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Motivational strategies in physiotherapy to increase adherence & optimise health behaviour change



A thesis submitted for the degree of Doctor of Philosophy at the University
of Dublin, Trinity College

Submitted February 2015

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Summary

The primary focus of this research was to explore motivational strategies in physiotherapy to improve adherence and elicit health behaviour change. Research has indicated poor adherence to physiotherapy prescriptions and physical activity guidelines. Incontestable epidemiological evidence highlights the fact that healthcare in the 21st Century will be dominated by an escalation in chronic lifestyle-related conditions and healthcare is evolving to reflect this. Healthcare in Ireland, and elsewhere, is changing from a system focused on the treatment of illnesses to one focused on illness prevention and wellbeing. Physiotherapists are well placed to influence health behaviours and can play a leading role in this evolution of healthcare. Research is however required to explore the current situation among members of the physiotherapy profession with regards to improving adherence and eliciting health behaviour change.

This research commenced with a review of the literature exploring the effectiveness of adding motivational interventions to traditional physiotherapy in terms of increasing short and long-term adherence to physiotherapy and eliciting health behaviour change. The key findings demonstrate that motivational interventions can help increase adherence to exercise, have a positive effect on long-term physical activity behaviour, improve self-efficacy and reduce levels of activity limitation. Four theories, cognitive behavioural therapy, motivational interviewing, self-determination theory and social cognitive theory, emerged from the review and were explored further. Similarities between these four theories were identified which physiotherapists could utilise in practice to improve adherence and elicit health behaviour change. There was however, a need to determine how physiotherapists currently practice and to what extent physiotherapists, from all areas of practice, incorporate evidence-based motivational interventions into their practice. There is also a need to determine the levels of physiotherapists' knowledge in this area.

Stemming from the results of the literature review and the exploration of four psychological theories, the first study of this PhD was conducted. A mixed methods

study was chosen to investigate current levels of knowledge and current practice used to improve adherence and elicit health behaviour change. This study comprised of focus groups and a cross-sectional survey. Results indicated physiotherapists recognise that this is an important area for the profession. Evidence-based methods of optimising adherence to physiotherapy and eliciting health behaviour are in use to some extent but are not the most commonly utilised methods, demonstrating a deficiency in current practice. Coercive methods, which have been shown to be ineffective and counterproductive, were also shown to be in use. This study showed that there is a need for education and up-skilling throughout the profession.

The second and third studies of this PhD, therefore investigated education on motivational interventions and focused on motivational interviewing. Study II investigated current continuous professional development for practising physiotherapists and identified barriers and facilitators to the implementation of motivational interviewing into practice. Study III investigated student physiotherapists' knowledge of and confidence in optimising adherence and eliciting health behaviour change after completing an introductory motivational interviewing course. The results of both studies indicate that physiotherapists and physiotherapy students can successfully incorporate motivational strategies into practice. Barriers and facilitators were identified in both studies that provide guidance for action to change physiotherapy practice behaviour.

In conclusion this research indicates that a paradigm shift is required in how physiotherapists communicate with and motivate patients. The importance of health behaviour change is increasing and physiotherapists must develop the knowledge and skills to assist patients with health behaviour change. This would enable the physiotherapy profession to practise in a true patient-centred manner, eliciting behaviour change and improving adherence. This change will have implications throughout the profession, from the individual level to the global level.

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Dissemination of research

Published papers (Appendix 1)

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McGrane, N., Cusack, T. & Stokes, E. Changing how we talk with patients: an investigation of the implementation of Motivational Interviewing into practice by physiotherapists. *Health and Social Care Professions Research Conference*, Dublin 2015

List of abbreviations

CBT	Cognitive behavioural therapy
CC	Cillin Condon
CLBP	Chronic low back pain
CPD	Continuous professional development
CSP	Chartered Society of Physiotherapy
DC	Deirdre Connolly
DM	David Mockler
FEM	Fixed-effects model
ES	Emma Stokes
EMG	Emer McGowan
GL	Grace Lavelle
GP	General Practitioner
HCP	Healthcare professional
HBC	Health behaviour change
HSE	Health Service Executive
ISCP	Irish Society of Chartered Physiotherapists
JG	Jenny Gannon
JOS	James O'Shea
MDT	Multi-disciplinary team
MET	Motivation enhancement therapy
MI	Motivational interviewing
MINT	Motivational Interviewing Network of Trainers
MISC	Motivational interviewing skills code

MITI	Motivational interviewing treatment integrity scale
NMG	Niall McGrane
PEDro	Physiotherapy Evidence Database
PICO	Population Intervention Compare Outcome
RCT	Randomised controlled trial
REM	Random-effects model
RG	Rose Galvin
RP	Relapse prevention
SMD	Standard mean difference
SCT	Social cognitive therapy
SDT	Self-determination theory
SLT	Social learning theory
TC	Tara Cusack
TTM	Trans-theoretical model
UK	United Kingdom
USA	United States of America
WCPT	World Confederation for Physical Therapy

Chapter 1. Introduction

1.1 Introduction

Health and healthcare are changing. In the 20th century healthcare was dominated by prevention, cure and management of acute illnesses whereas healthcare in the 21st century is being dominated by the prevention, cure and management of lifestyle-related conditions (Dean, 2009a). Lifestyle-related conditions include, but are not limited to, ischemic heart disease, cancer, smoking, drug and alcohol related conditions, pulmonary conditions, hypertension, stroke, obesity, poor musculoskeletal health, metabolic syndrome and diabetes. Advancements in healthcare and the resulting increase in life expectancy mean that prevalence of disability and morbidity are increasing. Healthcare delivery is changing to reflect this. It no longer makes sense to only treat people once they are sick. There is, rather, a need to reduce the incidence of lifestyle-related conditions by promoting healthy lifestyle behaviours.

In practice, physiotherapists are faced with an increasing prevalence of unhealthy behaviours and lifestyle-related conditions amongst their patients, including a lack of physical activity. They are also faced with and must deal with non-adherence to physiotherapy prescriptions and non-attendance at physiotherapy sessions. Physiotherapists are very well placed to evolve their practice, to empower health behaviour change (HBC) and to promote health. This will position the profession to influence and lead in the delivery of optimal health services. Dr. Karen Middleton, the chief executive of the Chartered Society of Physiotherapy in the United Kingdom (UK) called for action in her Founder's Lecture in 2014, stating that there could not be a better time for physiotherapists. She stated that now is a time of real growth for the profession and that physiotherapists can play a key part in ensuring that healthcare moves to become more preventive and holistic (Middleton, 2014).

This chapter aims to provide an introduction to the current research by discussing a changing healthcare environment, HBC and adherence, and the role of the

physiotherapist. The aims and objectives of this research will be presented and a summary of the chapters in this thesis will be provided.

1.2 Twenty-first century healthcare

Incontestable epidemiological trends show that for the foreseeable future mortality and morbidity will be dominated by the escalation in chronic lifestyle-related conditions (Dean, 2009a). Chronic or non-communicable diseases were responsible for 38 million (68%) of the world's 56 million deaths in 2012 with more than 16 million (40%) of them occurring in people aged 70 years or younger (World Health Organisation, 2014). Figures in Ireland report a similar scenario where chronic diseases are associated with 86% of mortality and 77% of the overall disease burden (Department of Health, 2012). Among unhealthy lifestyle behaviours, physical inactivity has been recognised as one of the biggest health problems of this century (Blair, 2009). This trend has been attributed in part to advancements in technology and transport, to a decrease in labour intensive jobs and to an increase in sedentary activities, such as lengthy periods spent sitting during commutes to work, at computers and watching television. Epidemiologic transition, which describes changing population patterns in relation to changing patterns of mortality, fertility, life expectancy and leading causes of death, has informed the call for a change in healthcare (McKeown, 2009).

Policy makers, government bodies and health services are becoming more aware of this transition in the healthcare environment. The Health Service Executive (HSE) in Ireland published a report in 2008 calling for a shift of focus in healthcare. This report called for the healthcare service in Ireland to change from a national sickness service, which treats disease, to a national health service that focuses on promoting health, preventing ill-health and providing the best quality care (Health Service Executive, 2008). This report was followed in 2012 with the publication, by the Irish Department of Health, of a framework titled 'Future Health'. This framework set out four pillars of action required to reform Irish healthcare; 1) health and wellbeing, 2) service reform, 3) structural reform and 4) financial reform (Department of Health, 2012). Health and Wellbeing called for a shift in concentration from treating ill people to concentrating on

keeping people healthy. The service reform called for a move away from a hospital-centric model with episodic reactive care, towards preventive, planned and co-ordinated care. A national plan for action to improve health and wellbeing for all parts of society, entitled 'Healthy Ireland', was published in 2013 (Department of Health, 2013). A Healthy Ireland Council was formed and held their first meeting in June of 2014. This council is made up of 37 members with representation from media, sports, patient groups, citizens of various demographics and healthcare professionals, although there is no physiotherapy representation. The Health and Wellbeing division of the HSE was established in June 2013 building on policy changes from 'Future Health' and 'Healthy Ireland'. This division is made up of services that support people and communities to protect and improve their health and wellbeing by turning research, evidence and knowledge into action. Responsibilities also include acting as the authority on health, wellbeing and policy development by building an intelligent health system to promote a healthier population. The reform of Irish healthcare is not unique with healthcare bodies in other developed countries such as the UK, where similar reports and frameworks have been published. A 2004 UK government commissioned report outlined the need to optimise primary and preventive services (Wanless, 2004). This shift of emphasis from government bodies from episodic individual care to health promotion places an emphasis on health behaviours in the delivery of healthcare and poses a challenge to the physiotherapy profession.

1.2.1 Health behaviour change and adherence

There are numerous modifiable unhealthy behaviours that contribute to ill-health and are important risk factors for many chronic health conditions. Physiotherapists in current practice should be aware of and be competent in addressing, or referring to appropriate services, smoking cessation, basic nutritional recommendations, weight control, regular physical activity and exercise prescription, stress and sleep management and recommendations for moderate rather than excessive alcohol consumption (Dean, 2009a). The negative effects of these behaviours on health and the positive effects in changing them are well researched and well known (Dean, 2009a, Dean, 2009b). Increasing physical activity, exercise prescription and maintenance of rehabilitation

regimes are essential interventions used by physiotherapists. Adherence to these interventions is an important part of the rehabilitation process and adherence to prescriptions is necessary for a positive outcome. Despite this importance and the well-established evidence to support the benefits of physical activity (Garber et al., 2011), there is clear evidence indicating a high level of inactivity and non-adherence exist (Hallal et al., 2012, Bassett, 2003). Research suggests that 31% of the world's population do not meet recommended levels of activity (Hallal et al., 2012). A report published by the UK's National Health Service in 2011 states that the majority of adults are aware of physical activity guidelines but that few know what they entail (Roberts and Marvin, 2011). Of a random sample of adults in the United States of America (USA) only 33% correctly identified the American College of Sports Medicine guidelines for physical activity (Bennett et al., 2009). Evidence suggests that 65% of individuals are likely to be non-adherent to home exercise prescriptions and 10% fail to complete their prescribed course of physiotherapy (Bassett, 2003). There is a clear need to address these figures. Existing guidelines published in the UK, the USA and in the European Union recommend the implementation of evidence-based approaches to bring about HBC. These guidelines however do acknowledge inconsistencies and gaps in the evidence regarding successful achievement of HBC (NICE, 2007, Artinian et al., 2010, Perk et al., 2012).

1.2.2 The role of the physiotherapist

The World Confederation for Physical Therapy (WCPT) and national physiotherapy associations in Canada, the USA and Australia advocate the promotion of health and disease prevention as part of a physiotherapist's scope of practice (World Confederation for Physical Therapy, 2011b, Canadian Physiotherapy Association, 2006, Australian Physiotherapy Association, 2008, American Physical Therapy Association, 2001). The WCPT state that physiotherapists are experts in movement and exercise with a thorough knowledge of risk factors and pathology (World Confederation for Physical Therapy, 2011a). The WCPT argue that physiotherapists are the ideal professionals to promote, guide, prescribe and manage exercise activities and efforts (World Confederation for Physical Therapy, 2011a). The shift in healthcare from episodic individual care to promotion of health, coupled with physiotherapists' role as health promoters,

preventers and rehabilitators, positions the profession to influence health behaviours. This position of influence is advanced by the fact that physiotherapists work in both the public and private sectors and are often a primary point of contact for patients. Despite being ideally placed to assist with HBC, fiscal restraints on healthcare systems and budgetary constraints have put extra pressures on frontline staff, despite calls for an increase in the supply of physiotherapists (Bacon and Associates, 2001).

In terms of health promotion it has been suggested that even when illness or disability is the reason a person seeks treatment from a physiotherapist, their health priorities should be addressed irrespective of their diagnosis (Dean, 2009b). A framework promoting this idea, titled 'Making Every Contact Count', has been produced by the National Health Service in the UK which aims at using every contact with patients and the public as an opportunity to help change behaviour (de Normanville et al., 2011). This is similar to the HSE's recent Health Promotion Strategic Framework (Health Service Executive, 2012). This report recommends health promotion be provided by health care professionals at every opportunity (Health Service Executive, 2012). To assist with this the Health Promotion and Improvement Service was established by the Health and Wellbeing division of the HSE. This service is responsible for promoting and improving health within and outside the healthcare system. There is evidence that physiotherapists are putting these policies into practice. The 'Make Every Contact Count' policy has been adopted by the physiotherapy department in St. James's Hospital, Dublin (Sunderland and O'Hanlon, 2013).

Despite the changing healthcare environment recent research has shown that proficiency in promoting behavioural change and self-efficacy is not a focus of entry-to-practice level physiotherapy education in Ireland, both in the curriculum and clinical education (O'Donoghue et al., 2012, O'Donoghue et al., 2011). Possessing the knowledge and skills to facilitate behaviour change and to assist patients in becoming autonomous self-managers should be viewed as a basic clinical competency for contemporary physiotherapists. Education in Ireland is not unique in this. Research on 116 physiotherapy programmes in six countries concluded that although health

promotion is part of the curriculum in most institutions, instruction method, time allocated and content may be insufficient (Bodner et al., 2013).

1.3 Rationale for the current study

The topic of motivation, HBC and eliciting adherence in the physiotherapy profession requires further research. Further studies are required to evaluate the physiotherapy literature on HBC interventions. Although recommendations and guidelines are in place, there is a need for a large profession-wide study to establish how current practising physiotherapists are actually motivating patients, assisting with HBC and eliciting adherence. The changing healthcare environment and a study of contemporary practice could identify gaps in practice and inform developments in education. A study investigating and evaluating education of qualified (post-registration) and student physiotherapists (pre-registration) is also required to identify possible barriers to implementation. These gaps in the current evidence directly informed the development of the aims and objectives of this PhD.

1.4 PhD aims and objectives

The overall aim of this PhD is to investigate the use of motivational strategies by physiotherapists to promote HBC. The PhD aims to review contemporary practice and provide recommendations for the development of future physiotherapy education and practice.

The objectives are as follows

- To systematically review the literature to discover and evaluate the evidence for adding motivational interventions to traditional physiotherapy to increase physiotherapy adherence to and elicit health behaviour change in the form of increasing physical activity.
- To explore the most successful psychological theories that emerged from the systematic review.
- To investigate both the levels of knowledge among physiotherapists and the

methods currently employed by members of the profession to optimise adherence and elicit health behaviour change.

- To investigate the use of Motivational Interviewing (MI) among physiotherapists who have completed a level one MI course.
- To investigate the effectiveness of a level one MI course for physiotherapy students at the entry-to-practice level of physiotherapy education.

The aim of the PhD and the progression of the objectives are presented in figure 1.1

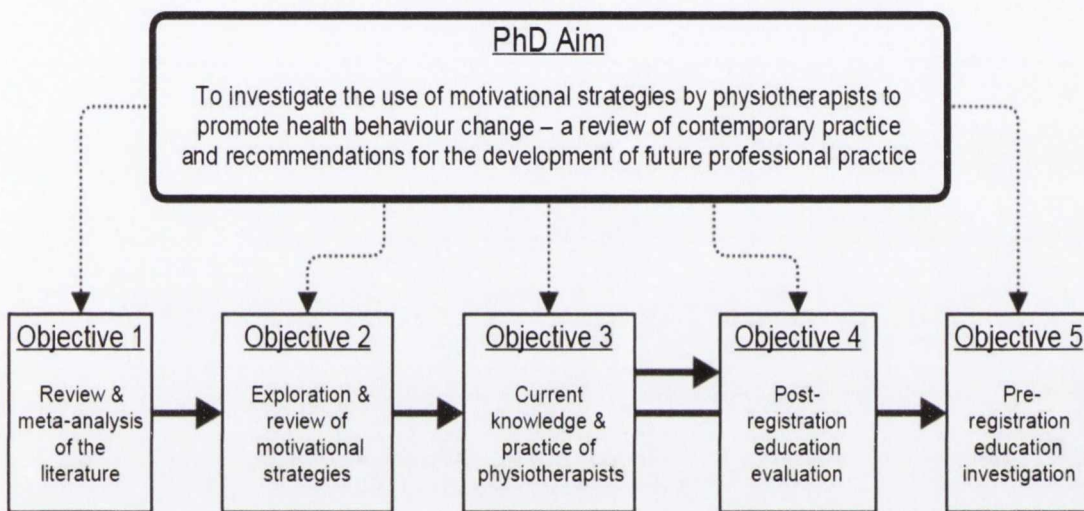


Figure 1.1 PhD aim and objectives flow chart

1.5 Summary of chapters

This thesis will include six chapters. The first chapter is this introductory chapter, which explores the background to the study area. Chapter 2 will report on the method used to achieve the first two objectives and will report their findings. These objectives are a review and meta-analysis of the literature and an exploration and review of motivational strategies. Chapter 3 will report and discuss the methods and findings of Study I of this PhD, an investigation of both the levels of knowledge among physiotherapists and the methods currently employed by members of the profession in optimising adherence and eliciting health behaviour change. Chapter 4 will report and discuss the methods and findings of the second study of this PhD. Study II was an investigation of the use of

motivational interviewing (MI) among physiotherapists who completed a 2-day level one MI course. The third and final study will be reported in Chapter 5, where the methods and the findings of an investigation of the effectiveness of a level one MI course for physiotherapy students at the entry-to-practice level of education will be presented and discussed (Figure 1.2). The final chapter will draw conclusions from all the research conducted during the course of this PhD.

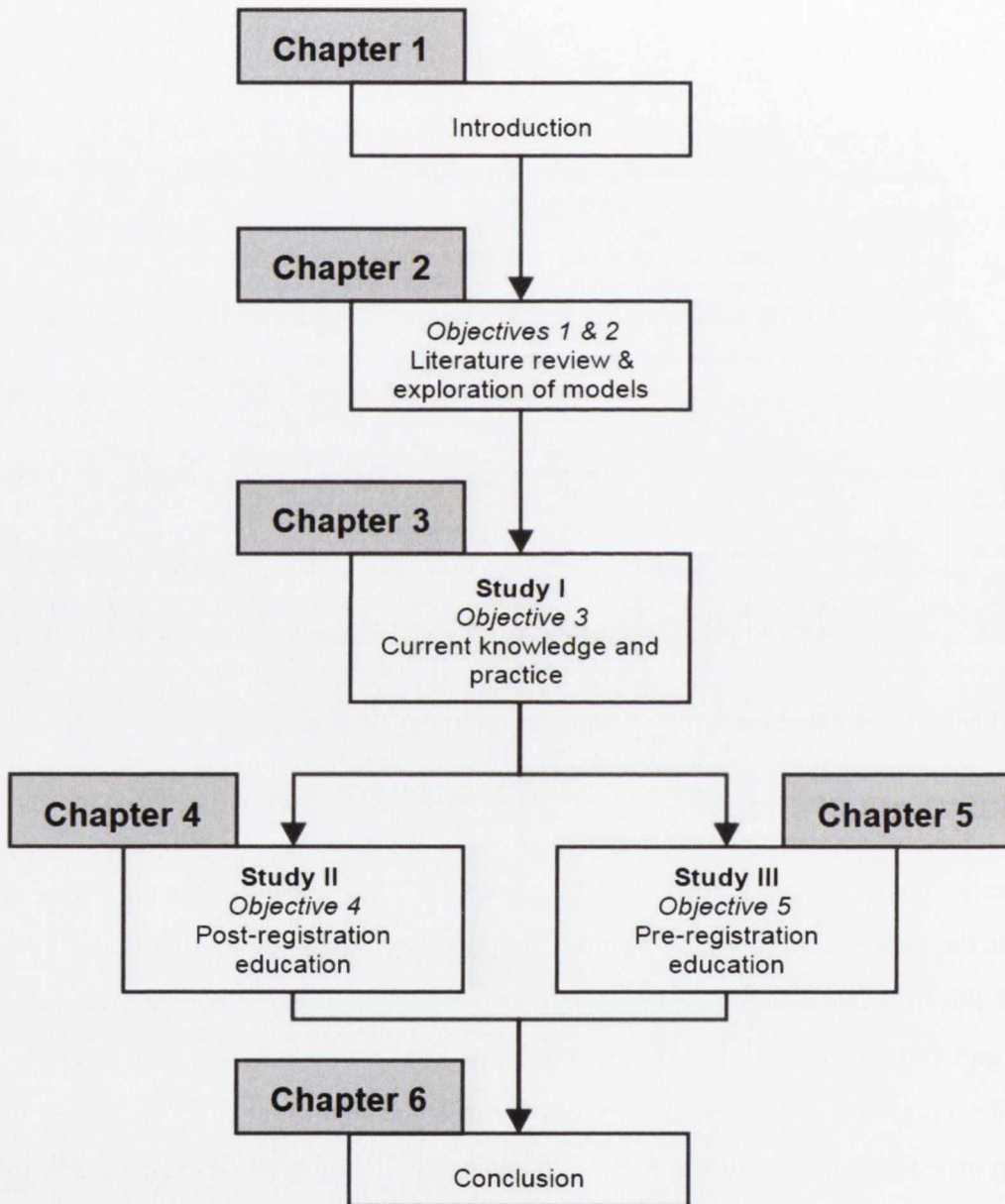


Figure 1.2 Chapter summary

Each chapter will begin with a figure of the PhD flow chart (Figure 1.1) with the corresponding objective highlighted, completed objectives will be coloured green and future incomplete objectives coloured grey.

