been chosen because you are a physiotherapist who has been participating in the main study and has undertaken an MI training programme for the past 6 months.

Do I have to take part?
It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. If you do decide to withdraw from the study, you should let the Chief Investigator know and your interview data (including audio-recordings) will be destroyed securely. This is only possible up to the date of submission of the doctoral thesis (around March 2015) since the information and data will contribute to the results included in this work.

What will happen to me if I take part?
If you take part you will be asked to take part in an interview with the Chief Investigator, Lesley Haig.

What do I have to do?
You will be asked to meet with the Chief Investigator at a mutually convenient time and location which is conducive to audio-recordings being made.

You will be asked to talk about your experiences of the training, and your experiences of putting the training into practice. You will be prompted by a number of brief questions. There are no right or wrong answers to these questions as it is your personal experiences which are important. The interview will last up to an hour. The interview will be audio-recorded with your permission using a digital recorder and transcribed.

What are the possible disadvantages and risks of taking part?
There are no known disadvantages and risks of taking part.

What are the possible benefits of taking part?
Following on from your MI training and practice development it would be extremely useful to understand what your experiences were of the training and implementation of this approach. This will help the Chief Investigator to understand more fully the processes involved during the transfer of this training into practice. This may influence the training programme and the application of this approach in this field of study in the future.

Will my taking part in this study be kept confidential?
All information which is collected about you will be kept strictly confidential. All paper based data will be kept in a locked cupboard. The audio-recordings of the interviews will be stored digitally on a password protected computer. The audio-recordings will be transcribed and retained until the research has been written up fully, and retained for a further period to allow for examination and resubmission of the doctoral thesis. Any other data that is personally identifiable will be destroyed securely by the end of December 2016. Anonymised data will be retained and stored confidentially to allow for a period of report production and publication up to 5 years after data collection.

Any information about you which is shared with others (eg. in reports and publications) or is shared with an academic supervisor will have your name and address and any identifying information removed so that you cannot be recognised from it.

What will happen to the results of the research study?
The results of the study will be reported as part of a thesis for a doctoral degree. It is also intended that the results will be published in journals after 2014. If that is the case then you will not be identified personally in any report. If you are interested in finding out the results of the study please contact Lesley Haig after the study has been completed in summer 2015, who will be pleased to provide you with a summary report.

Who is organising and funding the research?
This research is sponsored by London South Bank University.

Who has reviewed the study?
This study has been reviewed and approved by the Proportionate Review Sub-Committee of the National Research Ethics Service London – City and East (REC Reference 14/LO/2274, IRAS Project ID 71363) and the London South Bank University Ethics Committee (UREC 1407)

If you have any questions or require further information about this study please contact:
Chief Investigator: Lesley Haig
Contact details: Telephone – 07973772643 or e-mail: haigl@lsbu.ac.uk

If you have any concerns about the conduct of this student please contact:
Supervisor: Professor Nicola Crichton
Contact details: Telephone - 02078156742 or e-mail: crichtnj@lsbu.ac.uk

If you would like to contact someone not related to the study about this research please contact:
University Research Ethics Committee
Contact details: ethics@lsbu.ac.uk

Appendix 19: Consent form for physiotherapist interviews

PHYSIOTHERAPIST CONSENT FORM

The effect of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists

- I have read the attached information sheet and have been given a copy to keep. I have had the opportunity to discuss the details and ask questions about this information.
- The Investigator has explained the nature and purpose of the interview and I believe that I understand what is being proposed.
- I understand that my personal involvement and my particular data from this interview will remain strictly confidential.
- I have been informed about what the data collected in this interview will be used for, to whom it may be disclosed, and how long it will be retained.
- I have been informed that the interview will be audio recorded using a digital recorder and transcribed.
- I understand that I am free to withdraw from the study at any time, without giving a reason for withdrawing.
- I hereby fully and freely consent to participate in the interview.

Participant's Name:(Block Capitals) …….

Participant's Signature: …….

Date: …….

As the Investigator responsible for this investigation I confirm that I have explained to the participant named above the nature and purpose of the interview to be undertaken.

Investigator's Name: …….