1.6 Conclusion

The overall aim of this chapter was to introduce the research that will be conducted in this PhD. An overview of how healthcare in the 21st century is evolving and the importance of HBC was provided. How the physiotherapy profession is ideally placed to prosper in the evolving healthcare environment was discussed. The chapter presented the aims and the objectives of this thesis and concluded with a summary of the layout of the research conducted.

Chapter 2. Systematic review of the literature and exploration of models

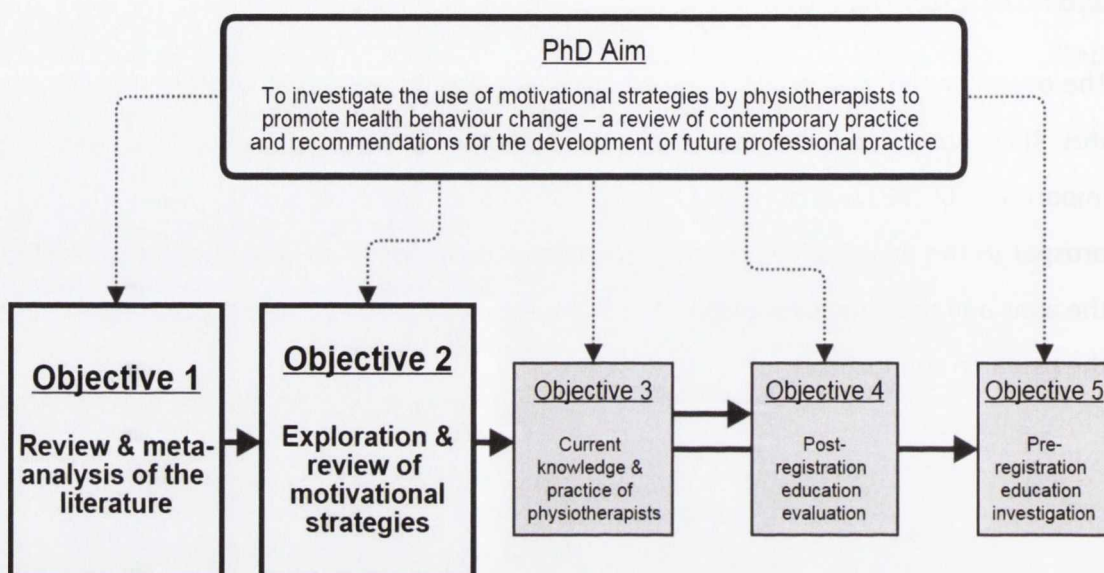


Figure 2.1 PhD flow chart

2.1 Introduction

As previously outlined in Chapter 1, promoting physical activity and adherence to physiotherapy is an essential component of physiotherapy practice and should be undertaken in an evidence-based manner. Hence, possessing the knowledge and skills to facilitate behaviour change should be viewed as a clinical competency for contemporary physiotherapists (Dean, 2009b). The aim of this chapter is to evaluate the evidence for the effectiveness of adding motivational interventions to traditional physiotherapy practice and to explore and discuss psychological theories investigated in the review to elicit health behaviour change (HBC). This chapter will therefore be divided into two sections; Part A and Part B. Part A will report the methods and results of the systematic literature review and will discuss the findings and implications of the review. The motivational interventions included and investigated in Part A are based on psychological theories which are not currently a routine part of current physiotherapy

practice and education (O'Donoghue et al., 2014, Bodner et al., 2013, O'Donoghue et al., 2012, O'Donoghue et al., 2011). Four of the most commonly investigated and successful psychological models from Part A are explored in Part B. This exploration will include the origins of each theory, description of the four theoretical models and how each can be utilised by physiotherapists.

The literature review was published in January 2015 (McGrane et al., 2015) and the exploration of the models was published in April 2014 (McGrane et al., 2014).

2.2 Part A: Systematic review of the literature

2.2.1 Aims and objectives

The overall aim is to systematically review the literature to discover and evaluate the evidence for the effectiveness of adding motivational interventions to traditional physiotherapy to increase short and long-term adherence to physiotherapy and elicit HBC in the form of increasing physical activity. The objectives are as follows:

- To review the effectiveness of motivational interventions based on psychological theories to increase adherence and elicit HBC.
- To perform statistical analysis, in the form of meta-analyses, on the effects of the interventions on attendance to physiotherapy, self-efficacy and activity limitations.

2.2.2 Methods

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standardized reporting guidelines were followed for the conduct and reporting of this review (Liberati et al., 2009, Moher et al., 2010).

2.2.2.1 Identification of the literature

The author (NMG) and the study supervisors (ES and TC) agreed on the search terms after the author consulted with a medical librarian (DM). A systematic literature search was conducted of the following databases; PubMed, EMBASE, Scopus, CINAHL, PsychINFO, AMED and Allied Health Evidence database to identify relevant studies. The

search was conducted as per the specific requirements of each database using the following keywords: (Exercise OR Physical Activity) AND Motivation AND (Adherence OR Compliance OR Sustainability) AND (Physiotherapy OR Physical Therapy). Subject heading searches were completed using the following subject headings "Motivation"[Mesh] AND ("Exercise"[Mesh] OR "Motor Activity"[Mesh]) AND "Patient Compliance"[Mesh] AND "Physical Therapy Modalities"[Mesh] and 'motivation'/exp AND 'physical activity, capacity and performance'/exp AND 'physiotherapy'/exp AND 'patient attitude'/exp. References in the articles identified were screened to identify additional citations.

2.2.2.2 Selection criteria - Inclusion and exclusion criteria

The inclusion and exclusion criteria were agreed upon by the author and the study supervisors. The inclusion criteria for articles were based on the PICO (Population, Intervention, Compare and Outcome) (Hastings and Fisher, 2014) design as follows:

- All adult study populations were included.
- Motivational interventions as part of a package, psychological strategies, theory based instructional manuals, internet based behavioural programmes and relapse prevention and reinforcement strategies were included.
- Randomised controlled trials (RCTs) comparing two or more arms with one arm focused on the effect of a motivational intervention in addition to exercise and one alternative control arm were included.
- All types of exercise and exercise delivery methods were included.
- All measures of adherence were included. Secondary measures of adherence included all outcomes at the level of impairment, activity limitation and participation restriction, in keeping with the International Classification of Functioning, Disability and Health (World Health Organisation, 2001).
- Articles were excluded if the article was published in a language other than English. Papers were excluded if the intervention was educational only, such as educational video or computer sessions. Subsidisation or money as motivation,

differential reinforcement techniques or use of pets as motivation were excluded.

2.2.2.3 Study selection

Suitable studies were selected in a three-stage process. Firstly the author (NMG) and one of the study supervisors (TC) identified and screened the titles retrieved through the searches. In the second stage the author and the other study supervisor (ES) assessed the abstracts of articles that were not eliminated based on their title. If a disagreement occurred the full text was assessed. The third stage involved cases where a disagreement persisted and a third reviewer (TC) assessed these full texts for suitability.

2.2.2.4 Data extraction

Data extraction was completed independently by the author (NMG). Data extracted for the meta-analysis included mean, median and standard deviation for all outcome measures for each group at every time point. This was reviewed by a second person (RG) with experience in meta-analysis and systematic literature reviews. Data extracted for the narrative review was reviewed by the study supervisor (ES), and included authors, study setting, sample population and size, type and duration of the intervention, mode and frequency of delivery and outcome measures used for every study.

2.2.2.5 Methodological quality assessment

Methodological quality of the studies was assessed using the Cochrane Risk of Bias Tool (Appendix 2). This tool includes six domains of bias; selection bias, performance bias, detection bias, attrition bias, reporting bias and other bias. Within each domain, assessments are made for one or more items, which may cover different aspects of the domain, or different outcomes. A domain was considered to have a low risk of bias if all the criteria within the domain were met. If one or more criterion was not met or only partially met, the domain was considered to have an unclear risk or high risk of bias (Higgins et al., 2011).

The internal and external validity of the studies was assessed using the Physiotherapy Evidence Database (PEDro) scale (Appendix 3). The PEDro scale is a valid and reliable tool (Macedo et al., 2010, Maher et al., 2003). It includes 11 items, scored 0 or 1

resulting in a maximum score of 11 points. Studies scoring seven or more points are considered to have moderate to high methodological quality.

The author (NMG) and a study supervisor (ES) independently assessed the methodological quality of each study using both of the tools described above. Two independent assessors are recommended due to the fact that judgements on each domain are to be made (Higgins, 2011). Disagreements were resolved through discussion. If information, which was required to make a decision on one of the domains was missing from the published article, the authors were contacted in an effort to obtain it.

2.2.2.6 Statistical analysis

Statistical analysis was conducted using Review Manager (RevMan) Version 5.17 software from the Cochrane collaboration. In studies with multiple comparison groups, the most relevant comparison group was chosen for analysis: for example, where comparisons consisted of exercise and motivational intervention compared with other active treatments or routine care, the routine care group was chosen to represent the comparison group. Authors were contacted if further information was needed. The differences in outcomes between the control and the intervention group at the end of the intervention and at all follow-up time points were used as the mode of analysis. A number of different scales or instruments were employed to assess the same outcome. The standard mean difference with 95% confidence interval (CI) was therefore used as the primary measure to assess treatment effect. The impact of sample size was addressed by estimating a weighting factor for each study, and assigning larger effect weights in studies with larger samples. In studies where the mean was unknown, authors were contacted. If it remained unknown the median was used as a proxy and the standard deviation was calculated based on 0.75 interquartile range or 0.25 x range (Hozo et al., 2005). Statistical heterogeneity was measured using the I^2 statistic. $I^2 \leq 50\%$ was used as the cut-off point for acceptable heterogeneity, and the fixed-effects model (FEM) was applied below this point. When $I^2 > 50\%$, the more conservative random-effects model (REM) was used.

2.2.3 Results

2.2.3.1 Study identification and selection

The search (described in section 2.2.1) identified 493 articles of which 111 were duplicates. Studies were eliminated if both reviewers (NMG and TC) agreed that the title clearly identified that the study did not include a motivational intervention (n=280). The abstracts of the remaining studies (n=102) were read and two reviewers (NMG and ES) agreed on eliminating seventy four. The agreement rate between the reviewers on studies to include and eliminate was 91.1%. Due to disagreement the full texts of nine articles were reviewed and a further five were eliminated. The full texts of two articles were reviewed by all three reviewers (NMG, ES and TC) and one was eliminated. A total of twenty two articles remained. Of these, four articles reported results from two study populations and six failed to meet the inclusion criteria; therefore on completion of the selection process sixteen articles, reporting from fourteen studies, remained. The PRISMA flow diagram contained in Figure 2.2 presents the flow of studies through the selection process review.

2.2.3.2 Methodological quality

Table 2.1 presents the details of the methodological quality assessment. Four studies had poor internal and external validity, scoring under four on the PEDRO scale (Schelling et al., 2009, Sniehotta et al., 2005, Brodie et al., 2008, Brodie and Inoue, 2005, Marcus and Stanton, 1993). The remainder of the studies ranged from 5 to 8 points on the scale. Allocation concealment was only specified in three studies (Basler et al., 2007, Befort et al., 2008, van Weert et al., 2010). Blinding emerged as an issue from the methodological quality assessment tools. No study was classified as having a low risk of performance bias while all but four studies had a low risk of detection bias (Vong et al., 2011, Basler et al., 2007, Annesi et al., 2011, Befort et al., 2008). The results of the methodological assessments indicated that blinding of participants, interventionists and assessors is very difficult in trials of this nature. Blinding is a challenge in behavioural interventions as subjects and interventionists inherently know if they are receiving/delivering the intervention. Blinding of assessors may serve to eliminate detection, observer

expectation and interviewer bias. Of the included studies only four (Vong et al., 2011, Befort et al., 2008, Basler et al., 2007, Annesi et al., 2011) blinded their assessors.

During the course of the methodological quality assessment 13 authors were contacted to request further information. Five authors replied providing the required information.

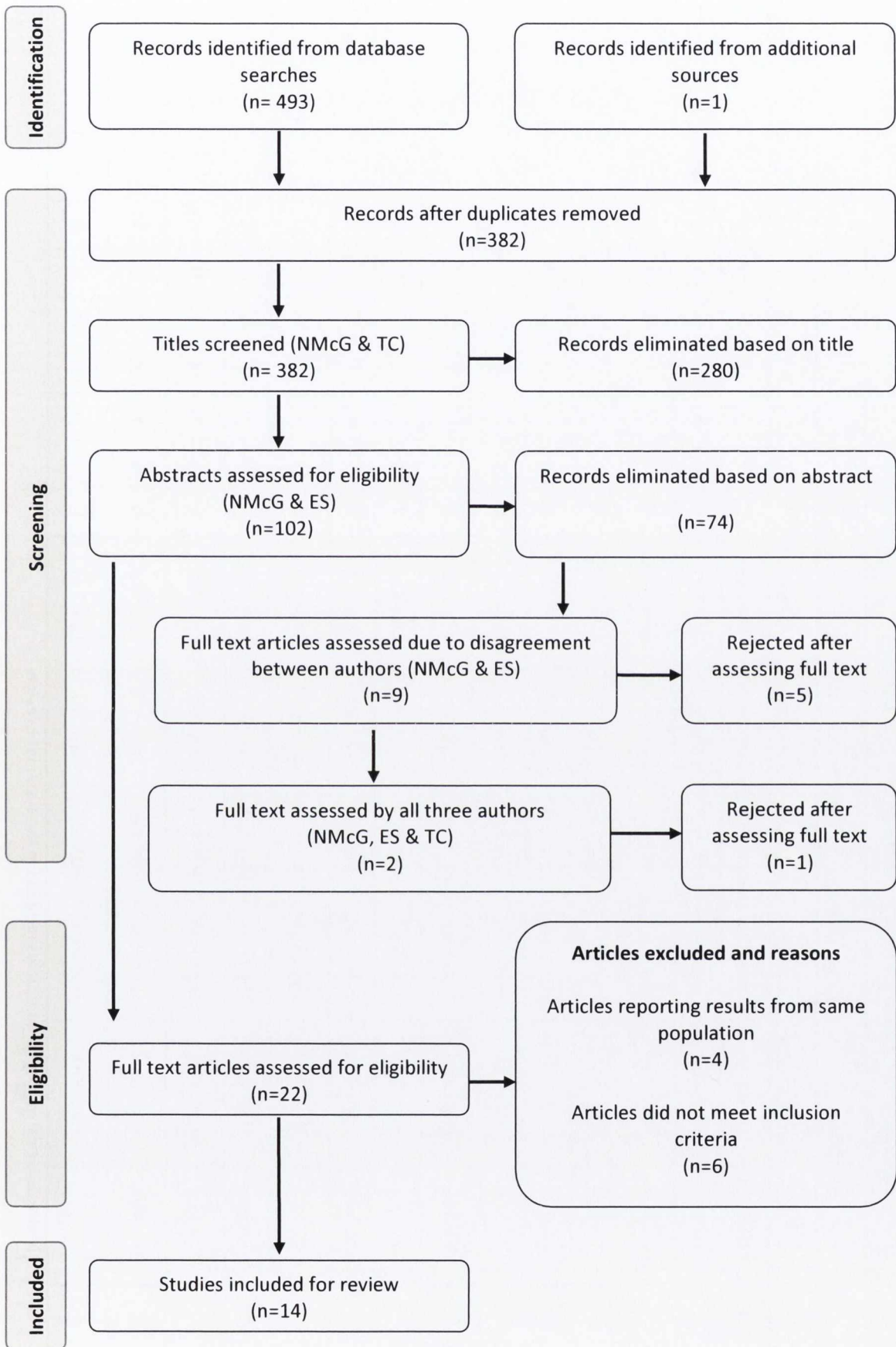


Figure 2.2: PRISMA flow diagram

Authors	Cochrane Biases						PEDro Scale											
	Selection	Performance	Detection	Attrition	Reporting	Other	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	Score
Annesi et al '11	High Risk	High Risk	Low Risk	Low Risk	Low Risk	Low Risk	Y	Y	N	Y	Y	N	Y	N	Y	Y	Y	8
Vong et al '11	Low Risk	High Risk	Low Risk	Low Risk	Low Risk	Low Risk	Y	Y	N	Y	N	N	Y	N	Y	Y	Y	7
Silva et al '10	High Risk	High Risk	High Risk	Low Risk	Low Risk	Low Risk	Y	Y	N	Y	N	N	N	Y	Y	Y	Y	7
van Weert et al '10	High Risk	High Risk	High Risk	Low Risk	Low Risk	Low Risk	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	8
Millen & Bray '09	High Risk	High Risk	High Risk	Low Risk	Low Risk	Low Risk	Y	Y	N	Y	N	N	N	Y	N	Y	Y	6
Schelling et al '09	High Risk	High Risk	High Risk	High Risk	Low Risk	Low Risk	Y	Y	N	N	N	N	N	N	N	Y	Y	4
Brodie et al '08/'05	High Risk	High Risk	High Risk	High Risk	High Risk	Unclear Risk	Y	Y	N	N	N	N	N	N	N	Y	Y	4
Befort et al '08	Low Risk	High Risk	Low Risk	High Risk	High Risk	Low Risk	Y	Y	Y	Y	N	N	Y	N	N	Y	Y	7
Basler et al '07	Low Risk	High Risk	Low Risk	Low Risk	Low Risk	Low Risk	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	9
Gohner & Schlicht '06	High Risk	High Risk	High Risk	Low Risk	Low Risk	Low Risk	Y	Y	N	Y	N	N	N	Y	N	Y	Y	6
Asenlof et al '05	High Risk	High Risk	High Risk	Low Risk	Low Risk	Low Risk	Y	Y	N	Y	N	N	N	N	Y	Y	Y	6
Friedrich et al '05/'98	High Risk	High Risk	High Risk	High Risk	Low Risk	Low Risk	Y	Y	N	N	N	N	N	Y	Y	Y	Y	6
Sniehotta et al '05	Low Risk	High Risk	High Risk	High Risk	Low Risk	Low Risk	N	Y	N	N	N	N	N	N	Y	Y	Y	3
Marcus & Stanton '93	Unclear Risk	High Risk	High Risk	High Risk	Low Risk	Low Risk	Y	Y	N	N	N	N	N	N	N	Y	Y	4

Table 2.1 Methodological quality of the studies included in the systematic review

2.2.3.3 Study characteristics

Table 2.2 presents the characteristics of the included studies. Five studies investigated patients with chronic musculoskeletal pain (Vong et al., 2011, Gohner and Schlicht, 2006, Friedrich et al., 1998, Friedrich et al., 2005, Basler et al., 2007, Asenlof et al., 2005), four of which studied patients with chronic low back pain (CLBP) (Vong et al., 2011, Gohner and Schlicht, 2006, Friedrich et al., 1998, Friedrich et al., 2005, Basler et al., 2007). Four studies investigated obesity (Silva et al., 2010, Schelling et al., 2009, Befort et al., 2008, Annesi et al., 2011), three studies investigated patients enrolled in cardiac rehabilitation (Millen and Bray, 2009, Brodie et al., 2008, Sniehotta et al., 2005, Brodie and Inoue, 2005), one study investigated fatigue in patients with cancer (van Weert et al., 2010) and one study investigated sedentary females (Marcus and Stanton, 1993).

Six different theories informed the interventions. Four studies were based on cognitive behavioural theory (CBT) (van Weert et al., 2010, Schelling et al., 2009, Gohner and Schlicht, 2006, Asenlof et al., 2005). Motivational interviewing (MI) (Vong et al., 2011, Befort et al., 2008, Brodie et al., 2008, Brodie and Inoue, 2005) and social cognitive theory (SCT) (Annesi et al., 2011, Millen and Bray, 2009, Sniehotta et al., 2005) were used three times. Self-determination theory (SDT) (Silva et al., 2010), trans-theoretical model (TTM) (Basler et al., 2007) and social learning theory (SLT) (Marcus and Stanton, 1993) were each used once. One study did not base their intervention on a defined theory (Friedrich et al., 1998, Friedrich et al., 2005). The wide range of conditions and theories resulted in many different outcome measures being employed. Primary and secondary outcome measures, timing of assessments and study results are detailed in Table 2.2.

Table 2.2 Descriptive characteristics of studies included in the systematic review

Authors Year	DATA EXTRACTION							Control
	Intervention							
	Target group (n)	Description: form	Description: duration, frequency, timing	Based on what construct	Delivered by whom and what setting	Exercise component		
Annesi et al 2011	Obese females (137)	One-on-one sessions supported by computer programme Self-management & self-regulatory techniques Increasing mastery & competence	Six 1-hour meetings with Wellness Specialist over 6 months	The Coach Approach/SCT	One-on-one sessions in the wellness centre with a Wellness Specialist trained in The Coach Approach	Three exercise sessions per week at 60-75% maximal O ₂ uptake	Standard wellness-centre practice Time with exercise specialists matched	
Vong et al 2011	Chronic low back pain (76)	Motivational enhancement therapy (MET) delivered during physiotherapy sessions MI strategies	Ten 30-minute sessions delivered during physiotherapy sessions over 8-weeks	MET/MI	Physiotherapists trained in MET delivered intervention during physiotherapy session	Ten 30-minute session plus 15-minute interferential plus tailored back exercise programme	Same exercise component with usual communication	
Silva et al 2010	Obese females (239)	Five modules in total Educational content, interactive discussion, small group activities on PA and exercise, nutrition and eating behaviour, cognitive & behavioural aspects (motivation and overcoming barriers), promoting self-determination and improving body image	Thirty 120-minute, group (25-30) meetings weekly/ bi-weekly	SDT	Intervention team: six PhD/ M.Sc exercise physiologists, nutritionists/ dieticians & psychologists	No supervised exercise/physical activity	Twenty-nine general health education sessions.	

Authors Year	Intervention							Control
	Target group (n)	Description: form	Description: duration, frequency, timing	Based on what construct	Delivered by whom and what setting	Exercise component		
Millen et al 2009	Cardiac rehab (40)	Instruction manual	Self-directed: SCT based instruction manual Six upper limb strengthening exercises with Thera-Band	SCT	Self-directed at home	Resistance training manual and Thera-Band resistive bands and exercises prescribed by the cardiac rehabilitation team	Exercise as prescribed by cardiac rehabilitation team	
Schelling et al 2009	Obese adults (38)	Group session offering individualized treatment approach using well known CBT strategies	One 90-minute session	CBT	Led by clinical psychologist and student co- therapist following standardized manuals	Eight weekly 50-minute progressive aerobic individually prescribed sessions (both groups)	One 90-minute relaxation session	
Befort et al 2008	Obese African American women (34)	Semi-structured format focusing on target behaviours identified by participants	Four 30-minute sessions at weeks 0, 3, 8, 7 and 13	MI	Two in-person and two phone sessions by counsellors supervised by doctoral level clinical psychologist	Sixteen 90-minute sessions. Groups of 12-14. Weekly weight in and self- monitoring logs (diet and physical activity). Weekly topic and cultural adoptions	Four sessions on health education with the same duration, frequency, timing and counsellor	
Brodie et al 2008/ 2005	Adults aged 65-years with chronic heart failure (60)	Problem solving techniques and behaviour change strategies	Eight weekly 1-hour sessions	MI	Researcher experienced in MI techniques with no clinical qualifications	Encouraged to increase physical activity	Usual Care: information and recommendations to increase physical activity	

Authors Year	Intervention						
	Target group (n)	Description: form	Description: duration, frequency, timing	Based on what construct	Delivered by whom and what setting	Exercise component	Control
Basler et al 2005	Older adults with chronic low back pain (152)	Standardized counselling service aimed at increasing self-efficacy, positively influencing decisional balance, enhancing commitment, self- reinforcement, and use of social support to deal with relapse	5-weeks, ten sessions, 20-minutes standard treatment manual and homework 10 minutes before session	TTM	Same physiotherapists who delivered treatment 10 minutes before treatment session Physiotherapist received 8 hours of TTM training	5 weeks, ten sessions: 20 minutes standard treatment with a manual and homework 10 minutes of inactive ultrasound before session	
Sniehotta et al 2005	Coronary heart disease post cardiac rehab (199)	Planning: planning booklet with sheets for action and coping plans Planning plus Diary: as above plus six weekly diaries asking how often during the last 7 days did plan occur and how optimistic were they that plan would occur for next 7 days	Booklet provided on discharge for in-patient cardiac rehabilitation	SCT/ Planning and action control	Booklet At Home In case of questions, trained interviewers on hand	Standard care: recommended to increase physical activity in general, engage in regular strenuous exercise and participate in cardiac sports groups	Standard Care
Asenlof et al 2005	Musculo- skeletal Pain >4 weeks (122)	Seven phases: behavioural goal identification, self- monitoring, individual functional behavioural analysis, basic & applied skill acquisition, generalization and maintenance and relapse prevention	Eight to ten sessions over 2-3 months plus homework One to two booster sessions after 1 and 3 months	CBT	Physiotherapists who attended seven 3-hour CBT training sessions (21-hours)	Own physical activity of choice at home	Eight to ten best practice physiotherapy sessions

Authors Year	Intervention							Control
	Target group (n)	Description: form	Description: duration, frequency, timing	Based on what construct	Delivered by whom and what setting	Exercise component		
Friedrich et al 2005/ 1998	Chronic low back pain (93)	Five interventions: counselling and information strategies, reinforcement techniques, posted treatment contract and exercise diary	Ten sessions Two to three per week No other information	Own	Physiotherapists No information	Ten 25-minute individual progressive exercise sessions with physiotherapists Advised to exercise daily	Physiotherapy sessions only	
Marcus & Stanton 1993	Sedentary females (120)	Relapse Prevention (RP): identification of non- adherence triggers, development of effective coping strategies and employment of planned relapse. Reinforcement: rewards for exercise attendance	Eighteen 20-minute weekly sessions	RP & Reinforcement developed from Social Learning Theory	Advanced post- graduate students supervised by faculty psychologist	18-week strength, flexibility & aerobic dance programme (35 minutes for weeks 1-3, 50 minutes for week 4-18)	Exercise sessions only	

Table 2.3 Outcome measures employed and results in the studies included

Data Extraction: Results					
Authors Year	Measures		Assessment time points	Results	
	Primary	Secondary		Primary	Secondary
Annesi et al 2011	Exercise session attendance	Physical self-concept scale of the Tennessee self-concept scale Exercise Barriers Self Efficacy Scale Profile of mood states – short form The Body Areas Satisfaction Scale of the Multidimensional Body Relations Questionnaire	Baseline 4-weeks (immediately post-intervention) 16-weeks (12- weeks post intervention)	Significantly greater attendance for the intervention group ($p < .001$)	Significant difference between groups for all outcomes ($p = .02$)
Vong et al 2011	Motivational status: Pain Rehabilitation Expectations Scale and Pain Self- Efficacy Questionnaire	Pain: Visual analogue scale Physical Function: Range of trunk motion, lifting capacity test and Short form-36 physical subscales (physical function, role-physical, bodily pain, general health) Roland Morris Disability Questionnaire Exercise compliance: log book	Baseline After sessions 1 (Pain Rehabilitation Expectations Scale only), 5 and 10 1-month after cessation of treatment	Significant difference between groups for proxy efficacy ($p < .001$), working alliance ($p < .001$) and treatment expectancy ($p = .011$)	Visual analogue scale: significant difference within groups ($p < .001$) Lifting capacity: significant difference within groups ($p < .001$) SF-36: significant difference within groups ($p < .05$). Significant difference between group in general health ($p = .015$) Roland Morris Disability Questionnaire: significant decrease within groups ($p < .001$) Home exercise: significant difference between groups at all time points ($p = .002$)

Authors Year	Measures		Assessment time points	Results	
	Primary	Secondary		Primary	Secondary
Silva et al 2010	Weight, BMI, body composition Physical activity: accelerometer, pedometer and 7-day physical activity recall in interview format Dietary intake: 24-hour diet records	Health Care Climate questionnaire The Treatment Self-Regulation Questionnaire The Self-Determination Scale The Locus of Causality for Exercise Scale The Exercise Self-Regulation Questionnaire The Intrinsic Motivation Inventory The Exercise Motives Inventory-2	Baseline 4 months (weight, BMI, body composition & exercise SDT relevant variables) 12 months (end of intervention)	Physical activity: significant difference in favour of the intervention group in steps per day ($p \leq .001$), more minutes in moderate to vigorous physical activity ($p \leq .001$) and lifestyle physical activity at 12 months ($p \leq .001$) Body composition: significant difference in favour of the intervention group in fat mass ($p < .001$), lean mass ($p < .001$), % body fat ($p < .001$) and BMI ($p < .001$) at 12 months Above correlated with attendance	Higher level of self-determination ($p \leq .05$), autonomous self-regulation for treatment ($p \leq .001$), exercise intrinsic motivation ($p \leq .001$), autonomous self-regulation ($p \leq .001$), internal locus of causality ($p \leq .001$), psychological exercise motives ($p \leq .001$) and fitness exercise motives ($p \leq .05$) reported by the intervention group
Van Weert et al 2010	Multi-dimensional Fatigue Inventory	Adherence to intervention and exercise sessions	Baseline 12-weeks (immediately post intervention)	Control group: significance difference in all domains of fatigue compared to Dutch population ($p < .001$) Experimental groups: Significant difference in general and mental fatigue ($p < .05$) compared to Dutch population For all groups: within group significant differences; general ($p < .001$), physical ($p < .001$) and mental ($p < .001$) fatigue and reduced activation ($p < .001$) Between groups: significant differences in general ($p < .01$), physical ($p < .001$), mental fatigue (low education) ($p < .05$) and reduced motivation ($p < .05$) in favour of the physiotherapy group versus control Physiotherapy + CBT versus control: significant differences in physical fatigue ($p < .01$)	Adherence: no difference

Authors Year	Measures		Assessment time points	Results	
	Primary	Secondary		Primary	Secondary
Millen & Bray 2009	Self-efficacy for training technique (own scale) Self-efficacy for adherence (own scale)	Outcome expectations (own scale) Exercise adherence (log books) 1-week exercise recall using modified version of physical activity Scale for the Elderly Questionnaire	Baseline 4 weeks (immediately post- intervention): log books only 3 months post- intervention: physical activity scale for the elderly	Significant difference between groups in favour of the intervention for self-efficacy of technique (p=.006) and adherence (p=.04) at 4 weeks	Outcome expectations between groups neared significance (p=.06) Significantly more exercises (p<.01) and sets (p<.01) at 4 weeks by the intervention group At 3 months significantly more days exercising (p=.05) and different exercises approached significance (p=.06) for the intervention group
Schelling et al 2009	Adherence: session attendance Physical activity: weekly exercise diaries	Motivational Stage: 1-item algorithm	Baseline 8 weeks 3 months 6 months	Adherence: significant difference in dropouts between groups (p=.04). No difference with attendance Physical activity: significant difference between groups at 6 months (p=.044) Weekly minutes spent on physical activity: significant difference over time for interaction group (increase) (p=.002) and control (decrease) (p=.018)	Motivational stage: no significant difference

Authors Year	Measures		Assessment time points	Results	
	Primary	Secondary		Primary	Secondary
Befort et al 2008	Adherence: session attendance, logs turned in and level of completion	Dietary intake: 24-hour recall USDA multiple-pass approach Physical activity: Champs physical activity measure Weight & Height Motivation: Treatment Self-Regulation Questionnaire Self-Efficacy for diet and exercise: own based on Bandura's	Baseline 16 weeks (post-intervention)	No difference between groups	Diet: no between group change Significant effect on some aspects of diet for both groups over time ($p=.001-.007$) Physical activity: no difference Weight: both groups had a significant decrease in weight ($p=.003$) Motivation: Motivation ($p=.001$) and self-efficacy ($p=.01$) decreased over time. No between group differences
Brodie et al 2008/ 2005	Physical activity: leisure-time physical activity questionnaire (kcal/kg/day) 3-day diary Exercise capacity: 6-minute walk test (6-MWT)	Short Form-36 Health Survey Minnesota Living with Heart Failure Questionnaire (MLHF) Readiness to change ruler	Baseline 5 months	PA: group 1 (MI & Standard care) and group 3 (MI) significant increase in energy expenditure (kcal/kg/day) ($p<.01$) 6-MWT: All groups increased significantly ($p<.0001$)	Significant difference within groups for role limitations for physical and social functioning and changes in health status ($p<.05$). Most change in the MI group MLHF: no significant difference Readiness to change: at baseline 98% in pre-contemplation /contemplation stage. At 5 months 48% in preparation, 22% in contemplation, 13% in action and 8% in pre-contemplation.

Authors Year	Measures		Assessment time points	Results	
	Primary	Secondary		Primary	Secondary
Basler et al 2007	Physical activity: 7-day activity diary	Functional capacity: Hannover Functional Disability Scale (self-reported) ROM: Ultrasound topometry	Baseline 6-7 weeks 6 months	Both groups significantly increased physical activity ($p < .01$), no difference between groups	Functional capacity: Both groups significantly improved ($p < .01$), no difference between groups ROM: No difference
Göhner & Schlicht 2006	Self-efficacy: own measure Barriers: own measure Severity: own measure Intention: own measure Behaviour: own measure	Pain: numeric rating scale	Baseline 6-8 weeks 3-5 months 6.5-11 months	Self-efficacy and barriers: significant difference between groups at all assessments ($p = .001$) and within intervention group over time ($p = .001$) Severity: significant difference between groups at fourth assessment ($p = .001$) Intention: significant difference between groups at assessments three ($p < .001$) and four ($p = .004$). Significant difference within intervention group over time ($p = .001$) Behaviour: significant difference between groups at assessments three ($p = .009$) and within intervention group over time ($p = .001$)	Pain: significant difference within experimental group ($p < .001$) and control group ($p = .004 - p = .02$) no significant difference between groups
Sniehoff et al 2005	Questionnaire assessing behavioural intentions, self-efficacy, planning & action control	General physical exercise: Kaiser physical activity survey (adapted to cardiac rehabilitation patients)	Baseline 2 months following discharge from in-patient stay 4 months following discharge from in-patient stay	Both experimental groups significantly higher than control for action control at 2 ($p < .01$) and 4 months ($p < .01$) and for coping planning at 2 ($p < .01$) and 4 months ($p < .01$) No difference for action planning Behavioural Intentions: both experimental groups significantly different at 2 ($p < .01$) and 4 months ($p < .05$) Self-efficacy: planning and diary group significantly different than control at 2 months ($p < .05$). Both experimental groups significantly different than control at 4 months ($p < .05$)	General PA: significant difference between planning group and control at 2 months ($p < .05$). No difference at 4 months Strenuous exercise: planning and diary group significant difference with control at 2 months ($p < .05$). Both experimental groups significantly different at 4 months ($p < .01$)

Authors Year	Measures		Assessment time points	Results	
	Primary	Secondary		Primary	Secondary
Asenlof et al 2005	<p>Pain Disability: Pain Disability Index (Self-reported)</p> <p>Pain: average, mildest & maximal over last 2 weeks on numeric rating scale</p> <p>Self-efficacy in performing activities of daily living: self-efficacy scale in twenty activities of daily living</p>	<p>Fear of movement/re-injury: Tampa Scale of Kinesiophobia</p> <p>Physical performance (first & final treatment sessions): five tests; sit, push and back-ups, Functional lifting: PILE</p> <p>Cervical lifting test & Stair climbing</p> <p>Global improvement 3 months after treatment: seven items</p>	<p>Baseline</p> <p>Post-intervention</p> <p>3 months post-intervention</p>	<p>Pain related disability: reduced for both groups and maintained at 3 months (p=.01). Significant difference between groups (P=.001)</p> <p>Pain: decreased for both groups (p=.02) and significant difference between groups (p=.001)</p> <p>Self-efficacy: increased for both groups (p=.0001), no significant difference between groups</p>	<p>Fear of Movement: significant decrease with time for both groups (p.022) and significant difference between groups (p=.044) (not at 3 months)</p> <p>Physical performance: both groups improved significantly (p=.0001) but no between group difference</p> <p>Global improvement: activities of daily living (p=.001), confidence of future self-management (p=.036) and satisfaction with treatment (p=.026) significantly improved between groups in favour of the experimental group. No difference in physical activity at 3 months</p>
Friedrich et al 2005/ 1998	<p>Disability: 13-item questionnaire</p> <p>Pain: numeric rating scale and cause of pain</p> <p>Working ability: return to work state</p> <p>BMI</p>	<p>Physical impairment: Modified Waddell Score (only at 4 months) Fingertip-to-Floor & abdominal strength (self-report at 12 months)</p> <p>Motivation: modified psychotherapy motivation questionnaire assessing level of distress, internal locus of control and attitude to exercise</p> <p>Compliance (experimental group had exercise diaries): attendance and interview</p>	<p>Baseline</p> <p>3.5 weeks</p> <p>4 months</p> <p>1 year</p> <p>5 years</p>	<p>Disability: significant difference between groups in favour of the intervention (p<.001) from 3.5 weeks and maintained at 5 years</p> <p>Pain: significant difference over time (5 years) for experimental group (p<.001) and significant difference at 5 years between groups (p=.001)</p> <p>Working ability: significant differences in experimental group at 4 months until 5 years (p=.005). Significant difference between groups at 5 years (p=.005)</p> <p>BMI: No difference at 5 years</p>	<p>Physical impairment: significant improvement at 4 months for experimental (p=.00) and control (P=.003) groups. Fingertip-to-floor: significant difference between groups at 4 months (p=.01). Significant difference in experimental (p=.002) and control (p=.034) groups at 1 year. Abdominal strength: significant difference in experimental group (p=.00) and between groups at 4 months (p=.018)</p> <p>Level of distress: significant decrease in experimental group (p=.002) at 4 months. Internal locus of control: significant decrease at 1 year in experimental (p=.001) and control (p=.012) groups. Attitude to exercise: significant decrease at 1 year in experimental group (p=.048)</p> <p>Compliance: attendance: significant difference in between groups at 1 year (p=.0005). Significant difference in weekly training frequency in favour of the intervention at 1 year (p=.036)</p>

Authors Year	Measures		Assessment time points	Results	
	Primary	Secondary		Primary	Secondary
Marcus & Stanton 1993	Session attendance	Self-report on exercise behaviour: type, frequency and duration	Baseline 9 weeks 18 weeks 2 month follow up	Attending two thirds of sessions at 9 weeks: relapse prevention group significantly greater than control ($p < .01$). Reinforcement group no difference Attending two thirds of sessions at 18 weeks : no significant difference	Self-reported exercise behaviour: no difference

Table 2.3 Outcome measures employed in the studies included

2.2.3.4 Meta-analysis: Attendance

Attendance and adherence was measured using various outcome measures. Most studies used self-reported outcome measures such as log books/exercise diaries and questionnaires (Vong et al., 2011, Silva et al., 2010, Millen and Bray, 2009, Befort et al., 2008, Basler et al., 2007, Sniehotta et al., 2005, Friedrich et al., 2005, Friedrich et al., 1998). Only one study included in the review (Silva et al., 2010) measured physical activity objectively with accelerometers and pedometers while another study (Asenlof et al., 2005) did not directly measure attendance or adherence.

Six studies reported attendance at physiotherapy sessions or exercise classes (Annesi et al., 2011, van Weert et al., 2010, Schelling et al., 2009, Befort et al., 2008, 2005, Friedrich et al., 1998, Marcus and Stanton, 1993). The subject populations of these six studies included adults with obesity (Annesi et al., 2011, Silva et al., 2010, Befort et al., 2008), sedentary women (Marcus and Stanton, 1993), patients with chronic low back pain (Friedrich et al., 1998) and cancer survivors (van Weert et al., 2010). The interventions investigated included CBT (van Weert et al., 2010, Schelling et al., 2009), MI (Befort et al., 2008), SCT (Annesi et al., 2011) and SLT (Marcus and Stanton, 1993). One study implemented their own intervention (Friedrich et al., 1998).

These six studies were pooled ($n=378$), and the results indicate that there was no significant difference in exercise attendance between the groups [REM, standardised mean difference (SMD) 0.33, 95%CI (-0.03 - 0.68), I^2 62%]. The results of the meta-analysis are presented in Figure 2.3. A sub-group analysis was completed to investigate the effects of the interventions on exercise attendance in the most repeatedly investigated patient cohort within this meta-analysis, obesity. This sub-group analysis excluded the latter three patient groups. The effect of the interventions on exercise attendance amount people with obesity did not differ from the overall effect, the non-significant effect remained [REM, SMD 0.25, 95%CI (-0.43 to 0.92), I^2 80%].