Investigator's Signature: …….

Date: …….

If you have any questions or require further information about this study please contact:
Chief Investigator: Lesley Haig, on 07973772643 or e-mail: lesley.haig@smuc.ac.uk

If you have any concerns about the conduct of this student please contact:
Supervisor: Professor Nicola Crichton, on 02078156742 or e-mail: crichtnj@lsbu.ac.uk

If you would like to contact someone not related to the study about this research please contact:
London South Bank University Research Ethics Committee at: ethics@lsbu.ac.uk

Appendix 20: MITI Scoring sheet and behaviour counts

Motivational Interviewing Treatment Integrity Code (MITI) Coding Sheet
Revised June, 2007

Tape #_____ **Coder:**_____ **Date:**_____

Global Ratings

Evocation		1 2 3 4 5 Low High
Collaboration		1 2 3 4 5 Low High
Autonomy/ Support		1 2 3 4 5 Low High
Direction		1 2 3 4 5 Low High
Empathy		1 2 3 4 5 Low High

Behavior Counts

Giving Information			
MI Adherent	**Asking permission, affirm, emphasize control, support.**		
MI Non-adherent	**Advise, confront, direct.**		
Question (subclassify)	**Closed Question**		
	Open Question		
Reflect (subclassify)	**Simple**		
	Complex		
	TOTAL REFLECTIONS:		

First sentence:_____

Last sentence:_____

List of MITI Codes

EVOCATION	(Global rating of evocation)
COLLABORATION	(Global rating of collaboration)
AUTONOMY/SUPPORT	(Global rating of Autonomy/Support)
DIRECTION	(Global rating of direction)
EMPATHY	(Global rating of empathy)
SPIRIT	(Global rating of MI Spirit; Average of Evocation, Collaboration, Autonomy/Support)
GI	(Giving Information)
MiA	(MI Adherent)
MiNa	(MI Non-adherent)
OQ	(Open Question)
CQ	(Closed Question)
Rs	(Reflection simple)
Rc	(Reflection complex)

Appendix 21: Extract from datasheet of PT3 (first participant to be coded)

PT3	Data point	Line	Meaning Unit	Condensed Meaning Unit	Code	Code no
PT3	1	16	I think what becomes more clear is more the worries	Memory of the initial course were the concerns you felt	Remember feeling worried	1
PT3	2	17	you often take the worries away rather than the tools itself and can end up focusing on those	Can take worries away more than skills	Focus on worries	2
PT3	3	18	the worry soon kind of diminished in the sense of the support that you have and we had within	worry soon diminished due to support from outside and within	Support reduces worry	3
PT3	4	18	I think that sort of framework worked because we had that group we were and because of the support that we had.	framework worked due to the nature of the group and level of support	Group support helped	4
PT3	5	21	think I don't think you can make more of a framework from 2 days like that	you can't grasp more than a framework in 2 days	Baseline is enough for 2 days	5
PT3	6	22	you need that clinical application to do it and to try it sound it out	you need to apply it clinically to develop further	Practice needed clinically to develop skill	6
PT3	7	26	The worries are always going to be there when you apply something completely new and a completely different approach	worries when you try to apply a new and completely different approach	Worried about applying new approach	7

Appendix 22: Letter of ethics approval from University Research Ethics Committee

London South Bank University

Direct Line: 020-7815 6025
E-mail: mitchen5@lsbu.ac.uk
Ref: UREC 1407

Lesley Haig
[redacted]

Wednesday 14 May 2014

Dear Lesley

RE: The effects of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists.

Thank you for submitting this proposal and for your responses to the reviewers' comments.

I am pleased to inform you that Full chair's Approval has been given by Chair on behalf of the University Research Ethics Committee.

I wish you every success with your research.