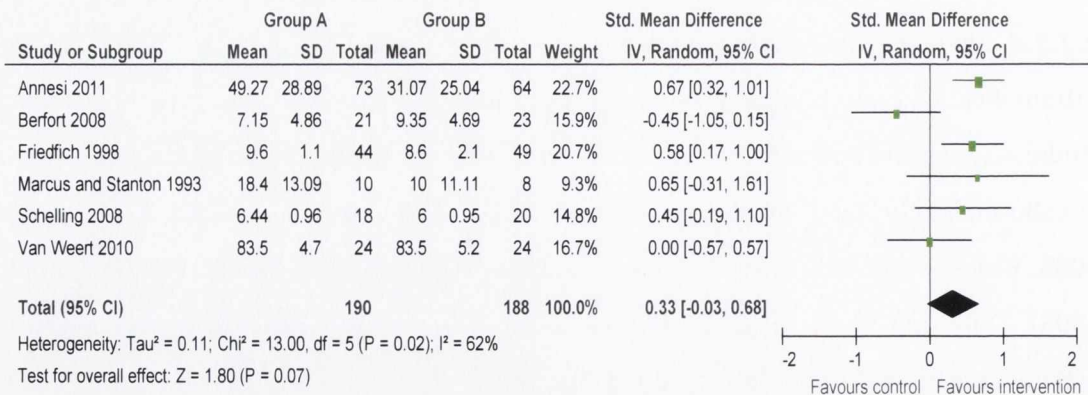


Figure 2.3 Attendance at physiotherapy sessions/exercise classes

2.2.3.5 Meta-analysis: Self-efficacy

Seven studies measured perceived self-efficacy using a variety of outcomes including the Exercise Barriers Self-efficacy Scale, Fuch’s Exercise Self-efficacy Scale and measures derived for their own study based on Bandura’s work (Annesi et al., 2011, Silva et al., 2010, Millen and Bray, 2009, Gohner and Schlicht, 2006, Befort et al., 2008, Brodie et al., 2008, Brodie and Inoue, 2005, Sniehotta et al., 2005). Six of these studies (Annesi et al., 2011, Silva et al., 2010, Millen and Bray, 2009, Gohner and Schlicht, 2006, Brodie et al., 2008, Brodie and Inoue, 2005, Sniehotta et al., 2005) were pooled (n=722). Subject populations included obese females (Silva et al., 2010, Annesi et al., 2011), cardiac patients (Millen and Bray, 2009, Brodie et al., 2008, Brodie and Inoue, 2005, Sniehotta et al., 2005) and CLBP (Gohner and Schlicht, 2006). The interventions investigated included CBT (Gohner and Schlicht, 2006), MI (Brodie et al., 2008, Brodie and Inoue, 2005), SCT (Annesi et al., 2011, Millen and Bray, 2009, Sniehotta et al., 2005) and SDT (Silva et al., 2010).

The results indicate that there was a significant difference in perceived self-efficacy between the groups following the intervention, in favour of the intervention group [FEM, SMD 0.71, 95%CI (0.55-0.87), I² 41%]. These results are presented in Figure 2.4. In order to investigate the effects of the intervention on the most frequently investigated patient population in this meta-analysis and to compare with the results of the meta-analysis a sub-group analysis of cardiac patients was conducted. This sub-group analysis also remained significant.

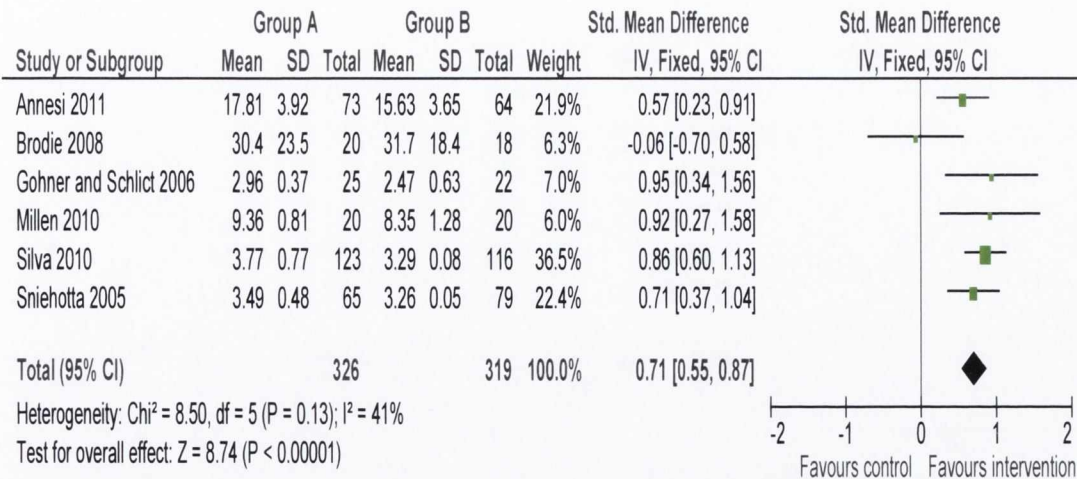


Figure 2.4 Perceived self-efficacy following the intervention

2.2.3.6 Meta-analysis: Levels of activity limitation

Six studies examined levels of activity limitation using the Roland Morris Disability Questionnaire, the Hanover Functional Disability Scale, the Pain Disability Index and the 13-item Disability Questionnaire (Vong et al., 2011, Brodie et al., 2008, Basler et al., 2007, Gohner and Schlicht, 2006, Asenlof et al., 2005, Friedrich et al., 1998). The populations investigated included CLBP (Vong et al., 2011, Gohner and Schlicht, 2006, Basler et al., 2007, Friedrich et al., 2005, Friedrich et al., 1998), chronic musculoskeletal pain (Asenlof et al., 2005) and cardiac patients (Brodie et al., 2008, Brodie and Inoue, 2005). The interventions investigated were based on CBT (Gohner and Schlicht, 2006, Asenlof et al., 2005), MI (Vong et al., 2011, Brodie et al., 2008, Brodie and Inoue, 2005), TTM (Basler et al., 2007) and their own (Friedrich et al., 2005, Friedrich et al., 1998).

The findings of these six studies were pooled ($n=550$) and there was a significant difference between the groups with respect to levels of activity limitation in favour of the intervention [REM, SMD -0.37, 95%CI (-0.65- -0.08), I^2 61%]. This is presented in Figure 2.5. This difference also persisted when CLBP studies, the most frequent patient cohort, were examined in a sub-group analysis.

It was not possible to pool other measures of impairment, activity limitation or participation restriction due to the inconsistency in reporting of outcomes between studies.

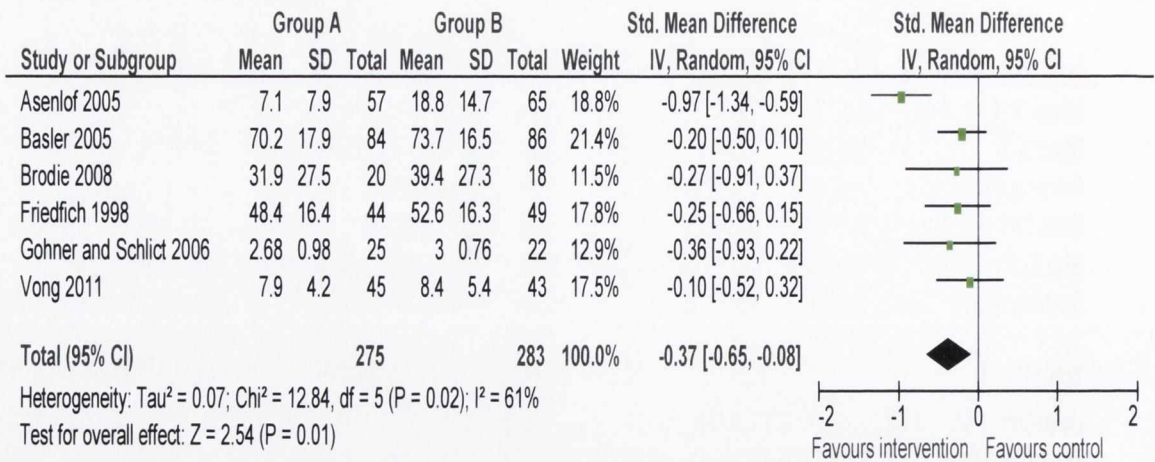


Figure 2.5 Levels of activity limitation following the intervention

2.2.3.7 Psychological theory utilised: cognitive behavioural therapy

CBT was the basis for the intervention in four of the studies included in this review, making it the most popular approach used. CBT aims to replace dysfunctional thoughts and behaviours with adaptive ones through an alliance between the practitioner and the client. An agreed upon problem is addressed by planning strategies and agreeing goals which are then put into action.

Van Weert (2010) investigated the effect of CBT on fatigue in cancer survivors (n=147). Psychologists delivered a psychotherapeutic goal-orientated approach focusing on self-management skills such as problem orientation, goal setting, recognition of barriers and solution implementation. Two experimental groups received physical training in the form of two 1-hour individual sessions with a physiotherapist and two 1-hour group sessions per week for 12 weeks. During these sessions self-efficacy and self-management principles were addressed and encouraged. The second experimental group received one 2-hour CBT session a week for 12 weeks in addition to the physical training. A third group, a control group, included people who were on waiting lists in other centres. Results of this study show that there was no significant difference between groups in attendance. Significant differences between the CBT group and the control group in levels of reported physical fatigue were reported.

Schelling (2009) studied obese adults (n=38). Two groups completed a progressive aerobic exercise class for 50 minutes once a week for 8 weeks. The experimental group

received one 90-minute motivational intervention session. This consisted of a group session offering a tailored individualised approach. The aim of this intervention was to establish solid knowledge about possible barriers to increasing physical activity and to prepare participants to deal with these barriers. This was achieved using well known cognitive behavioural strategies including guided discovery and Socratic dialogue. The control group received one 90-minute relaxation session based on the progressive muscle relaxation technique. Results showed no difference in attendance and motivational stage (by those who completed the study) but did show a significant difference in dropouts, with larger numbers reported in the control group. There was a significant difference between groups in physical activity at 6-month follow up in favour of the intervention group. A significant difference in weekly minutes spent on physical activity was reported at 6 months for the experimental group (increase) and the control group (decrease).

Göhner & Schlicht (2006) studied individuals suffering from chronic back pain (n=47). Two groups received 6 to 8 weeks of partially standardised physiotherapy sessions comprised of 10 compulsory and 12 optional exercises. The experimental group attended three 50-minute CBT training programmes. The aim of the programme was to enhance self-efficacy perceptions, reduce barrier perceptions and maximise severity perceptions. Positive feedback and interpretation of physiological status was used to improve self-efficacy. Barriers were identified by participants and plans to overcome them were discussed. Patients were given a realistic perception of severity by providing them with information about the spine in general and the development of chronic back pain. This study reported an improvement in self-efficacy while barriers reduced over time within the intervention group. There was a significant difference between groups at all time-points for these outcomes. Exercise behaviour, intention to exercise and severity of back problems also showed significant differences over time and between groups in favour of the intervention but not at all assessment points.

The final study using a CBT based intervention was Asenlof et al (2005) who investigated individuals with chronic musculoskeletal pain (n=122). Physiotherapists delivered 8-10 physiotherapy sessions over 2-3 months to both the control and experimental groups. In

addition to this the experimental group attended 8-10 intervention sessions with seven general phases. These were; 1) behavioural goal identification, 2) self-monitoring (using diaries), 3) individual functional behavioural analysis, 4) basic physical, cognitive and behavioural skill acquisition to aid in goal attainment and increase self-efficacy, 5) putting into practice the basic skills and merging motor behaviours with cognitive and problem solving skills, 6) generalisation and 7) maintenance and relapse prevention. Pain disability, pain and self-efficacy were measured. A significant difference was reported between groups in favour of the intervention with regards to pain disability, fear of movement and pain. There was an increase for global improvement for the experimental group but no differences were reported at 3-month follow up.

These studies indicate that CBT improves self-efficacy, activity limitation and exercise behaviours. Proxy measures for adherence such as attrition, physical activity, and pain also indicated that CBT had a positive effect, although it did not positively affect attendance. Studies also reported that CBT decreased barriers to exercise and decreased reported physical fatigue.

2.2.3.8 Psychological theory utilised: social cognitive theory

SCT was the basis for three studies. SCT specifies five determinates associated with changing behaviour; knowledge of risks and benefits, self-efficacy, outcome expectations, goals and plans to achieve them and facilitators and barriers to change.

Annesi et al (2011) investigated the effects of 'The Coach Approach: An Exercise Support Process', based on SCT, on exercise adherence in a population of obese females (n=137). Those in the experimental group met with a trained wellness specialist once a month for 6 months. During these meetings participants were instructed on self-management and self-regulatory skills aimed at increasing mastery and competence of exercising and overcoming barriers to exercise. At each meeting participants were instructed on a different skill; cognitive restructuring, stimulus control, disassociation for discomfort, self-reward and preparing to overcome barriers to exercise. Exercise plans were adjusted to induce favourable post-exercise feelings while goal setting and behavioural contracts were also discussed and signed. Both experimental and control groups were assigned three exercise sessions per week. The control group also met with a wellness

specialist receiving routine care which was time matched with the experimental group. The findings demonstrated that the experimental group had significantly better attendance and were significantly different from the control for each of the secondary outcome measures; physical self-concept, exercise barriers self-efficacy, mood state and body satisfaction.

Millen & Bray (2009) investigated the effect of an SCT based intervention with a population of people enrolled in cardiac rehabilitation (n=40). The intervention was self-directed and was delivered via a 30-page manual which included instructions on six upper-body strengthening exercises. The authors targeted self-efficacy through mastery experience, delivering the exercise instructions in easy to read and understand format, with clear photos of every stage of the exercise and a goal-directed progression of increasing resistance over time. Vicarious experience was targeted by including photos of same sex CR graduates. These pictures included verbal persuasion in the form of 'thought bubbles' which offered positive and encouraging statements. Physiological and affective states influence self-efficacy and the manual addressed this by including interpretations of what the participants should be feeling and information to alleviate any fears regarding resistance training. Behavioural outcomes and outcomes related to activities of daily living were also included targeting participant's outcome expectations. The control group received usual cardiac rehabilitation care. Outcomes post intervention show that there was a significant difference between groups for attendance and self-efficacy of technique in favour of the intervention. The experimental group completed significantly more exercises and sets of exercises at 4 weeks and spent significantly more days exercising at 3 months.

The third study to examine the effect of an SCT based intervention was Sniehotta et al in 2005. People with coronary heart disease (n=199) were assigned to either a control group or one of two experimental groups, a planning group and a planning plus personalised weekly diary group. The authors state that their population have strong behavioural intentions and high self-efficacy to engage in exercise but that exercise behaviour is seldom performed. This was their justification for not including much of SCT's five core determinants of HBC and focusing only on self-regulatory skills, namely

planning. The planning group received a planning booklet with two sheets, one each for action planning and coping planning. Participants would record their action plans; when, where, how and with whom they would exercise and their coping plans; how they would manage barriers to exercise. The second experimental group received the planning booklet and six weekly diaries. The diaries included copies of their own plans and participants were required to record how often the situation specified in the plan had occurred, how often they complied with the plan and how optimistic they felt about the plan for the coming weeks. The authors reported a significant difference, in favour of the intervention, for both experimental groups for both action and coping planning at 2 months but only for coping planning at 4 months. Both experimental groups were significantly different from the control at all time assessment points for behavioural intentions, while both experimental groups had significantly different self-efficacy at 4 months. The planning group had significantly more general physical activity at 2 months but there was no difference between any of the groups at 4 months. Strenuous exercise showed promising results with the planning plus diary group showing a significant difference at 2 months and both groups completing significantly more than the control group at 4 months.

These three studies indicate that SCT has a positive effect on attendance, self-efficacy and both long and short-term exercise and physical activity, although there are conflicting results regarding these last two outcomes. There were significant results in favour of the interventions for several secondary outcome measures; mood, body satisfaction and behavioural intentions.

2.2.3.9 Psychological theory utilised: motivational interviewing

MI was employed in three studies. MI is a collaborative, goal orientated communication style which aims to strengthen motivation for behaviour change by eliciting and evoking an individual's own reasons for change.

Vong et al (2011) investigated motivational enhancement therapy (MET) which integrates MI with several psychological components for people with CLBP (n=76). These components included proxy efficacy, which refers to patient's confidence in their therapist, treatment expectancy and working alliance between the patient and the

therapist. The intervention was delivered by physiotherapists who had received MET training. All subjects received ten 30-minute physiotherapy sessions in 8 weeks. Experimental group participants received MET training during the 30 minutes whereas the control group received general communication. The groups differed significantly in general health and home exercise in favour of the intervention at all follow-up time points. There was also a significant difference between groups in favour of the intervention for proxy efficacy, working alliance and treatment expectancy.

The second MI study, by Befort et al (2008) was a pilot RCT that investigated the effect of MI on obese African American women (n=34). Both experimental and control groups participated in a 16-week culturally targeted behavioural weight loss programme. The experimental group received four semi-structures MI guided interviews by trained counsellors, two of which were conducted over the phone. These interviews focused on relevant target behaviours, identified by the participants, such as barriers to exercise and problem foods. The control group received health education for the same duration. No difference between groups in attendance or adherence was reported. No difference between groups was found in physical activity, dietary intake and self-efficacy for diet and exercise.

The final MI study was Brodie et al (2008 & 2005) who investigated adults aged 65-years or older with chronic heart failure (n=60). Participants were randomised into one of three groups. The control group received standard care which consisted of the provision of information and recommendations to increase physical activity. The experimental groups both received eight 1-hour home-based sessions which focused on how to increase energy expenditure. Participants were encouraged to set their own goals and to identify barriers and methods to overcome them. One of the experimental groups received both the standard care and the motivational intervention while the other only received the motivational intervention. Both experimental groups had a significant increase in physical activity (energy expenditure) while all groups significantly increased their exercise capacity.

These three studies indicate that MI interventions increase physical activity, improve general health, improve exercise capacity and increase the frequency of home exercises. One study, a pilot, showed no effect for the intervention.

2.2.3.10 *Psychological theory utilised: self-determination theory*

For optimal development and empowerment of behaviour SDT focuses on individual's psychological needs, autonomy, competence or self-efficacy, and relatedness or empathy. Silva et al (2010) investigated the effect of a 1-year weight management programme on obese women based on SDT (n=159). The intervention took place over one year and totalled 30 weekly or bi-weekly group meetings. These meetings lasted approximately 120 minutes and were led by the intervention team comprising of six post graduate level exercise physiologists, nutritionists/dieticians and psychologists. The intervention consisted of six modules covering; 1) increasing knowledge, 2) triggering weight loss and improving diet, 3) adopting and increasing physical activity, 4) addressing barriers, promoting self-regulation and developing autonomy, 5) improving body image and 6) preparing weight maintenance. These were delivered via interactive discussion and small group activities where an autonomy-supportive environment was created. This environment came about through encouraging choice, providing a menu of options, encouraging the building and exploration of values, goals and lifestyles and by providing informational positive feedback. The control group received 29 general health education sessions. Physical activity was significantly different between groups with the intervention group taking more steps per day and spending more time in moderate to vigorous activity. There was also a significant difference in body composition in favour of the intervention group. The study reported higher levels, in favour of the intervention, for self-determination, autonomous self-regulation, internal locus of causality and motives for exercise and fitness.

2.2.3.11 *Psychological theory utilised: trans-theoretical model*

The trans-theoretical model of behaviour change assesses readiness to act on, and provides strategies to guide an individual on a new healthier behaviour. The model consists of four core constructs; stages of change, processes of change, decisional balance, and self-efficacy.

Basler et al (2007) investigated an intervention based on TTM in older adults with CLBP (n=152). Both the control and experimental groups received ten 20-minute individual standard treatment physiotherapy sessions over 5 weeks. In addition to this the experimental groups received a 10-minute counselling session prior to the start of each physiotherapy session. The counselling session was delivered by the same physiotherapist who had completed 8 hours of training. These sessions addressed readiness to change and integrated the relevant processes of change. The strategies were aimed at increasing self-efficacy, positively influencing decisional balance, enhancing the use of social support, enhancing commitment and self-reinforcement of the desired behaviour and constructively dealing with relapse control. The control group received placebo ultrasound for the same period of time. Both groups reported significant increases in physical activity and functional capacity but there were no significant differences between groups.

2.2.3.12 *Psychological theory utilised: social learning theory*

Social learning theory posits that learning is a cognitive process that takes place in a social context and can occur through direct instruction or observation of behaviour, rewards and punishments.

Marcus & Stanton (1993) studied an intervention based on SLT with sedentary females (n=120). All subjects participated in three exercise classes per week for 18 weeks. After 9 weeks there was a planned relapse, a 10 day break. Exercises classes incorporated strength, flexibility and aerobic training. Study participants were randomised into one of three groups. The control group received no further intervention. The first of two experimental groups, named the relapse prevention group, received a 20-minute weekly intervention session for the duration of the exercise programme (18 weeks). Sessions focused on the identification of barriers to adherence to the exercise programme and to exercise and on developing effective strategies to overcome these barriers. This group also discussed expected and encountered problems and strategies to deal with them in relation to the planned relapse. The second experimental group received reinforcement which took the form of six scheduled awards to the participants who had attended the greatest number of sessions in the previous 3 weeks. Participants of this group who

attended every session during the week received a lottery ticket and there were two draws, at 9 and 18 weeks. The relapse prevention group had significantly greater attendance than the control group (attending two thirds of sessions) at 9 weeks. There was no difference between both intervention groups and the control group at 18 weeks. Self-reported exercise behaviour showed no differences.