Yours sincerely

[redacted]

[redacted]

Secretary, LSBU Research Ethics Committee

Cc:

[redacted], Chair, LSBU Research Ethics Committee

Appendix 23: Letter of ethics approval from NHS Research Ethics Committee

Revised 05 May 2015

Health Research Authority

NRES Committee London - City & East
Bristol Research Ethics Committee Centre
Whitefriars
Level 3, Block B
Lewins Mead
Bristol
BS1 2NT

Telephone: 01173421386
Fax: 01173420445

19 December 2014

Professor Lesley Haig
[redacted]

Dear Professor Haig

Study title:	**The effects of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists**
REC reference:	**14/LO/2274**
Protocol number:	**UREC 1407**
IRAS project ID:	**71363**

The Proportionate Review Sub-committee of the NRES Committee London - City & East reviewed the above application on 15 December 2014.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact the REC Manager [redacted], nrescommittee.london-cityandeast@nhs.net.

Ethical opinion

On behalf of the Committee, the sub-committee gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

1. *Please include a clear statement on the PIS that the sessions will be held in the physiotherapists own time.*

2. *Please indicate on PIS how much time a participant physiotherapist would need to commit to this study.*

3. *Please add a contact name on the Participant Patient PIS.*

You should notify the REC in writing once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. The REC will acknowledge receipt and provide a final list of the approved documentation for the study, which can be made available to host organisations to facilitate their permission for the study. Failure to provide the final versions to the REC may cause delay in obtaining permissions.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations.

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to contest the need for registration they should contact Catherine Blewett (catherineblewett@nhs.net), the HRA does not, however, expect exceptions to be made. Guidance on where to register is provided within IRAS.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion").

Summary of discussion at the meeting

Informed consent process and the adequacy and completeness of participant information

The Committee noted that the commitment by physiotherapists with regard to time is for initial sessions of about 15-16 hours followed up by further monthly sessions. There is no clear statement on the PIS that these sessions will be held in the physiotherapists own time – only that the sessions are at no cost. The Committee requested this to be clarified in the PIS. You replied that you have negotiated with the managers that the training would be supported by the department so that the training and follow-up would over 2 days. One of these days will be in the physiotherapists' own time. You agreed to clarify the same on the PIS.

The Committee suggested that it would be helpful on the PIS to indicate how much time a participant physiotherapist would need to commit to this study. You agreed to update the PIS to provide an overall statement of time commitment.

The Committee noted that there is no contact name on the Participant Patient PIS – only the University. You agreed to add the same.

Suitability of the applicant and supporting staff

The Committee noted that there is no information in the submission on who will provide the Motivational Training and what qualifications these individuals would have. You clarified that the MI trainer you are intending to use is an individual called [redacted]. She is qualified as a midwife originally, has a BSc in Public Health and is a qualified Integrative Therapist and experienced MI Trainer. She is [redacted]. She is also [redacted] and is an active member of the Motivational Interviewing Network of Trainers (MINT). She is known to you via projects she has delivered via the Centre for Workplace and Community Health at St Mary's [redacted] involving training pharmacists in MI. She regularly runs training courses for physiotherapists and other healthcare professionals in MI.

Other general comments

The Committee noted that there is no statement on who will be funding the MI sessions. The Committee requested if this could this be provided and will any of the data be being passed on to this organisation. You clarified that you will be funding the training personally as part of your doctoral programme, and sub-contracting [redacted] to do this via [redacted]. You further clarified that this has been known to you since the start of the programme and you have funds available to support this. The data will be held by you as the researcher and not passed to any other agency.

The Committee queried if the University would require data to be kept for longer than 6months – 1 year. You clarified that the data sets would be kept for 5 years (A-44). The proposal is that the audio-recordings are kept until the doctoral thesis has been examined to - this is the 'personal data' referred to in A-43.

Approved documents

The documents reviewed and approved were:

Document	*Version*	*Date*
Interview schedules or topic guides for participants [Draft Interview Guide]	1	31 October 2014
IRAS Checklist XML [Checklist_05122014]		05 December 2014
Letter from sponsor [Lesley Haig Sponsor and Indemnity Letter]	1	31 October 2014
Letters of invitation to participant [Letters of request to physiotherapy managers]	1	13 January 2014
Non-validated questionnaire [Physiotherapist Demographic Questionnaire]	1	31 October 2014
Non-validated questionnaire [Physiotherapist Self-evaluation VAS Scales]	1	31 October 2014
Other [Motivational Interviewing Treatment Integrity (MITI) Manual]	3.1.1	31 October 2014
Other [Behaviour Change Counselling Index Form]	1	31 October 2014
Other [Supervisor CV Lynn Summerfield-Mann]	1	31 October 2014
Other [LSBU REC Approval]	1	14 May 2014
Participant consent form [Physiotherapist Consent Form Main Study]	3	31 October 2014
Participant consent form [Physiotherapist Consent Form Interview and Audio-recording]	3	31 October 2014
Participant information sheet (PIS) [Physiotherapist PIS Main Study]	3	31 October 2014
Participant information sheet (PIS) [Patient PIS audio-recordings]	1	31 October 2014
Participant information sheet (PIS) [Physiotherapist PIS Interviews]	3	31 October 2014
REC Application Form [REC_Form_05122014]		05 December 2014
Research protocol or project proposal [Project Proposal]	1	31 October 2014
Summary CV for Chief Investigator (CI) [Lesley Haig CV]	1	31 October 2014
Summary CV for supervisor (student research) [Supervisor CV Nicola J Crichton]	1	31 October 2014
Validated questionnaire [HC Pairs Questionnaire]	1	31 October 2014
Validated questionnaire [PABS-PT]	1	31 October 2014

Membership of the Proportionate Review Sub-Committee

The members of the Sub-Committee who took part in the review are listed on the attached sheet.

There were no declarations of interest.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website:
http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/

HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

With the Committee's best wishes for the success of this project.

14/LO/2274	**Please quote this number on all correspondence**

Yours sincerely

[redacted]

pp [redacted]
Chair

Email: nrescommittee.london-cityandeast@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

"After ethical review – guidance for researchers"

Copy to: [redacted]

NRES Committee London - City & East

Attendance at PRS Sub-Committee of the REC meeting on 15 December 2014

Committee Members:

Name	*Profession*	*Present*	*Notes*
[redacted]	Centre Administrator, Advanced Cardiovascular Imaging	Yes	
[redacted]		Yes	
[redacted]	Barrister	Yes	
[redacted]	Pharmacist	Yes	

Also in attendance:

Name	*Position (or reason for attending)*
[redacted]	Committee Coordinator

Appendix 24: Letter of Research Governance approval

NHS
National Institute for Health Research

[redacted]

[redacted]

Tel: [redacted]
Email: [redacted]
Web: [redacted]

Professor Lesley Haig
[redacted]

Date: 12 May 2015

Dear Professor Haig

Chief investigator: Professor Lesley Haig
PI: Professor Lesley Haig
Study title: The effects of a motivational interviewing training programme for low back pain on the behaviour, attitudes and beliefs of physiotherapists
Provider Organisation: [redacted]
R&D Reference: NIRAS010
REC reference: 14/LO/2274
Unversity Ethics reference: UREC 1407

Thank you for providing us with the documentation relating to your research project. The [redacted] is the lead Research Management & Governance office for [redacted]

NHS Research Governance Assurance for the above research has been granted on the basis described in the application form and supporting documentation on behalf of [redacted], subject to the conditions listed below and overleaf. Permission is granted on the understanding that the study is conducted in accordance with the Research Governance Framework and NHS Trust policies and procedures. Permission is only granted for the activities for which a favourable opinion has been given by the REC.

All amendments (including changes to the local research team) need to be submitted in accordance with guidance in IRAS. Please also inform us of changes to the status of the project.

If you require any further information, do not hesitate to contact [redacted].

[redacted]

Tel: [redacted]
Email: [redacted]
Web: [redacted]

Document	Version	Date
Participant information sheet (PIS) [Patient- Audio Recording]	2	06 January 2015
Participant information sheet (PIS) [Physiotherapist- Interviews]	4	06 January 2015
Participant information sheet (PIS) [Physiotherapist- Main]	4	06 January 2015
Interview schedules or topic guides for participants [Draft Interview guide]	1	31 October 2014
Letters of invitation to participant [Letters of request to physiotherapy managers]	1	13 January 2015
Non-validated questionnaire [Physiotherapist Demographic Questionnaire]	1	31 October 2014
Non-validated questionnaire [Physiotherapist Self-evaluation VAS scales]	1	31 October 2014
Participant consent form [Physiotherapist Consent Form Main Study]	3	31 October 2014
Participant consent form [Physiotherapist Consent Form Interview and Audio Recording]	3	31 October 2014
Participant information sheet (PIS) [Patient- Audio Recording]	2	06 January 2015
Participant information sheet (PIS) [Physiotherapist- Interviews]	4	06 January 2015