2.2.3.13 *Psychological theory utilised: non-theory based motivational intervention*

Friedrich et al (1998 & 2005) published two articles in 1998 and 2005 investigating the effects of their own motivational intervention on CLBP (n=93). Both groups in this study received ten 25-minute individual progressive exercise sessions with a physiotherapist and were advised to exercise daily. The motivational programme was delivered to the experimental group during these ten physiotherapy sessions and consisted of the following five interventions. Clear information and extensive counselling ensured participants focused on the identification and resolution of barriers, ensured instructions were clear and enhanced their internal locus of control. Reinforcement techniques were used with positive feedback and agreed upon reward and punishment strategies. Oral agreements between participants and their therapists were reinforced in writing and this was to be posted in a prominent place in their homes. The final part of the programme was to involve participants in their own care by implementing the use of an exercise diary.

Results showed that the experimental group attended significantly more physiotherapy sessions. There was a significant difference at 12 months in weekly training frequency in favour of the intervention. There was also a significant difference in favour of the intervention with regards to pain and working ability 5 years post intervention and a significant difference within the experimental group from 4 months to 5 years. There was a significant difference between groups in favour of the intervention in disability from 3.5 weeks to 5 years. Physical impairment was measured with fingertip-to-floor distance and abdominal strength and there was a significant difference between groups in favour of the intervention at 4 months although this was not maintained at 12 months.

2.2.4 Discussion

2.2.4.1 Statement of principle findings

The results of this systematic review and meta-analysis indicate that motivational interventions are successful in increasing adherence and physical activity among individuals with a variety of conditions. The meta-analysis demonstrates a significant difference in perceived self-efficacy and levels of activity limitation in favour of the intervention groups. However, due to the heterogeneity in the different approaches applied, it was not possible to complete a sub-group analysis to determine the most effective method. Differences in adherence and attendance approached significance. Of the six studies included in the meta-analysis only two had significant differences in attendance. The other four studies had significant results in other outcome measures. The review of each of the psychological theories utilised indicates that CBT, SCT, MI, SDT, SLT and the intervention utilized by Friedrich et al (1998 & 2005) all have a positive effects on physical activity, self-efficacy, activity limitations, and other proxy measures for adherence.

2.2.4.2 Adherence

The results of the meta-analysis indicate that motivational interventions have positive effects on self-efficacy and activity limitation but not attendance. The method of assessing adherence is complex and this is evident from the array of outcome measures used by the studies in this review. Due to this complexity all measures of adherence were included. The most obvious proxy measure, attendance, is dissimilar to adherence. Assessing attendance to exercise classes and physiotherapy sessions is important for positive outcomes and to decrease cancelled and missed appointments, however the authors of these studies can only hypothesize that their intervention influences adherence and physical activity behaviour. The six studies (van Weert et al., 2010, Sniehotta et al., 2005, Schelling et al., 2009, Marcus and Stanton, 1993, Friedrich et al., 1998, Friedrich et al., 2005, Befort et al., 2008) that chose to assess in this manner also assessed physical activity behaviour with self-report and other outcomes that could be used as proxy measures of physical activity. Of the six studies that measured session attendance, only Befort et al (2008) reported no difference between groups in other

outcomes. This pilot study with African-American women involved a select population and assessed cultural adaptations to MI.

An alternative method of assessing exercise adherence and physical activity was the use of log books, activity diaries, physical activity recall interviews and questionnaires. These methods of data collection are popular in the literature but are vulnerable to different types of bias including recall, reporting, regression dilution, extreme response and attention bias (also known as the Hawthorn effect) (Cook, 2010). Two types of clinician-centric biases are also prevalent, observer expectation and interviewer bias (Cook, 2010). Sliva et al (2010) was the only study included in this review to use both self-reported (physical activity recall interview) and objective measures (accelerometer and pedometer), reporting positive results from both.

2.2.4.3 Length of interventions and assessment time points

There was great variation in the length of the interventions in the included studies. The longest was 52 weeks (Silva et al., 2010) and the shortest 3.5 weeks (Friedrich et al., 1998, Friedrich et al., 2005). The remainder varied from 4 to 24 weeks. The two studies included (Befort et al., 2008, Basler et al., 2007) with no significant difference between groups lasted 7 and 16 weeks respectively. It is therefore difficult to draw a conclusion on the ideal length of an intervention as both the longest and the shortest interventions reported positive results.

The aim of this review was to examine both short and long-term changes. The time points for assessments are therefore of interest. Friedrich et al (2005), the study with the shortest intervention, reported positive results 5 years after the completion of their intervention. The remaining studies did not exceed a year in their follow-up but still reported positive results. Some studies (van Weert et al., 2010, Silva et al., 2010, Befort et al., 2008) only assessed subjects at the end of the intervention. It is therefore impossible to gauge whether the results of these three studies were sustainable past the completion of the intervention.

2.2.4.4 *Intervention delivery*

The delivery, by whom, and when, is of interest and varied across the included studies. Physiotherapists were the interventionists in four studies (Vong et al., 2011, Friedrich et al., 1998, Friedrich et al., 2005, Basler et al., 2007, Asenlof et al., 2005) with the remaining studies being either self-administered (booklet or manual), delivered by psychologists, other health care professionals or trained wellness specialists. When physiotherapists delivered the intervention they received training and delivered it during their routine sessions. Training physiotherapists to incorporate an intervention into their routine physiotherapy session would be the most practical method of delivery. This would eliminate the need for additional appointments with another professional and would increase the effectiveness of physiotherapy. The provision of a booklet or manual is also a viable option as Millen & Bray (2009) and Sniehotta et al (2005) reported in their studies in cardiac rehabilitation populations.

2.2.4.5 *Strengths and weakness of the review*

This is the first systematic review with meta-analysis on this topic. An extensive search strategy and multiple databases were used, including psychology databases, in an attempt to identify all relevant articles. It is possible, however, that articles were missed. The methodological quality of the included studies were assessed by two reviewers using valid methods, and while most were of medium quality, four studies were deemed to be of low methodological quality. Issues with blinding resulted in poor methodological quality scores. These studies were included to provide a sense of the totality of evidence. These limitations may however reduce the confidence in the review conclusions.

Due to the paucity of studies on this topic the inclusion criteria were wide and captured a variety of study populations, settings and delivery methods. As a result, data was pooled from a wide assortment of different populations and settings. This is both a strength, as it enhances the generalisability of the findings, and a weakness as it increases the assortment of study characteristics.

The variety of the included studies had an effect on the meta-analyses and must be considered when interpreting the results. When incorporating a group of studies in a

meta-analysis there is an assumption that the studies have enough in common that it makes sense to synthesize the results (Deeks, 2001). Only six studies had enough in common to allow them to be pooled for each of the three different meta-analyses. Although only six studies are pooled each time, all fourteen are included in at least one analysis. Four studies appear in more than one meta-analysis (Gohner and Schlicht, 2006, Friedrich et al., 1998, Brodie et al., 2008, Annesi et al., 2011).

Due to the variety in the included studies a test for statistical heterogeneity was carried out for each of the three meta-analyses. The I^2 statistic with a cut off of $I^2 \leq 50\%$, where the fixed-effects model was applied below this point, was used. When $I^2 > 50\%$, the random-effects model was applied. Statistical heterogeneity may be caused by clinical diversity between studies, by methodological differences or by unknown characteristics. The statistical heterogeneity present in the three meta-analyses is a result of a combination of all three. There are clinical differences between the studies, as described in the narrative review, and there are methodological differences, as described by the methodological assessments. As a result of the heterogeneity tests a fixed-effect model could only be used in one of the analyses, self-efficacy. A random-effects model was used for the remaining two meta-analyses and implies that the studies in these analyses were drawn from a population that differ from each other in ways that could impact on the treatment effect. A further estimate of the between study variance in the random-effects meta-analyses is given as Tau^2 . A result of $\text{Tau}^2 > 1$ suggests the presence of a substantial statistical heterogeneity which would seriously undermine any results. This was not the case in the results for the two random-effects meta-analyses (Figure 2.3 and 2.5).

2.3 Part B: Exploration of psychological theories

Four of the theories investigated in the above review, SDT, CBT, SCT and MI, have been shown to have a positive influence on exercise behaviour, self-efficacy and activity limitations. A further understanding of these theories is necessary as they are not part of traditional physiotherapy education or practice (O'Donoghue et al., 2014, Bodner et al., 2013, O'Donoghue et al., 2012, O'Donoghue et al., 2011). Part B of this chapter will explore these four psychological theories.

2.3.1 Aims and objectives

The overall aim of Part B is to explore the four most successful and most popular psychological theories investigated in the systematic review in Part A. The objectives of Part B are as follows:

- To explore the origins of cognitive behavioural therapy (CBT), motivational interviewing (MI), social cognitive theory (SCT) and self-determination theory (SDT).
- To explore the theoretical models of CBT, MI, SCT and SDT.
- To discuss how physiotherapists can integrate CBT, MI, SCT and SDT into clinical practice.

2.3.2 Self-determination theory

2.3.2.1 Origins

Self-determination is defined by Webster's Dictionary as the act or power of making up one's own mind about what to think or do, without outside influence or compulsion. SDT is a theory of general human motivation and has been applied to many domains such as health, education, work and sport (Ng et al., 2012). The theory emerged from psychological need theories (DiClemente et al., 2009) and the development of cognitive theories (Deci and Ryan, 2000). SDT understands goal orientated behaviour but maintains that goals cannot be achieved without addressing the needs that give goals their psychological potency (Deci and Ryan, 2000). According to Ryan and Deci SDT is the

concept of autonomous self-regulation comprising of both intrinsic and well-internalised extrinsic motivation (Ryan and Deci, 2000a). Intrinsic motivation exists when an individual participates in an activity for enjoyment and fulfilment, doing the activity for the inherent satisfaction of the activity itself; there is no external reward (extrinsic motivation). It is widely accepted that human beings are intrinsically motivated, however it appears that intrinsic motivation is prevalent only under certain conditions and in particular circumstances. In terms of maintenance of health, SDT is focused on the process by which an individual initiates a new health related behaviour and maintains it over time (Ryan et al., 2008). SDT focuses on the environmental and social supports that when present facilitate and enhance intrinsic motivation.

2.3.2.2 Theoretical model

Self-determination is grounded in a humanistic perspective and is based on the premise that humans have an innate tendency towards growth, integration and health (DiClemente et al., 2009). The theory posits that human beings have psychological needs, that if supported result in optimal development and empowerment of behaviour (DiClemente et al., 2009). SDT focuses primarily on an individual's psychological needs, namely; autonomy, competence, and relatedness. Autonomous behaviour refers to acting with a sense of volition and willingness. When individuals are autonomously motivated they are interested and invested in what they are doing. Deci and Ryan maintain that autonomy in relation to health care means encouraging individuals to make choices about how to behave, providing them with the information they need, and respecting the choices they make (Deci and Ryan, 2012). Competence is the degree to which people feel able, and have the confidence to achieve their desired outcomes (Deci and Ryan, 2012). Creating a sense of autonomy and competence are essential for the internalization and integration of behavioural change. Individuals are more likely to adopt changes if they have a sense of being respected, understood and cared for, something SDT terms relatedness. This will enable the development of trust and connection which will allow internalization to occur (Ryan et al., 2008).

SDT presents itself through two sub-components, organismic integration theory and cognitive evaluation theory. Organismic integration theory details different forms of

extrinsic and intrinsic motivation and the contextual factors that have an effect on internalization, integration and regulation of these behaviours (Ryan and Deci, 2000b). SDT suggests that maintenance of self-determined motivation depends, in part, on social and contextual factors which can facilitate or undermine intrinsic motivation. Cognitive evaluation theory suggests that the level of intrinsic motivation experienced is dependent on whether the social environment supports the individual's needs for autonomy and competence (Lonsdale et al., 2009). For example, in the presence of a physiotherapist, adherence may be high. In the absence of a physiotherapist, however, adherence of non self-determined individuals will decrease. Cognitive evaluation theory provides a platform from which to consider the relationship between physical activity and the environment in which it is being delivered. Social environments or specific factors within social environments that are referred to as autonomy supportive have been found to promote autonomous self-regulation both by helping people maintain intrinsic motivations and facilitating internalization of extrinsic motivation (Deci and Ryan, 2012).

2.3.2.3 Use by physiotherapists

SDT suggests that autonomy support from others is important in motivating change of various health behaviours (Williams et al., 2006). This is an important consideration for physiotherapists who are frequently concerned with modifying individuals' lifestyle choices. In SDT there is an emphasis on not attempting to control individuals, but respecting their frame of reference and facilitating them to engage in their own care (Deci and Ryan, 2012). SDT advocates the provision of relevant information to individuals to use in making their own informed choices. By facilitating individuals to be more knowledgeable, physiotherapists can enhance understanding and hence increase the possibility that the individual will persevere with lifestyle changes that they themselves have determined, as opposed to changes that have been imposed. Imposing changes is described by organismic integration theory as external regulation, the least autonomous form of extrinsic motivation and has an external locus of causality (Ryan and Deci, 2000b).

Increasing physical activity or changing a health behaviour may not be an intrinsically enjoyable activity, however if an individual understands and values the benefits of physical activity or changing their behaviour after discussing it with their physiotherapist, their motivation to participate in physical activity or change the targeted behaviour will increase. In time, an individual may find an activity that they enjoy and gain an inherent satisfaction from. This is termed intrinsic regulation and is a form of intrinsic motivation, according to the organismic integration theory (Ryan and Deci, 2000b). Not all individuals will find something they enjoy and may be extrinsically motivated. Integrated regulation, with an internal locus of causality, is the most autonomous form of extrinsic motivation (Ryan and Deci, 2000b). It implies that the individual has fully assimilated the identified values and needs. This is very similar to intrinsic regulation but remains extrinsic as the individual is not participating out of sheer enjoyment but to obtain a separate outcome. With the extrinsic support of a physiotherapist individuals can embrace change on a voluntary basis, while developing the confidence to change. Autonomy support from health care professionals such as physiotherapists has been shown to facilitate the internalization of autonomy and competence (Williams et al., 2006). The expertise, together with the respectful caring approach that physiotherapists bring to the practitioner-patient relationship, increases experiences of connection and trust, thereby facilitating the internalization of change, known as relatedness in SDT. Embracing this theory would offer physiotherapists the possibility of improving an individual's adherence to an exercise programme and/or HBCs by enhancing their autonomy, competency and relatedness. SDT is ideal for individuals progressing through the stages of cardiac rehabilitation, for example. Enhancing understanding, creating an autonomy supportive programme, increasing competence and relatedness could be implemented successfully to progress individuals successfully to become long-term exercisers.

In the literature it would appear that SDT is not widely used in current physiotherapy practice. A recently published study investigated the effect of SDT based communication training on physiotherapists' psychological support for patients with CLBP (Murray et al., 2015) and concluded physiotherapists who had completed the training were found to provide greater support for patients' needs (Murray et al., 2015). Despite this lack of

published research SDT has been successfully employed in other areas including, medication adherence (Williams et al., 1998), weight management (Silva et al., 2010) and substance abuse (Zeldman et al., 2004). Lonsdale et al (2009) examined the relationship between self-determined motivation and student's objectively measured PA levels. This study demonstrated that students with self-determined motivation in physical education classes achieved more PA than that of non self-determined individuals. Thøgersen-Ntoumani and Ntoumanis (2006) conducted a study examining the role of self-determined motivation in the understanding of exercise related behaviours. The results illustrated the importance of promoting self-determined motivation in exercisers to improve the quality of their experiences, as well as to foster exercise behaviour.

2.3.3 Cognitive behavioural therapy

2.3.3.1 Origins

CBT emerged from two theories of learning; classical and operant conditioning. Classical conditioning originated from the work of Pavlov and his dogs while operant conditioning was described by Thorndike's Law of Effect and was further developed by Skinner in the 1950s. Pavlov conducted experiments on dogs, ringing a bell when he served them food. When the food was served the dogs would automatically salivate. This was termed the unconditioned response to an unconditioned stimulus. Over time, with continued repetition of the sequence of events the dogs would salivate to the sound of the bell. This is a conditioned response to a conditioned stimulus. The Law of Effect states that behaviour that is followed by satisfying consequences will tend to be repeated while behaviour that is followed by unpleasant consequences will occur less frequently; defined by Skinner as positive and negative reinforcement.

During the 1970s there was a growing realization that cognitive factors had a role in learning. It was not only stimulus and the resulting behaviours, but also thoughts and perceptions, that resulted in learning. Bandura's observation/SLT described how learning by observation occurs (Bandura, 1977). If an individual observes another being successful, they will learn that it is wise to do the same. Another important feature of

Bandura's work was self-efficacy, if an individual perceives themselves capable of carrying out a behaviour, the behaviour will occur.

By the end of the 1970s new behavioural techniques had been developed and experimentally validated and behaviour therapy became the treatment of choice for many disorders such as phobias, obsessions and sexual dysfunctions. These behavioural theories and techniques were added to the cognitive theories of Aaron Beck. Beck, working on depression, had a major influence on behavioural therapy (Dowd, 2004). He introduced the idea that people can have two concurrent levels of thinking, a conscious level of thinking and an automatic level of thinking (where evaluative thoughts spontaneously arise in people's minds) (Beck, 2006). Using behavioural and cognitive techniques individuals can be helped to identify and modify their negative thoughts. This led to cognitive and behavioural techniques merging during the 1980s and 1990s to form CBT.

2.3.3.2 Theoretical model

The major goal of CBT is to replace maladaptive coping skills, thoughts, emotions and behaviours with more adaptive ones (Gatchel and Mayer, 2008). CBT is used to help individuals recognise patterns of distorted thinking and dysfunctional behaviour. A systematic discussion and carefully structured behaviour assignments are used to help individuals identify and modify their thoughts and behaviours (Whitfield and Davidson, 2007). There is an emphasis on the therapist and the client working together to form a therapeutic alliance (Whitfield and Davidson, 2007). Much of the treatment is based on the present and the main goal is to assist individuals in bringing about desired changes in their lives. The therapist and the client have an agreed upon understanding of the problem which directs and structures the therapy. This structure and direction marks CBT apart from other forms of counselling practice (Whitfield and Davidson, 2007). The goal of the agreed upon changes in the client's life is achieved by collaboration between the therapist and the individual. This is accomplished by developing skills to overcome current and future problems through planning strategies and setting agreed upon goals. In vivo, or homework, is a major part of the success of CBT as the therapy occurs in everyday life, putting into practice what has been discussed and agreed upon.

Homework allows for the testing of hypotheses which can be analysed during the next session (Whitfield and Davidson, 2007).

2.3.3.3 Use by physiotherapists

Much of CBT treatment is based on the present and therefore may be more useful to physiotherapists when an individual wants to or is actively trying to change, such as an overweight individual having changed their diet and seeking to safely increase their physical activity. The identification and recognition of current distorted thinking and dysfunctional behaviour is achieved with the help of the therapist. Physiotherapists can help individuals to recognise individual barriers, be they physical, psychological or environmental, to adherence to physiotherapy and to HBC. Lack of time or feeling embarrassed exercising in public are examples of environmental and psychological barriers and physiotherapists can assist in developing individual plans to overcome them. In conjunction with the therapist, behavioural goals are identified and plans are put in place to attain them, recognizing dysfunctional thoughts, behaviour, and personal barriers and devising plans to overcome them all. Self-efficacy plays a major role in two different ways. Firstly the individual must believe that they can complete a new exercise or set of exercises and secondly they must believe that they can complete the agreed upon behaviour change.

CBT was the basis for the intervention in four of the studies included in above review (van Weert et al., 2010, Schelling et al., 2009, Gohner and Schlicht, 2006, Asenlof et al., 2005). Physiotherapists delivered the intervention, however, in only one of these four studies (Asenlof et al., 2005). CBT was found to have a positive effect on fatigue in cancer (van Weert et al., 2010), increase PA in people with obesity (Schelling et al., 2009), increase exercise behaviour and have positive effects on self-efficacy in people with chronic back pain (Gohner and Schlicht, 2006) and significantly decreased pain in people with chronic musculoskeletal pain.

2.3.4 Social cognitive theory

2.3.4.1 Origins

SCT stemmed from work in the area of SLT conducted by Miller and Dollard in the 1940s. Identifying four key factors in learning new behaviour (drives, cues, responses and rewards), they proposed that if one were motivated to learn a particular behaviour, then that particular behaviour would be learned through clear observations. By imitating these observed actions, the observer would solidify that learned action and would be rewarded with positive reinforcement (Miller and Dollard, 1941). The proposition of SLT was expanded upon by Albert Bandura from 1962 until the present, resulting in SCT (Bandura, 1977, Bandura, 1986, Bandura, 2007).

According to SCT, people learn by observing others, with cognition, behaviour and the environment all recognised as chief factors in influencing development. These three factors are not static or independent; rather, they are all reciprocal. They mutually influence each other and either can be stronger at any given time. The reciprocal nature of these factors in SCT make it possible for therapeutic and counselling efforts to be directed at personal, environmental, or behavioural factors. Strategies for increasing wellbeing can therefore be aimed at improving emotional, cognitive, or motivational processes, increasing behavioural competencies, or altering social conditions.

Bandura's SCT stands in clear contrast to theories of human functioning that overemphasize the role that environmental factors and biological factors in the development of human behaviour, learning and adaptation. Although it acknowledges the influence of both environmental and biological factors, SCT is rooted in a view that by looking into their own conscious mind, people make sense of their own psychological processes. To predict how human behaviour is influenced by environmental and biological outcomes, it is critical to understand how the individual cognitively processes and interprets each of these.