NHS
National Institute for Health Research

[redacted]

[redacted]

Tel: [redacted]
Email: [redacted]
Web: [redacted]

Participant information sheet (PIS) [Physiotherapist-Main]	4	06 January 2015
Research protocol or project proposal [Project Proposal]	1	31 October 2014
Validated questionnaire [HC Pairs Questionnaire]	1	31 October 2014
Validated questionnaire [PABS-PT]	1	31 October 2014

Yours sincerely,

[redacted]

Industry & RM&G Operations Manager

c.c. [redacted]

The above study is given NHS Permission- PIC subject to the following conditions:

- There will be no call upon the [redacted] resources other than any mentioned in the application and agreed with the [redacted].
- The research sponsor or the CI or the local PI at the research site may take appropriate urgent safety measures in order to protect research participants against any immediate hazard to their health or safety. The Research Office should be notified that such measures have been taken. The notification should also include the reasons why the measures were taken and the plan for further action. The R&D office should be notified within the same time frame as the REC and any other regulatory bodies.

NHS
National Institute for Health Research

[redacted]

[redacted]

Tel: [redacted]
Email: [redacted]
Web: [redacted]

- The Sponsor organisation must have in place procedures for detecting and dealing with misconduct and fraud. All researchers must be aware of these procedures and any instances must be reported to the R&D Team

- Unless you request otherwise, we will include details of this project on the Primary Care database.

- We will ask the Study Team to send us a copy of the final report and/or a summary of your findings.

- Only members of the clinical care team can access patient identifiable information without the patient's consent. Researchers are not part of the clinical care team and therefore require a patient's consent for access to their confidential data.

- You must comply with the site/s current information governance (IG) requirements.

- All recruitment of UKCRN Portfolio studies must be uploaded to the NIHR Portfolio by the study team.

Please note that your honourary contract with [redacted] ends on 30th September 2015, please ensure this is renewed if required

Appendix 25: Excerpts from Reflexive Log

Excerpts of notes from Reflexive Log

23.07.15 (Day 2 of MI Training Course for Group A Participants)

Participants appear to have grasped the spirit of MI but have significant concerns about putting training into practice. I am not sure I have given adequate consideration to the nature and importance of the role I may need to play in supervision sessions. Will need to read around and find a range of exercises to prompt and develop skills. Want to try the best way to guide the participants and promote their skills without being too directive – to model MI spirit in promoting autonomy and empowering the PTs.

They seem committed to the approach (despite perceived difficulties) and I have made it clear they will be supported during the sessions. Still feel that 1 or 2 participants feel that this seems out of their scope and more like counselling than physio. Despite my enthusiasm and interest in the potential usefulness of this approach for physios, I am realising that MI approach may not suit all and need to remain open to this outcome. Something to explore in future sessions around challenges and alignment with style.

26.08.15 (Following Supervision Session with a Group)

Participants keen to let me know that they have been trying. Strategies appear to be different – some focusing on OARS and others on relationship with patient – realising patient may need to offload and wary now of cutting them off. Overall I feel encouraged that they are trying hard but they are still concerned about how to fit MI in with information gathering.

I had pre-empted this ongoing concern and found an approach called an MI sandwich which I went through with the group. They seemed to be happy and relieved to have a strategy which may help them but allow them to be congruent with MI – giving them permission to use the closed Qs necessary for red flags and other information gathering

I felt pleased that we seemed to have come together to find a solution that may help them. Although I felt a little concerned that a had directed the session too much – rather than evoking solutions from them, I could see that having some potential solutions to hand would allow me to assist and tweak the supervision sessions as needed. I am aware that my knowledge of MSK assessment helped me to identify with them an area of potential difficulty and move the learning along. This was an important point of learning for me also.

02.09.15 (Following Supervision Session with a Group)

Found this a difficult session. Although most of the group have been progressing well (using MI sandwich strategy), one of the group who had been v keen to learn MI had a bad experience with a patient who got angry during the session with her – aggravated she thought partly by ongoing use of MI during the session. She found this really distressing and had put her off using MI.

I felt responsible for this to an extent – that I have underestimated what can go wrong when MI techniques are used on patients who do not welcome this – and had failed to flag up to the group how to cope with this extreme situation should they encounter it. It felt challenging to acknowledge the limitations of MI within the group and felt this lowered group morale. I was concerned that the group may back off trying to use MI as a result. This isn't a situation I have experienced personally in practice. I offered to meet the participant and debrief / she had arranged to do the same with her MSK practice supervisor in her workplace (also MI participant).

The group was supportive of the participant, all agreed this situation would be rare and that the patient sounded very aggressive. The group explored how they would manage a similar situation and we agreed to spend some time in the next session going through how to work with patients who demonstrate resistance. Need to go through this with other participants to ensure they have coping strategies.

04.11.15 (Following supervision session with a Group)

Participant skills seem to be developing – using MI intermittently. Group interested to go through BECCI recording findings (generated by 2 of them) and discuss, highlighting points of success and potential for development in a group.

Am feeling comfortable and confident working with participants to develop skills and offer feedback for development. This has already become a learning journey for me as researcher troubleshooting and pre-empting learning materials and discussions which may take place during sessions. Have identified a range of materials which I have at hand and use as needed around planned sessions. Participants increasingly leading the sessions with questions and case study examples. Very pleased to report positive outcomes which seem v encouraging for them. May have been useful to get them to complete more BECCI recordings and /or keep a learning diary – although aware of the burden of participation to start with.

01.12.17 (Following supervision with two attendees)

Aware of the IST session held recently on chronic pain management which aligned with this research – and seems encouraging for participants. Made me question whether I had sufficient information about local activities which may influence participant experience, and the need to check this regularly during supervision sessions.

Participants using skills – needing prompts and use handout provided to remember language around evoking change - which they keep near their PC. This made me consider more fully the importance of language at an individual level. I have been using different language and approaches for so long I had forgotten how challenging this can be on an individual level.

I chose not to use a new templated assessment form for the research to avoid being prescriptive. I am now increasingly aware of the level of difficulty associated with changing previous approaches in terms of language and how challenging this can be for physios. They seem to be finding certain phrases they use regularly. Noted that this is worthy of ongoing practice and role play in future sessions to reinforce skills.

Appendix 26: Raw data of physiotherapist demographics and baseline VAS results

Physio	Group	Ageyr	Gender	Yearsqual	Currentrole	Timeroleyr	TimeMSKdec	ProfVAS1a	ConfVAS1a	IntentVAS1a
1	B	44.7	F	15	7	10.0	13.3	51.0	38.0	79.0
2	B	40.9	F	19	6	12.1	13.6	17.0	17.0	50.0
3	A	48.7	F	24	7	8.3	18.0	3.0	9.0	76.0
4	A	41.0	F	18	6	10.8	10.8	0.0	0.0	100.0
5	A	25.8	F	4	6	1.0	1.3	0.0	0.0	90.0
6	B	33.0	F	7	7	0.4	5.0	6.7	8.6	100.0
7	A	30.7	F	6	6	1.3	2.8	0.0	0.0	50.0
8	B	37.1	F	10	6	5.0	5.0	0.0	0.0	100.0
9	A	23.5	M	2	6	0.1	1.0	0.0	0.0	47.0
10	A	26.4	M	5	6	1.7	3.0	0.0	0.0	53.0
12	A	31.7	F	10	8	1.4	7.7	3.8	3.8	29.0
13	A	42.3	F	6	6	1.0	3.0	0.0	0.0	22.0
14	B	36.9	F	16	6	7.8	9.0	2.9	2.9	41.0
15	B	53.8	F	33	6	20.0	25.0	50.0	50.0	89.0
16	A	31.4	F	10	6	6.0	7.5	21.0	23.0	84.0