2.3.4.2 Theoretical model

SCT promotes effective self-management of health habits that keep people healthy through their lifespan (Bandura, 2004). More specifically, the SCT framework specifies

five core determinants associated with changing behaviour, the mechanism through which they work, and the optimal ways of translating this knowledge into effective health practices.

These five core determinants are as follows; 1) knowledge of health risks and benefits, 2) perceived self-efficacy that one can exercise control over one's health habits, 3) outcome expectations about the expected costs and benefits, 4) health goals individuals set for themselves and the plans and strategies for realizing them, and 5) perceived facilitators and social and structural impediments to the changes they seek (Bandura, 2004).

Knowledge of health risks and benefits creates the precondition for change. If people lack knowledge about how their lifestyle or particular health behaviours affect their health, they have little reason to change. Beliefs of self-efficacy play a central role in personal change. An individual must believe they can produce desired effects by their actions. Otherwise they will have little incentive to change or persevere in the face of difficulties. Outcome expectations also affect HBC. What an individual expects their action to produce is important in determining behaviour change. Personal goals, both long and short-term, rooted in the individual's value system, will provide further self-incentives (Bandura, 2004).

Individual barriers and facilitators are another determinant of health habits. These are personal and form an integral part of self-efficacy and of all the thoughts that affect human functioning. At the core of SCT are self-efficacy beliefs. Self-efficacy beliefs must be measured against gradations of challenges to successful performance.

2.3.4.3 Use by physiotherapists

SCT is extremely relevant to health communication. Health care professionals have traditionally relied on persuading individuals to change through 'informational power' (sharing facts about health and illness) and 'expert power' (using professional credentials at least implicitly to impress individuals with the potential effectiveness of the prescribed behaviour change) (Elder et al., 1999) (Raven, 2008, Raven, 1965, French and Raven, 1959). SCT provides alternative ways for health education and communication. It is relevant for designing health behaviour and health education

programmes. The theory can also be used for providing the basis for intervention strategies (Jeffery, 2004, Elder et al., 1999).

Physiotherapists can employ all five core determinants of SCT associated with changing health behaviour. Educating individuals on the risk and benefits will increase their knowledge. Thorough explanations and clear demonstrations of exercises and how they should be completed will tackle self-efficacy. What an individual should physically feel and addressing how long it should take will provide the individual with the knowledge of what to expect. An individual who is learning a new rehabilitation exercise, for example, may not anticipate muscle soreness, tiredness or cramp. A thorough explanation will provide realistic outcome expectations. In assessing personal efficacy to stick to an exercise routine, people judge their efficacy in the face of different barriers; when they are under pressure from work, are tired or face foul weather for example. If there are no impediments to surmount, the behaviour will be easy to perform and everyone will be successful. Prescribing exercises and physical activity that will provide a challenge but is also achievable will also boost self-efficacy. Identification of both the individual's personal and social barriers and devising plans in conjunction with the individual to overcome them to achieve agreed upon health goals will assist in maintenance of the change.

SCT was the basis for three interventions included in the above review. These studies included obese females (Annesi et al., 2011) and cardiac populations (Sniehotta et al., 2005, Millen and Bray, 2009). These studies concluded that SCT can positively influence PA, self-efficacy, mood and body satisfaction.

2.3.5 Motivational interviewing

2.3.5.1 Origins

MI developed as a result of 'surprising' findings on the extent to which counsellor empathy explained the variance in successful behavioural change in a research study on problem drinking. Thereafter, with further reflection and discussion, William Miller described a conceptual model and clinical guidelines for MI (Miller and Rose, 2009). The definition of MI has evolved; Miller and Rollnick currently offer three levels of definition

with the layperson's definition being that 'MI is a collaborative conversation style for strengthening a person's own motivation and commitment to change' while the most technical is 'MI is a collaborative, goal-orientated style of communication with particular attention to the language of change. It is designed to strengthen personal motivation for 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, 2012).

2.3.5.2 Theoretical model

Four key aspects are embodied in the spirit of MI; partnership, acceptance, compassion and evocation (Miller and Rollnick, 2012). Partnership refers to the collaboration that exists in MI as it is not done 'to' or 'on' an individual but 'for' or 'with' an individual. The individual is the expert on themselves and it is the individual who ultimately makes decisions regarding change. Acceptance does not mean that an individual's behaviour is approved of but rather their worth as an individual is acknowledged and accepted. The concept of acceptance is rooted in the work of Carl Rogers and has four key features (Miller and Rollnick, 2012). The first of these four features, absolute worth, refers to the worth of the individual and their unique identity. When individuals are accepted as they are they are free to change, exercising their free choice and changing through a process of self-actualization (Miller and Rollnick, 2012). The second, accurate empathy, is not sympathy or identification but an understanding of the patient's frame of reference. The therapist must set aside their own judgements, preconceived ideas and expectations (Rogers, 1975). Accurate empathy allows individuals to be honest with themselves and can facilitate a true exploration of the role of health behaviours in their own life (Rogers, 1975). The third feature, autonomy, highlights the fact that an individual cannot be coerced into change and the therapist must accept their decisions regarding change. The fourth and final feature of acceptance is affirmation; acknowledging the individual's struggles, difficulties, strengths, efforts and achievements. Taken together these four features convey acceptance. That is to honour an individual's absolute worth and potential, recognise and support their autonomy to choose, seek to understand their perspective through accurate empathy, and affirm their strengths and efforts to change

(Miller and Rollnick, 2012). Compassion was added to the spirit of MI recently and does not refer to feelings such as sympathy but rather to actively promote an individual's, welfare and best interests (Miller and Rollnick, 2012). The process of change is for the individual's benefit, not the therapist's. The final aspect of the spirit of MI is evocation, which refers to the drawing out of the individual's reasons for change and their own resources to achieve it (Miller and Rollnick, 2012).

There are four processes in MI; engaging, focusing, evoking and planning. Engaging begins the process of forming a collaborative partnership. Focusing is the development of a specific direction in the conversation about change and the surfacing of goals. Evoking involves eliciting the individual's own motivations for change, not installing the therapist's reasons, and finally, planning is put in place when the individual reaches the threshold of readiness to change (Miller and Rollnick, 2012).

2.3.5.3 Use by physiotherapists

The three core communication skills; asking, listening and informing are covered in the five key communication skills used throughout MI (Rollnick et al., 2007). These five key skills are open-ended questions, affirming, reflecting, summarising and providing advice and information with permission (Miller and Rollnick, 2012).

Using MI, with an individual who would benefit from HBC, requires a physiotherapist to establish a partnership and accept the individual as who they are. Empathy and compassion about the challenges and barriers to the behaviour change the individual describes will evoke more discussion. Engaging with the individual with empathy, and acknowledging that the choice to change is theirs, will increase the likelihood of honesty from the individual. Open ended questions engage the client and evoke positives, known as 'change talk', and negatives, known as 'sustain talk', and allow for the exploration of ambivalence towards the behaviour change. Reflective listening, summarising what the client has said, and affirming their reasons for change decrease ambivalence and reduce discrepancies. Focussing on and evoking the individual's change talk and rolling with resistance to change help develop self-efficacy. Once the individual is committed to change, the therapist can assist them in making the change. This can be achieved by

evoking the individual's own plans and goals and providing advice and information, with permission from the individual.

Since the 1980's, there has been a significant amount of research carried out on the efficacy of MI in various groups of people (Lundahl et al., 2010) and the number of publications on MI has been doubling every three years (Miller and Rollnick, 2009). It has been investigated in many conditions, including alcohol, drug and gambling addictions, reducing risky behaviour and increasing healthy ones (Lundahl et al., 2010). MI formed the basis for three of the studies included in the above review (Vong et al., 2011, Befort et al., 2008, Brodie et al., 2008) and the results indicate that MI has a positive influence on PA, general health and exercise behaviour.

2.3.6 Discussion

The results of the systematic review and meta-analyses, described in Part A of this chapter, show that the four theories that emerged and were explored in Part B are successful in increasing adherence and physical activity among individuals with a variety of conditions. To gain full understanding of these theories, to become skilled in their use and to implement them into practice, education and training is necessary. These four theories, however, have a number of similarities.

Firstly autonomy is present in all four theories. The motivation to change must come from the individual; it must be their autonomous decision. One cannot force another to change; only information on why change is necessary can be provided. External pressure, information power and expert power will not foster long-term change. Physiotherapists can evoke reasons for change and challenge an individual's ambivalence but it must be the individual weighing up their own pros and cons and reaching their own decision for any change to be sustainable in the long-term. Physiotherapists are experts and can educate on the health risks of behaviours but it is the individual who is the expert on themselves, it is their own individual barriers that they must overcome and it is therefore the individual who must ultimately make the decision. Any decision made regarding change must be supported to maintain the individual's autonomy.

Empathy, known as relatedness in SDT, also features in all four theories. An accepting and trusting relationship where the individual feels cared for should be created. This facilitates frank and open discussion where personal barriers to change and dysfunctional thoughts and behaviours can be identified and discussed. An attempt must be made to empathise with each individual's situation and the personal challenges they face. Empathy is not being sympathetic with the individual or identifying with their situation but rather developing an understanding of their frame of reference. Empathising will foster autonomy and contribute to an increase in the individual's self-efficacy for change. Open ended questions, reflective listening and summarising are useful tools that can be used to create empathy, trust and open discussion.

Bandura's self-efficacy is evident in all four theories, known as competence in SDT. An individual must have the belief that they have the power to produce the desired effect before they will attempt it. If the individual does not believe that they can change their behaviour, even something as simple as executing an exercise, then no attempt will be made. Self-efficacy must be nurtured by building on success. Change or exercises that are challenging but most importantly achievable are therefore most beneficial to the patient. Providing individuals with realistic and accurate outcome expectations will inform them as to what to expect from the change, increasing self-efficacy. An example of this would be informing an individual that delayed onset muscle soreness is perfectly normal and may be expected after physical activity.

Finally planning is an important part of all four theories. After the decision is made to change, planning is vital to initiate and sustain change. Autonomy, empathy and self-efficacy are all aspects to consider when planning. The plan can be devised together but it must be the individual's own. It must include their own personal barriers and facilitators, their own personal strategies to overcome them and their own personal goals. This will support the client's autonomy. The therapist must be empathetic when assisting the client to devise plans to overcome their barriers and devise goals whilst also ensuring that the plan is challenging and achievable, supporting and enhancing self-efficacy.

The stages of change model is an important concept that requires consideration by physiotherapists when practicing any of the above theories. According to this model individual's progress through five stages of change when adopting a new behaviour or changing behaviour. These five stages begin with pre-contemplation, when the individual is not ready for change. Stage 2, contemplation, is when the individual is getting ready. Stage 3, preparation, is when the individual intends to take action. Stage 4, action, when the individual has taken steps to modify their behaviour. The fifth stage, maintenance, is the long-term continuation of the new changed behaviour. Being able to recognise and have an understanding of which stage an individual is in will enable physiotherapists to target their approach to this particular stage when eliciting behaviour change.

2.4 Areas for future research

This is an emerging topic in physiotherapy with a need for further research in the area. The following questions were raised following this research and informed the subsequent stages of the PhD. These will be presented in the following chapters. There is a need for a large exploratory study gathering both qualitative and quantitative data to determine current knowledge levels among practising physiotherapists and to explore and assess current practice. There is a need to determine knowledge of the theories included in this review and of the similarities between these theories such as autonomy, empathy, self-efficacy and planning. There is a need to investigate how practising physiotherapists currently optimise adherence to prescribed exercises and recommended physical activity guidelines and how they currently elicit HBC. There is a need to determine if physiotherapists are using the theories explored in this review. This information will provide important data current practice and knowledge among the profession and will allow for the identification of best practice and any gaps in practice.

2.5 Conclusion

This review has shown that motivational interventions can help increase adherence to exercise, have a positive effect on long-term physical activity behaviour, improve self-efficacy and reduce levels of activity limitation. A single theory to follow or the length and type of intervention that is most beneficial did not emerge from the current research, despite the overall benefit of motivational interventions. Physiotherapists' role as promoters, preventers and rehabilitators ideally places them to influence health behaviours in every individual they treat. Enabling adherence to exercises, increasing physical activity and eliciting HBC must become an important part of physiotherapy practice. Gaining knowledge of how physiotherapists currently practice will identify any educational requirements necessary to fully integrate evidence-based motivational intervention into practice.

Chapter 3. Study I Current Knowledge and Practice

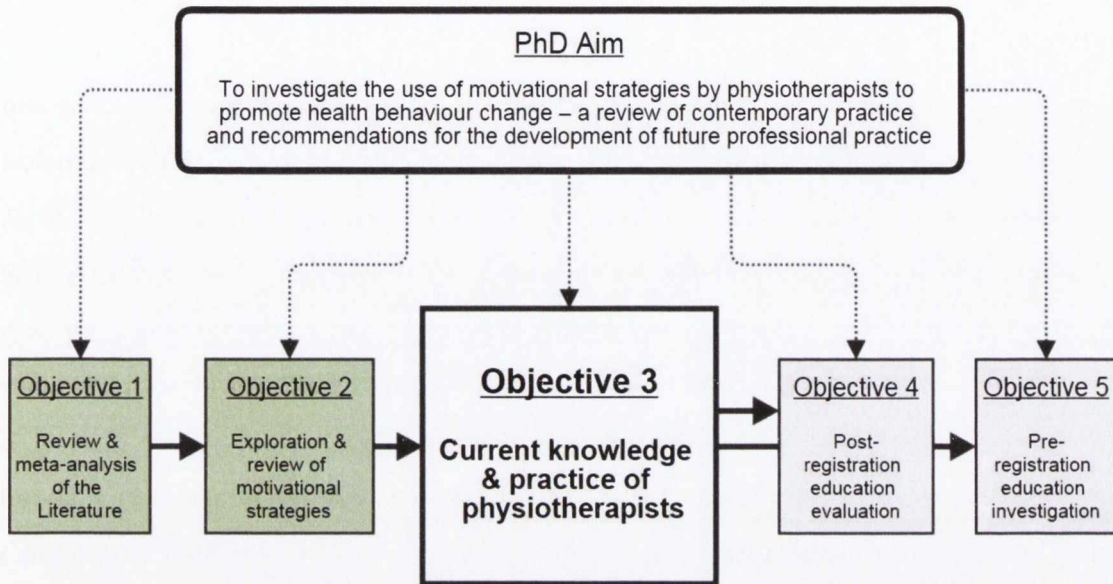


Figure 3.1 PhD flow chart

3.1 Introduction

The aims of this chapter are to outline the methodology used and to report and discuss the results of objective three, the first study in this PhD (Figure 3.1). The study investigates both the levels of knowledge among physiotherapists and the methods currently employed by members of the profession to optimise adherence and elicit health behaviour change (HBC). The findings of the literature review and meta-analysis (McGrane et al., 2015) (see Chapter 2) demonstrate that motivational interventions are an effective tool for promoting exercise adherence and increasing physical activity, and can have a significant effect on perceived self-efficacy and on levels of activity limitation. National physiotherapy associations advocate the promotion of health and disease prevention as part of physiotherapists' scope of practice (Australian Physiotherapy Association, 2008, Canadian Physiotherapy Association, 2006, American Physical Therapy Association, 2001) as does the World Confederation for Physical Therapy (World Confederation for Physical Therapy, 2011b). International guidelines recommend

the implementation of evidence-based approaches to bring about HBC (Perk et al., 2012, Artinian et al., 2010, NICE, 2007). To foster any behaviour change, whether it is health promotion or adherence to treatment, physiotherapists must be competent in evidence-based behaviour change strategies. Assessment, interventions and the skills to effect HBC need to be viewed as clinical competencies (Dean, 2009b).

Previous research into physiotherapist practice with regard to optimising adherence and eliciting HBC is limited. Several studies have investigated the use of psychological interventions by physiotherapists working in sports (Arvinen-Barrow et al., 2010, Arvinen-Barrow et al., 2007, Jevon and Johnston, 2003, Ford and Gordon, 1997). The focus of these studies was on psychological skills used to assist athletes in dealing with injuries and optimise their rehabilitation. These studies identified gaps in practice, a lack of formal training and the opinion that sports physiotherapists believe that it is necessary to use psychological strategies in their practice. Maclean et al (2002) analysed the concepts of motivation used by multi-disciplinary team (MDT) members working in a stroke unit, a third of whom were physiotherapists, and identified three techniques for influencing motivation; goals, information and accessing patient cultural norms (Maclean et al., 2002). Lequerica et al (2009) surveyed physiotherapists and occupational therapists about factors they believe impede and facilitate patient engagement with therapy. Respondents considered engagement to be an important consideration and several barriers and facilitators were identified. This sample also identified common practices used to foster engagement; setting goals, enjoyment, educating the patient, rapport, patient control and involving others.

There is no clear evidence about the extent to which physiotherapists, from all areas of practice, incorporate the successful interventions and strategies reviewed and explored in chapter 2 into practice. There is little evidence of physiotherapists' knowledge in this area. The completion of this study will allow for the identification of best practice, where it exists, gaps in practice and any educational requirements for both entry-to-practice level education and continuing professional development (CPD).

3.1.1 Aims and objectives

The overall aim of this study was to explore the views and current practice of physiotherapists in relation to motivation and HBC. The objectives of the study were as follows.

- To obtain the views of practising physiotherapists on motivation and HBC in physiotherapy.
- To identify levels of knowledge among physiotherapists on HBC and motivation interventions and strategies.
- To explore HBC and motivation methods and techniques utilised by physiotherapists at present.

3.2 Methodology

3.2.1 Personal statement

All research inherently contains some bias, and there is a potential for the researcher themselves to introduce personal bias, particularly in qualitative studies (Denzin and Lincoln, 2008). Each step of the research process, from identifying a research topic to carrying out the research to its conclusion, has the potential for the introduction of bias (Berg and Smith, 1988). It is important therefore to identify and monitor personal bias prior to beginning any research, to limit any potential bias (Denzin and Lincoln, 2008). By being aware of one's bias and taking a neutral stance during the conduction of the research it may be possible to limit potential bias, this however may not be possible (Bourgeault et al., 2010). It has been argued, on the other hand, that a researcher's background, experiences and identity can be valuable assets that can be used as sources of insight, hypotheses and validity checks (Bickman and Rog, 2008).

The background of the author (NMG) may have introduced potential bias to the research conducted in this and subsequent studies. The author is a physiotherapist who has also studied psychology. The completion of a psychology degree provided additional insight on the research topic and provided the author with the ability and expertise to

complete the project. The clinical experiences and training of the author may have caused assumptions about physiotherapy practice to be formed. The author's experiences as a student physiotherapist may have led to assumptions regarding clinical and academic education within the profession. The author may also have desired to portray the profession in a positive light.

To minimise the impact of these personal biases, steps were put in place during the design, the completion and the analysis of the following and subsequent studies. Interviewer bias, where the interviewer unintentionally gives cues that influence subjects into giving answers skewed towards the interviewer's own opinions, is an inherent risk with qualitative research methodology. Focus groups, rather than individual interviews, were used when appropriate to limit the influence of the researcher on data collection. Interview schedules were created and questions were based on previous research and on the study objectives. Member checking and respondent validation took place providing participants with the opportunity to comment on the accuracy of the data. The coding system, the code book and the codes applied to qualitative data were peer reviewed. The inter- and intra-rater reliability of the coding system was calculated. The entire project was supervised by two experienced and respected researchers. These steps are discussed throughout the project in more detail.

3.2.2 Rationale for choice of research methodology

3.2.2.1 Mixed methodology

Research methodologies, broadly, are either quantitative or qualitative, the former being a numbers-based and the latter a words-based approach (Creswell and Tashakkori, 2007). Qualitative methods provide an insight into participants' perceptions of the topic and allow participants to respond in their own language. Qualitative methods can elicit information that cannot be obtained by quantitative methods (Tashakkori and Teddlie, 2010). Research into adherence and motivation is very much a study of human behaviour and as such a qualitative aspect to any investigation of it is crucial. Despite these positive aspects, qualitative methods can often be hampered by

small numbers and can lack a wide span of information. This is less likely to be the case with quantitative methods. Realising the objectives of this study requires more than simple number gathering by quantitative methods or the gathering of opinions by qualitative methods. It requires that data be gathered which may provide insight into physiotherapists' views on motivation and HBC and how physiotherapists within the profession currently optimise adherence and elicit HBC.

The combined use of both of these data-gathering techniques, mixed methodology, is frequently used in clinical research to improve the analytical power and to expand the scope of the research question and is growing in popularity (Dein and Bhui, 2013, Borkan, 2004, Sandelowski, 2000a). The central premise of mixed methodology is that the use of both methods provides a better understanding of the research question than either method could alone (Creswell and Clark, 2011). The use of mixed methods allows for both the exploration and identification of new and missing categories and the subsequent testing of their relevance. Using both methods adds to the rigor of the data collected as they act as partial correctives to one another (Foss and Ellefsen, 2002). The use of both methods of data gathering allows for the triangulation of the data collected as information from one method can be crosschecked with the other (Tashakkori and Teddlie, 2010).

Mixed methodology involves the collection of both qualitative and quantitative data in a single study either concurrently or sequentially (Tashakkori and Teddlie, 2010). It may therefore be conducted in several different ways (Tashakkori and Teddlie, 2010). The method chosen depends on the research question and what role each aspect, quantitative and qualitative, is expected to fulfil (Tashakkori and Teddlie, 2010). The method to best achieve the objectives of this study is an exploratory sequential approach, with a qualitative stage followed by a quantitative stage (Creswell and Clark, 2011). With this method the second part of the study is informed by the first. The rationale behind this choice is that the qualitative method allows for an in-depth exploration of the topic producing a rich dataset of information covering motivation and HBC. This in turn guided the development and informed the content of the quantitative

element which examines the topic in a larger sample of physiotherapists and quantifies and confirms the qualitative data.

To comprehensively investigate and get a true reflection of practice, a large sample was required. A cross-sectional survey was chosen as the best method to achieve this and it is a method frequently used to investigate practice (Connell et al., 2014, O'Donoghue et al., 2014, McMahan and Connolly, 2013, Shaw et al., 2010, Chipchase et al., 2009, Wajon and Ada, 2003). No surveys have previously been published in the health professional literature investigating these issues. A survey had to be specifically created for this study. In order to create a survey to adequately cover the topic, however, greater insight into the area was required. To achieve this insight focus groups were conducted.

3.2.2.2 Qualitative study - Focus groups

To complete the qualitative portion of this study, focus group methodology was chosen. The justification for this approach is that focus groups are useful in exploring peoples' knowledge and experiences and capitalises on communication between participants (Kitzinger, 1995). Focus groups have been advocated as a method for studying practitioners' decision-making processes (Sim and Snell, 1996) and have previously been used to investigate physiotherapists' practice and experiences (Hayes et al., 2014, Dannapfel et al., 2013, Pashley et al., 2010, Galvin et al., 2009b, Galvin et al., 2009a). They provide a safe and comfortable environment for participants to talk with others who share similar circumstances and where participants are not singled out to answer questions (Milne and Oberle, 2005, Weinberger et al., 1998). The group dynamics of focus groups facilitate the participants' discussions and reflections as they listen to one another's opinions. They also allow participants the opportunity to contribute their perceptions without pressure to reach a consensus. Focus groups enable participants to voice opinions and generate new insights, ideas, experiences and perspectives that might not arise in individual interviews or may not have been previously considered by the researchers (Hollis et al., 2002, Kitzinger and Barbour, 1999). Focus groups were chosen as they allow the participants to discuss the topic and for the conversation to develop independently of the researcher, therefore minimising any potential researcher bias.

3.2.2.3 Quantitative study – Online survey

To complete the quantitative portion of this study, an online survey was chosen as the most appropriate method to quantify and confirm the results of the first stage. The use of an online survey is justified based on the survey topic, respondents, maintaining anonymity, recruitment method and cost. Online surveys provide the researcher with complete control over respondent selection and data gathering. Specific respondents can be targeted and a response rate easily calculated (de Leeuw et al., 2012). The ease with which the survey is completed, the sequence in which questions are read and answered, mandatory questions and preventing respondents from reading ahead is ensured (de Leeuw et al., 2012). The cost is low and controlled (Wyatt, 2000). Online surveys can be created in a way that ensures respondent anonymity. They are appropriate when the targeted population is well represented on the internet and for covering a wide geographical area (de Leeuw et al., 2012). The validity of online surveys has been checked in several studies, with data obtained online comparable to data obtained by classical methods (Eysenbach and Wyatt, 2002).

There are three basic ways that focus groups contribute to the creation of survey items: (a) by capturing all the domains that need to be measured in the survey, (b) by determining the dimensions that make up each of these domains and (c) by providing item wordings that effectively convey the researcher's intent to the survey respondent (Morgan, 1997). These three aspects of focus group research correspond to the potential for reducing different kinds of errors. First, locating the necessary domains reduces specification error. Second, generating items that appropriately cover domains can reduce invalidity both by ensuring that the content of the questions fully covers the content of the domain and by making sure that the questions mean the same thing to the respondents as they do to the researcher. Finally, identifying language appropriate for the target respondents not only improves validity but also reduces unreliability by minimising differences in how respondents interpret the questions (Morgan, 1997).

3.2.3 Focus group study procedure

3.2.3.1 Ethical approval

Ethical approval for the qualitative focus groups was granted by the Faculty of Health Sciences Research Committee, Trinity College Dublin (Appendix 4).

3.2.3.2 Qualitative descriptive design

Following advice from an experienced qualitative researcher (DC) a qualitative descriptive approach was chosen for this study. This is a descriptive study where first-hand knowledge of physiotherapists' experiences is sought. The goal was not to generate any theory, as in other qualitative approaches (e.g., grounded theory), but, rather, to identify and describe physiotherapists' views and practice. Qualitative descriptive studies focus on generating a comprehensive summary of events and practice and are useful in providing a rich description of experiences among healthcare professionals (Sandelowski, 2010, Sandelowski, 2000b). A qualitative descriptive approach has been used in the investigation of physiotherapy practice in the past (Hayes et al., 2014, Stretton et al., 2013, Pashley et al., 2010). It is the method of choice when straightforward description is the study goal; therefore it is the ideal approach for this study.

The pertinent features underlying the qualitative descriptive approach guided the design, analysis and reporting of this study. They are purposive sampling, semi-structured interview schedule with open ended questions, content data-analysis and descriptive results close to the data-set (Neergaard et al., 2009, Sandelowski, 2000b).

3.2.3.3 Sample identification

A method of combination purposeful sampling was chosen for this study (Creswell, 2012, Tashakkori and Teddlie, 2010). This entailed a combination of criterion and maximum variation sampling. Participants were selected based on knowledge of the population and their understanding of the central phenomenon of the study (Creswell, 2012). This is in line with the qualitative descriptive design where participants with known and common characteristics are purposely recruited. It also enhances the rigor of the study (Milne and Oberle, 2005). Criterion sampling was used as perspectives were

sought from each of the core clinical areas of the profession, musculoskeletal/orthopaedics, neurology and cardio-respiratory (World Confederation for Physical Therapy, 2011b). All physiotherapists receive training in these core areas and the majority of the profession practice in these clinical areas. This method of recruitment was done to ensure a full investigation of views and knowledge of motivation and HBC and to fully explore how the profession currently practices in this area. Hospital, primary care and private practice physiotherapists were purposely recruited to obtain views from different workplace environments. It is in these three workplace settings that the majority of physiotherapists work. Maximum variation was used with regards to years of experience, as is recommended in qualitative descriptive studies (Neergaard et al., 2009). Both novice and experienced physiotherapists were included in order to obtain data from perspectives of differing levels of experience and spanning an evolving entry-to-practice physiotherapy curriculum.

3.2.3.4 Participant recruitment

Physiotherapists from each of the core clinical areas of the profession, musculoskeletal/orthopaedics, neurology/gerontology, cardio-respiratory, and physiotherapists working in the primary care setting were recruited through the use of gatekeepers. To achieve this fifteen Dublin hospitals and nine clinical interested groups and one employment group of the Irish Society of Physiotherapists (ISCP) were contacted. The fifteen hospitals included large teaching hospitals, acute public and private hospitals, rehabilitations hospitals and a hospice. These hospitals were chosen as they cover both the public and private sectors, include physiotherapists involved in the education of students, include physiotherapists working in the core clinical areas of the profession, include physiotherapists treating acute and chronic conditions and include both novice and experienced physiotherapists. Dublin hospitals were chosen for recruitment as the focus groups took place in Dublin. The nine clinical interest groups included Chartered Physiotherapists in Cardiac Services, Chartered Physiotherapists in Respiratory Care, Chartered Physiotherapists in Rheumatology, Chartered Physiotherapists in Musculoskeletal Therapy, Chartered Physiotherapists in Sports and Exercise Medicine, Chartered Physiotherapists in Neurology and Gerontology, Chartered

Physiotherapists in Oncology & Palliative care, Chartered Physiotherapists in Orthopaedics, and the employment group, the Chartered Physiotherapists in Community Care. These ten groups were selected as they cover the core areas of physiotherapy practice and physiotherapists working in primary care. The inclusion of the ISCP interest and employment groups provided physiotherapists not working in Dublin the opportunity to participate.

Participants working in the same area were grouped together in their area of expertise for two reasons. Firstly to reduce differences in perspectives, which may either reduce comfort level in the discussion or affect how clearly perspectives get discussed, and secondly to capitalise on participants' shared experiences (Morgan, 1997, Kitzinger, 1995). Novice and expert physiotherapists were included in each group to obtain perspectives of differing levels of experience and from different educational backgrounds.

Recruitment began in September 2013 through the use of gate-keepers. A letter of invitation, including the participant information leaflet (Appendix 5 and 6), was sent to physiotherapy managers of the fifteen Dublin hospitals and to the Communications Officers of the nine clinical interest groups and the employment groups of the (ISCP). Each manager and Communication Officer, acting as gate-keeper, was asked to forward the letter to all relevant staff and clinical interest/employment group members. Physiotherapists interested in taking part were asked to contact NMG for further information about the study procedure. The study participant information leaflet was sent to those who contacted NMG. Arrangements were made for attendance at a focus group at a time and place of convenience for participants. A letter containing the time, date and location and the topics to be covered in the discussion was sent once participants agreed to participate (Appendix 7).

3.2.3.5 Focus group sizing

Groups were limited to no more than ten participants, with no less than six in each group. This range was chosen as it is large enough to generate good discussion while small enough to allow everyone to contribute (Morgan, 1997). Any larger and the group may become difficult to manage. There is the potential for participants to talk among

themselves or for participants to feel as if they do not need to contribute. Any smaller and an active discussion may be difficult to maintain and there is the potential for one or two participants to dominate the discussion. This may result in the generation of insufficient data where perspectives do not get thoroughly discussed, and new ideas, insights and experiences may be missed. As a result, the data generated would be similar to that of individual interviews (Morgan, 1997).

3.2.3.6 Sample size

The sample size for this study was determined partially by the sampling method but primarily by saturation of the data. Once all three clinical areas and the three workplaces were represented, the sample size was determined by saturation. Saturation is defined as the point in data collection when no new or relevant information or perspectives are emerging from the data. Hence, this is the point at which no more data needs to be collected (Given, 2008). A method of continuous data analysis was used to identify data saturation (Pope et al., 2000). Recruitment ceased once input was received from each of the core clinical areas and after saturation was reached.

3.2.3.7 Development of focus group schedule

The literature on qualitative description guided the construction of the schedule (Sandelowski, 2010, Magilvy and Thomas, 2009, Neergaard et al., 2009, Milne and Oberle, 2005, Sandelowski, 2000b). Semi-structured interviews using focus groups is the recommended format for a qualitative descriptive study (Magilvy and Thomas, 2009, Neergaard et al., 2009). Questions were designed to be simple, open-ended and flexible and were directed towards discovering the who, what, where and how of events and experiences (Sandelowski, 2000b). This allows participants to tell their own story in their own way and prevents a structure being put on answers and minimising the influence of the researcher, thus minimising researcher bias. Trust between the researcher and the participants is developed with this questioning style (Milne and Oberle, 2005). Additional questions designed to probe for more depth were included in the schedule, to be used if deemed necessary. The study objectives listed in section 3.1.1, the results of the literature review and meta-analysis (McGrane et al., 2015) and the results of the exploration of the different motivational interventions (McGrane et al., 2014) were used

to guide the development of the questions, thus minimising potential researcher bias. Potential revisions to the schedule were discussed with the focus group note taker after each focus group to account for any new information or perspectives that had arisen and required investigation. Focus groups began with introductory questions on the importance of and factors affecting motivation. They proceeded with questions on current practice and knowledge and ended with questions on education. The focus group schedule is contained in Appendix 8.

3.2.3.8 Procedural aspects of the focus groups

Six focus groups took place in November and December 2013 at times and in locations of convenience for the groups. On arrival each participant was welcomed and introduced to the moderator (NMG) and the note taker (GL) and to the other participants. Refreshments and snacks were provided prior to each session and were made available for the duration of each session. The following strategies were implemented throughout the study to ensure methodological rigor (Milne and Oberle, 2005, Krueger and Casey, 2000). Chairs were configured in a circle so that all members could see each other and name tags were provided so that each participant could refer to one another comfortably. Placed on each seat was a copy of the informed consent document and the demographic documentation (Appendix 9 and 10). The demographic document allotted study codes to each participant. Each focus group was facilitated by a moderator seated in the circle. The note taker was present, seated at the periphery of the group, observing behaviour and noting significant comments and any non-verbal communication. Once all the participants had arrived and were seated, a brief outline of the project was again provided and the focus group procedure and the roles of the moderator and the note taker were explained. Following the completion of informed consent and demographic documentation, each focus group was audio-recorded using two digital recorders. Written definitions of self-efficacy, autonomy and empathy were provided during the focus groups (Appendix 11). Definitions were provided to ensure participants understood what was being discussed.

Credibility and integrity of the qualitative study was enhanced by the implementation of the following strategies (Milne and Oberle, 2005, Hollis et al., 2002). To create a

comfortable atmosphere, the opening remarks thanked the participants, explained the study and the focus group procedure and were followed by the first question. This first question asked participants to introduce themselves and inform the group where they worked and what their typical caseload was. This was done to give each participant a chance to speak early and to let everyone know a little about each other. Participant driven data was ensured by enabling the freedom to speak. This was achieved by the moderator asking open ended questions with a flexible interview schedule while remaining in the background. This allowed participants to follow and develop their thoughts and allowed the conversation between participants to flow naturally. If one or two participants were contributing little to the conversation, questions were directed to them to allow them the opportunity to speak. To avoid the collection of superficial data, questions were posed to probe for clarification and to initiate in-depth discussion. Respondent validation, or member checking, occurred at the end of each group. Each session was concluded with the note taker summarising and paraphrasing the discussion. An opportunity to add or dispute what had been said was then provided and on occasion this led to further discussion. Following each focus group a brief discussion was held between the moderator and the note taker. Both of these procedures assisted in limiting any potential bias from the researcher. Overall impressions, significant quotes, any major ideas presented and potential revisions to the schedule were covered during this discussion. If anything of significance arose it was added to the field notes.

3.2.3.9 Confidentiality

To ensure confidentiality each participant was assigned a study code for the duration of the study according to seating arrangements. All names and any other details that could possibly identify participants were removed from the transcripts. The codes were only meaningful to the researcher (NMG) and the note taker (GL). All data was saved on limited access username and password protected computer files and all written documentation was held in secure filing cabinets in a locked office. Access to the data was limited to the researcher (NMG).

3.2.4 Focus group data analysis

3.2.4.1 Data preparation

All conversations occurring in the focus groups were recorded and accompanied by field notes capturing non-verbal communication. All recorded data was listened to once and then transcribed verbatim by the researcher (NMG). Documented field notes were read as the recording was replayed, ensuring non-verbal information was captured and added to the data. Accurate transcription was ensured by listening to the recordings while re-reading the transcripts. Any typographical errors or omissions were corrected, enhancing rigor and credibility (Milne and Oberle, 2005). All names and any other details that could identify participants were removed. Over 50,000 words of original content was transcribed.

3.2.4.2 Qualitative data analysis

Thematic content analysis, as described by Braun and Clark (2006), was used for analysis of the transcripts. This form of analysis was chosen as it is not closely aligned to any pre-existing theoretical framework. It can be a realist method, which reports experiences, meanings and the reality of participants (Braun and Clarke, 2006). An inductive approach was chosen, in which the themes are strongly linked to the data (Braun and Clarke, 2006, Pope et al., 2000). Themes were identified at the semantic level. This involves the identification of themes within their explicit or surface meanings and where analysis does not look beyond what the participant has said. No attempt is made to interpret or theorise broader meanings or implications (Braun and Clarke, 2006). An inductive semantic approach to thematic analysis is therefore the ideal analysis for a qualitative descriptive study. This process involves six phases detailed in Table 3.1. The first phase occurred during data collection and data preparation. Notes on initial ideas for themes and codes were produced during these phases, which informed the early stages of analysis (Braun and Clarke, 2006).

Initial codes were generated in the second phase. A code is a tag, most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based data and can range from a single

word to a full sentence to an entire page of text (Saldana, 2009). The use of codes helps pull together a lot of material in relation to a particular research question or theme (Miles and Huberman, 1994). This initial list of codes was based on the objectives of the study and from familiarisation with the data. During this stage the focus group transcripts underwent a process of basic content analysis and two rounds of coding. This involved reading and re-reading of the transcripts. Initially the transcripts were read in their entirety in order to get a sense of the whole. On the second reading NMG used line-by-line analysis to identify common sub-categories of code within the preliminary codes. This was the first round of coding and was completed systematically throughout the entire data-set. The first version of the codebook was devised based on this basic content analysis. The codebook outlines each code and sub-code with explanations for each. This was done to enable other researchers to independently analyse the data. On the third reading, codes were assigned to the data, forming the second round of coding. The suitability of the coding system and the first version of the codebook was checked by one of the study supervisors familiar with qualitative research who checked approximately 20% of the coded data (TC). Due to the large amount of data, a subset of 20% was chosen based on the literature (Hruschka et al., 2004). Code suitability, potential themes and definitions were discussed and clarifications proposed.

During the third phase, the different codes were sorted into potential themes and all the relevant coded extracts were collated within the identified themes. The codebook was then revised and modified. Codes and sub-codes were expanded if the codes did not adequately cover the theme, or collapsed if they were unwarranted. A second and final version of the codebook was then produced and the data re-coded with this new codebook.

In the fourth phase the themes were reviewed. The entire data-set was re-read to ascertain whether the themes were suitable for the data-set and to re-code any additional or missed data within the finalised themes. The finalised themes and sub-themes were refined, defined and named in the fifth phase. Sub-themes are essentially themes within a theme that give structure to large or complex themes (Braun and

Clarke, 2006). The final analysis occurred during the production of the results and the discussion of the findings.

Phases of thematic analysis	
1. Familiarisation with the data	Transcribing focus group data, reading and re-reading data, noting down initial ideas.
2. Generating initial codes	Systematic coding of the data across the entire data-set, collating data relevant to each code.
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes	Checking the themes work in relation to the coded extracts and the entire data-set.
5. Defining and naming themes	Generating clear definitions and names for each theme. Ongoing analysis to refine the specifics of each theme.
6. Producing the report	The final opportunity for analysis. Selection of extracts, final analysis of extracts, relating back to the research question and literature. Producing a scholarly report.

Table 3.1 Phases of thematic analysis (Braun and Clarke, 2006)

3.2.4.3 Inter-rater and intra-rater reliability of the focus groups

An investigation of inter-rater and intra-rater reliability of the coding system was carried out. To investigate the inter-rater reliability, an independent coder, previously unconnected to the study (EMG), was provided with an un-coded copy of 20% of the transcript and asked to code it using the final codebook. This figure of 20% was again acceptable based on the large amount of data and is in accordance with coding practices in the literature (Hruschka et al., 2004). All agreements and disagreements were counted to establish inter-rater reliability. Any disagreements between the initial coder (NMG) and the independent coder were discussed and resolved. The same 20% portion of the data was coded by the original researcher (NMG) with a time interval of one month between initial and subsequent coding. The results were compared to establish the intra-rater reliability. The formula presented in Table 3.2 was used to calculate the

reliability of the coding and is expressed as a percentage agreement (Miles and Huberman, 1994).

$\frac{\text{Number of agreements} \times 100}{\text{Total number of agreements} + \text{disagreements}}$

Table 3.2 Analysis of inter-rater and intra-rater reliability (Miles and Huberman, 1994)

3.2.5 Online survey study procedure

3.2.5.1 Ethical approval

Ethical approval for the quantitative online survey was granted by the Faculty of Health Sciences Research Committee, Trinity College Dublin (Appendix 12).

3.2.5.2 Development of the survey

The survey and the survey questions were devised based on several inputs including the study objectives listed in section 3.1.1, the material used to develop the focus group schedule (described in section 3.2.2.7) and the findings of the qualitative portion of the study. Themes that emerged from the qualitative data were investigated using an online survey and hence were used to inform the questions. These included factors that influence motivation, strategies employed to motivate, frustrations in motivating patients/clients and education, both at entry-to-practice level and CPD.

An introductory explanation, stating the purpose of the study and confidentiality of responses, was included at the beginning of the survey (Abramson and Abramson, 2011). To avoid inaccurate answers, several design features were included. Questions were sequenced in a natural order, ensuring irrelevant questions were bypassed. Long successions of questions that elicit identical responses were avoided and several question designs were included to prevent respondents neglecting to read the question as they expect to know the answer. General questions preceded specific ones (Abramson and Abramson, 2011). Question design included the following; open ended questions, multiple choice with and without multiple answers, Likert scale and ranking. The survey was hosted on www.surveymonkey.com, which ensured that the questionnaire, questions and the response options were visually identical for every

potential respondent no matter which web browser or device they used to open the survey (de Leeuw et al., 2012). A progress indicator was used to let respondents know how close they were to the end, discouraging them from quitting the survey (de Leeuw et al., 2012).

The survey was piloted among 10 physiotherapists previously unconnected with the study to examine question structure, sequencing and continuity of topics and questions, readability and clarity. These 10 physiotherapists were known to the author (NMG) (former classmates, colleagues and friends) and were contacted to pilot the study after previously volunteering to assist with the research in any possible way. All ten agreed to pilot the survey. They were not excluded from completing the study. This pretesting of the questions resulted in minor changes and assisted with increasing validity and practical utility of the survey (Curtis and Drennan, 2013). Minor changes included changes to the wording and phrasing of questions and to the question format of one question. The survey consisted of three sections; demographics (5 questions), current knowledge and practice (11 questions) and education (4 questions). Upon completion of the survey, respondents were invited to leave a voluntary comment. The survey is contained in Appendix 13.

3.2.5.3 Respondent recruitment

Permission was granted by the board of the ISCP to survey its members in September 2013. The ISCP acted as gate-keeper, sending the invitation email to all practising members of the ISCP. The survey was incentivised as this has been shown to be an effective method of increasing the response rate and motivating respondents to complete the entire questionnaire (de Leeuw et al., 2012). Entering the draw for the incentive was optional and waived anonymity. Contact details provided were used for the purpose of the draw exclusively. This was made clear in the email at the beginning of the survey and at the end of the survey when respondents were asked if they wanted to enter the draw. The email (Appendix 14) contained a short background to the study, the link to the survey, contact information and details of the incentive. Members of the ISCP who have specifically requested to be excluded from third party contact did not receive the invitation email.

3.2.5.4 Distribution of the survey

An invitation email was sent to 2,399 practising members of the ISCP. The email contained a link to the survey which was hosted on www.surveymonkey.com. The option of completing a paper survey was provided. The survey remained open for four weeks. A reminder email (Appendix 15) was sent by the ISCP to the same members two weeks after the original email.

3.2.6 Online survey data analysis

The completed online surveys were password protected and were accessible only to NMG and the study supervisors. The responses were downloaded into Microsoft Office Excel 2007, SPSS (Windows version 20) and QSR Nvivo 10. Descriptive statistics were used to examine respondent demographic and workplace characteristics. Open ended questions and comment boxes were analysed using thematic analysis (Braun and Clarke, 2006), word frequency counts and word searches. Word searches and frequency counts included synonyms and stemmed words. Word searches and frequency counts are used to effectively communicate the frequency of occurrence of some feature in the text and can be used to identify relationships (Miles and Huberman, 1994). Word frequencies can be indicative of the relative importance of emergent themes (Tashakkori and Teddlie, 2010).

Chi-square tests of independence were used to examine associations between variables. A Chi-square test of independence is a statistical test commonly used for testing independence between two or more observations. This test is applied to categorical data and is used to evaluate how likely it is that observed differences arose by chance. All tests were completed with a 0.05 level of significance.

3.3 Results

3.3.1 Focus group results

A total of six focus groups took place in November and December 2013. They lasted 62 minutes, 38 minutes, 54 minutes, 50 minutes, 55 minutes and 44 minutes respectively. The transcripts run to approximately 50,000 words.

3.3.1.1 Identification of saturation

All three core clinical areas were represented in the first three groups. All three workplaces settings, hospital, community and private practice, were represented in the first five groups. Saturation was reached after the fifth focus group. The definition of saturation is presented in section 3.3.6. A sixth group, comprised of physiotherapists from a range of clinical practice areas, was held to confirm saturation. No further relevant information or perspectives emerged from the analysis of this final group.

3.3.1.2 Focus group participant demographics

In total 42 physiotherapists took part in the six focus groups. The demographics of the focus group participants are contained in Table 3.3. Seventeen participants (40%) hold a post-graduate qualification while only n=13 (30%) have completed a CPD course on motivational strategies. One participant works in two settings, hospital and private practice.

Demographics	(n=42)	
Average Years Qualified	11.6	
Range Years Qualified	2-38	
Standard Deviation of Years Qualified	9.1	
Highest Qualification Achieved	n=	%
Diploma	1	2.4
Bachelor degree	24	57.1
Higher Diploma (Post-graduate)	4	9.5
Master's degree	13	31
Doctoral (DPT)	0	0
Doctoral (PhD)	0	0
Completed CPD on motivation strategies	13	30.9
Clinical area		
Musculoskeletal/Orthopaedics	15	35.7
Neurology/Gerontology	10	23.8
Respiratory	7	16.6
Paediatrics	1	2.4
Workplace settings		
Hospital	18	42.8
Primary care/Community rehabilitations/Domiciliary	9	21.4
Out-patients department	11	26.1
Private practice	5	11.9

Table 3.3 Focus group participant demographics

3.3.1.3 Inter-rater and intra-rater reliability of the focus group data

The method used to examine the reliability of the coding and the formula used to calculate the inter-rater and intra-rater reliability was described in Section 3.2.3.3. The results are presented in Table 3.4 and Table 3.5. Most discrepancies were errors of omission, where one or the other coder overlooked text that could be coded. All disagreements that were not an error of omission were resolved through discussion.

$$\begin{aligned} & \frac{\text{Number of agreements} \times 100}{\text{Total number of agreement} + \text{disagreements}} \\ & = \frac{184 \times 100}{184 + 42} \\ & = 81.4\% \end{aligned}$$

Table 3.4 Inter-rater reliability of the focus group coding system (Miles and Huberman, 1994)

$$\begin{aligned} & \frac{\text{Number of agreements} \times 100}{\text{Total number of agreement} + \text{disagreements}} \\ & = \frac{220 \times 100}{220 + 19} \\ & = 92.05\% \end{aligned}$$

Table 3.5 Intra-rater reliability of the focus group coding system (Miles and Huberman, 1994)

It is common to expect that inter-rater reliability be $\geq 70\%$ (Miles and Huberman, 1994) while others suggest it should be as high as 80% to 90% by the final round of coding (Hruschka et al., 2004). The accepted value of intra-rater reliability of the coding system is $\geq 80\%$ (Miles and Huberman, 1994). The results obtained demonstrate the reliability, both inter-rater and intra-rater, of the coding system.

3.3.1.4 Themes and sub-themes

Four themes were identified from the analysis, which was described in Section 3.2.3 of the focus group transcripts. These themes and sub-themes are presented in Table 3.6.

Themes	1. Factors influencing motivation	2. Strategies currently used to optimise adherence	3. Frustration with regards to non-adherence	4. Education
Sub-themes	<ul style="list-style-type: none"> • Health • Differences among individuals • Expectations for physiotherapy • Financial/Legal 	<ul style="list-style-type: none"> • Established methods • Coercive methods • Appropriate methods 	<ul style="list-style-type: none"> • Enjoyment • Frustrations with time • Frustrations with the multi-disciplinary team • CPD and experience 	<ul style="list-style-type: none"> • Importance • Clinical experience

Table 3.6 Themes and sub-themes generated through focus group analysis

3.3.1.5 Theme 1: Factors influencing motivation

The first theme identified in the data was ‘Factors that influence motivation’. This theme was identified in discussions regarding the reasons individuals are not motivated for physiotherapy or physical activity. This theme included four sub-themes; ‘Health’, ‘Differences among individuals’, ‘Expectations for physiotherapy’ and ‘Financial/Legal’.

The first sub-theme, ‘Health’, was discussed by all focus groups. These discussions focused on how health can influence motivation for physiotherapy and included the topics of cognitive ability, depression, disability, pain and maintaining independence.

“It’s got a lot to do with cognitive ability.” [MFG14 – In-patient neurology physiotherapist with 6 years experience]

“I think people who maybe suffer from depression... they find it very hard.” [MFG34 – Primary care physiotherapist with 37 years experience]

“Patients with less disability, quite frankly patients who are high level (are easier to

motivate)." [MFG10 – In-patient gerontology physiotherapist with 3 years experience]

"Pain and fear around pain would definitely make them more passive and very avoidant during any sort of exercise." [MFG26 – Out-patient department physiotherapist with 6 years experience]

"Particularly if they are very independent and decide they don't want to lose their independence." [MFG01 – Private practice physiotherapist with 2 years experience]

The second sub-theme was 'Differences among individuals'. Individual characteristics and the effect they have on motivation were discussed by all six focus groups. These individual differences included age, gender, personality type, friend and family support, previous levels of physical activity and level of education about or awareness of their circumstances.

"It's not that they are older or younger because some of the most difficult patients that I have come across are the young ones." [MFG19 – In-patient cardio-respiratory physiotherapist with 14 years experience]

"I sometimes find the elderly can be more compliant. So I worked in the age-related day hospital before and they're the most compliant population I've ever worked with. They all do their exercises." [MFG36 – Out-patient department physiotherapist with 4 years experience]

"Men need a little more coaxing I think, in general." [MFG27 – Primary care physiotherapist with 19 years experience]

"If the men start to come, the likelihood of them sticking it through is higher than the women." [MFG29 – Primary care physiotherapist with 15 years experience]

"There are some people who are more passive in their management and there are people who naturally take more of an active role and I think that's something that's ingrained in somebody possibly from quite an early age. Their role in their own health and I think some people see that as somebody else's problem. Other people take more responsibility for their own health and wellbeing." [MFG22 – Out-patient department

physiotherapist with 14 years experience]

“If you’ve got family you can work with and they’re really supportive then you usually have no problems selling it. But if you’ve got a person who is by themselves it can be very difficult to motivate them because they’ve nobody to help them and most of the time they probably need a little bit more assistance. I think it depends on support.” [MFG30 –

Primary care physiotherapist with 6 years experience]

“I think they’ve been engrained from an early age and it’s something I would see a lot in hospital during the rehabilitation session that people are usually very fit and active throughout their lives and then they like coming back to the gym ‘cause it’s something that they’ve always kind of bought into. So for me those patients are people who have always been active.” [MFG26 – Out-patient department physiotherapist with 6 years

experience]

“They have some level of insight or awakesness or awareness of what is going on. That they are not just passively going through things and it’s a conveyor belt thing that they are sitting on, and it means something to them... some people just plod through like, and then other people who are a bit more awake or aware, they are engaged.” [MGF19 – In-

patient cardio-respiratory physiotherapist with 14 years experience]

The third sub-theme was ‘Expectations for physiotherapy’. This sub-theme was identified in discussions regarding how the individuals understanding of what physiotherapy is and previous experience with healthcare professionals can impact on motivation for physiotherapy.

“They believe that physiotherapy can help their outcome.” [MFG21 – Out-patient department physiotherapist with 17 years experience]

“From the patient’s point of view they don’t have to be motivated to do anything ‘cause you’re going to go in and do it to them and then somehow they’ll be miraculously stronger.” [MFG35 – Primary care physiotherapist with 25 years experience]

“We are going to be magic and be able to get them to do stuff.” [MFG37 – In-patient paediatric physiotherapist with 6 years experience]

“How many interactions they’ve had with healthcare professionals in the past and how successful they’ve been.” [MFG02 – Private practice physiotherapist with 4 years experience]

The final sub-theme was ‘Financial and Legal issues’. This involved both how personal finances influence motivation and also how upcoming legal issues have an effect. This sub-theme was, however, not identified in the in-patient cardio-respiratory and neurology/gerontology focus groups.

“If they’ve had a work injury and they don’t like their job in the first place they’re not very motivated to go back to it if they’re on sick leave. Then you get some people who are in going ‘I’m only off for 2 weeks what do I need to do?’” [MFG33 – Primary care physiotherapist with 1 year experience]

“So court cases ... would be more difficult to motivate.” [MFG02 – Private practice physiotherapist with 4 years experience]

3.3.1.6 Theme 2: Strategies currently used to optimise adherence

The second theme, strategies currently used to optimise adherence and elicit HBC, included three sub-themes. The first sub-theme is the use of ‘Established methods’. The methods discussed most often included educating the patient and setting goals, which were mentioned by every group. Other established methods discussed included groups, involving family and friends and involving the MDT. The use of groups was not mentioned by the in-patient cardio-respiratory and neurology/gerontology focus groups as this work place environment makes the use of groups less feasible. Conversely it was only the two in-patient focus groups that discussed involving the MDT, which is to be expected as the hospital setting has members of the MDT working closely together.

“It’s very important to educate them and make it quite clear to them that they have to get engaged... that’s motivating people really.” [MFG03 – Out-patient department physiotherapist with 34 years experience]

“Give them specific goals to do and see if they can accomplish that next week. It gives them a target to try and achieve.” [MFG05 – Private practice physiotherapist with 4 years experience]

“I think groups help to motivate people because they can help to motivate one another.”
[MFG03 – Out-patient department physiotherapist with 34 years experience]

“The main way I motivate people would be just like talking to them, like using other family members as well.” [MFG16 – In-patient cardio-respiratory physiotherapist with 7 years experience]

“Getting nursing staff and care attendants involved as well. In terms of motivation and knowing what the patient should be doing and again motivating them outside of physio.”
[MFG13 – In-patient neurology physiotherapist with 3 years experience]

The second sub-theme identified was the use of ‘Coercive methods’. These methods included blackmail, threats, ultimatums and consequences. These methods were discussed by private practice, in-patient, out-patient and primary care physiotherapists.

“In some ways its horrendous... you actually have to blackmail people to do what is good for them.” [MGF19 – In-patient cardio-respiratory physiotherapist with 14 years experience]

“Threaten them a little bit with the medical team, potentially with their family.” [MGF19 – In-patient cardio-respiratory physiotherapist with 14 years experience]

“I find telling, giving ultimatums, saying ' if there is not improvement after 6 to 8 sessions, physiotherapy isn't necessarily going to help you... I think that can sometimes make them realise that this isn't just going to be a never ending come back and see me come back and see me, get the attention kind of thing. I think that helps to motivate sometimes as well.” [MFG04 – Private practice physiotherapist with 3 years experience]

“Do you want to go home, do you want to go to a rehab or is long-term care going to be the only option for you if you're not going to try and do your physio and get better.”
[MFG06 – In-patient orthopaedic physiotherapist with 4 years experience]

The final sub-theme identified was termed 'Appropriate methods' as it refers to strategies that are common to motivational interviewing (MI), self-determination theory (SDT), cognitive behavioural therapy (CBT) and social cognitive therapy (SCT) (McGrane et al., 2014) which have been proven to be effective (McGrane et al., 2015). Building self-efficacy and promoting autonomy was discussed by every group. Providing realistic expectations, finding enjoyment and identifying barriers made up the appropriate strategies discussed. They were not, however, discussed by the two in-patient groups.

"You have to give people self-efficacy too; you have to help people to believe that they can make a difference to themselves." [MFG03 – Out-patient department physiotherapist with 34 years experience]

"So just even getting them to say 'okay realistically I can't do it three times a day'. Putting it back on them, what do you think you can, what's reasonable for you... that can work." [MFG22 – Out-patient department physiotherapist with 14 years experience]

"If they are not actually making progress and they need a little bit of a sit down, have a chat with them say we are not seeing results yet but keep going with it, you are doing the right things." [MFG02 – Private practice physiotherapist with 4 years experience]

"It's very important to find something they enjoy. That's what's going to keep them sticking with it." [MFG01 – Private practice physiotherapist with 2 years experience]

"Directing the conversation but letting them obviously attempt to put forward the answers, whether it's about perceived barriers or whatever." [MFG21 – Out-patient department physiotherapist with 17 years experience]

3.3.1.7 Theme 3: Frustrations with regards to non-adherence

Frustration regarding non-adherence and dealing with patients perceived to be unmotivated was voiced by all groups.

"I find that the people, the patients that are de-motivated are just energy sapping for the physiotherapist, they just take all your energy away from you as I suppose you are just constantly trying to think of ways to motivate them." [MFG01 – Private practice physiotherapist with 2 years experience]

“It’s so frustrating and it is really hard not to get angry with them because you know that they can do it.” [MFG06 – In-patient orthopaedic physiotherapist with 4 years experience]

“It’s probably a vice versa thing. If the patient continues not motivated then it sometimes can nearly affect our motivation as well. It’s kind of hard then sometimes if it is a recurring thing to kind of go in everyday.” [MFG12 In-patient neurology physiotherapist with 2 years experience]

“Part of the frustration comes from the feeling that you are not being effective in your own practice.” [MFG20 – In-patient cardio-respiratory physiotherapist with 13 years experience]

Three sub-themes were identified from the data with regards to frustration. The first, ‘Enjoyment’, was evident from participants who spoke about the satisfaction they got from motivating individuals.

“There are ones that if you can make a breakthrough they are the ones that you get the most satisfaction.” [MFG02 – Private practice physiotherapist with 4 years experience]

“Having someone who is well motivated is a joy to work with.” [MGF19 – In-patient cardio-respiratory physiotherapist with 14 years experience]

“The other side of it though as well from a job satisfaction sometimes the tough nut is the one that you crack. It’s the one that gives you the job satisfaction”. [MFG22 – Out-patient department physiotherapist with 14 years experience]

The final two sub-themes with regards to frustration came from the participants working environments; ‘Frustrations with time’ and ‘Frustrations regarding working with the MDT’. Time was discussed by every group. Frustrations with the MDT were not, however, discussed by private practice physiotherapists or the out-patient group. This is expected given the limited interaction between the MDT and physiotherapists working in these settings. Frustrations with the MDT included how a lack of communication with patients from MDT members can adversely affect their motivation. Other frustrations included the impact members of the MDT can have on a patient’s motivation to

participate in physiotherapy and frustrations regarding inappropriate referrals of patients who are not prepared to participate in physiotherapy.

“You can offer it but if they are not interested you don’t often have the time to actually spend the time to get into their heads and what they are thinking and try and motivate them, you have to move onto the next patient.” [MFG18 – In-patient cardio-respiratory physiotherapist with 10 years experience]

“What’s really frustrating is when you are working towards a goal and you’re getting there and then something else happens from another team member.” [MFG08 – In-patient neurology physiotherapist with 8 years experience]

The final sub-theme within ‘Frustration’ identified was ‘CPD and experience’. There was an indication that frustration diminished and job satisfaction increased with experience or the completion of CPD in the area. This sub-theme was identified in groups involving primary care, out-patient and in-patient physiotherapists.

“As you develop experience you develop different, better ways of talking to people and different types of people and you can access different people.” [MGF19 – In-patient cardio-respiratory physiotherapist with 14 years experience]

“I definitely would have had more of a didactic approach when I was younger, I was like ‘this is whatever’ and not getting any feedback.” [MFG21 – Out-patient department physiotherapist with 17 years experience]

“Certainly in the past I would have taken it more personally if somebody didn’t want to do something. I don’t now because of that extra training.” [MFG31 – Primary care physiotherapist with 33 years experience]

3.3.1.8 Theme 4: Education

Views on the importance of education were clear from the data. All participants agreed that education on motivational interventions, in some form, should be included at entry-to-practice level, while all but three said they would attend a CPD course.

"I think it's a big thing and we don't actually know what it is." [MFG06 – In-patient orthopaedic physiotherapist with 4 years experience]

"Like if it is so fundamental, and I would really think it is very fundamental to what we do, is to get people engaged in their own health, then it should be bedded down within our own education system." [MGF19 – In-patient cardio-respiratory physiotherapist with 14 years experience]

"It would be very powerful stuff to know." [MFG20 – In-patient cardio-respiratory physiotherapist with 13 years experience]

"We need to come away from manual therapy and look at the broader holistic aspect of creating change, which is essentially what we're often trying to do." [MFG24 Out-patient department physiotherapist with 17 years experience]

The ideal time for the introduction of the interventions and strategies was debated by each group. Participants spoke of clinical experience being necessary as the experience of patients who do not engage with physiotherapy or are perceived to be unmotivated was necessary to appreciate the importance of these interventions.

"I think it would have to be at the end, having done a few placements... you would have to have some clinical experience 'cause one could just be sitting in a lecture and you won't really get what's going on until you actually physically deal with a patient who is not motivated." [MFG13 – In-patient neurology physiotherapist with 3 years experience]

"It's just hard to piece that together when you don't have patients." [MFG26 – Out-patient department physiotherapist with 6 years experience]

"Because we weren't seeing patients everyday and we wouldn't have appreciated how important it was and had the chance to practice it so it would have been very theoretical." [MFG36 – Out-patient department physiotherapist with 4 years experience]

"There is a place for it in 4th year... in final year when they've done the majority of their placements and they have an idea of what patient interaction is like." [MFG42 – Out-patient department physiotherapist with 8 years experience]

3.3.2 Online survey results

3.3.2.1 Response rate

A total of 632 physiotherapists responded to the survey with 562 completing it sufficiently to be included in the analysis. This is a response rate of approximately 26.3% which is in line with response rates published in the literature on physiotherapy professional practice (Connell et al., 2014, Chipchase et al., 2009, Wajon and Ada, 2003) and is higher than a recent study surveying Irish physiotherapists using similar methods (McMahon and Connolly, 2013). All responses were collected online. There were no requests for a paper copy of the survey.

3.3.2.2 Survey respondent demographics

Respondents' demographics and workplace characteristics are presented in Table 3.7. Two hundred and forty two respondents (43%) hold a post-graduate qualification while only approximately one quarter (n=149, 26.5%) had completed a CPD course on motivational strategies. One hundred and forty five (25.8%) respondents work in two practice areas and a further thirty seven (6.6%) work in three or more. Almost one half of the sample reported working in two or more clinical settings. One hundred and thirty three (23.6%) reported working in two clinical areas and one hundred and twenty seven reported working in three or more (22.6%)

Demographics		(n=562)	
Average Years Qualified		13.5	
Range of Years Qualified		1-44	
Standard Deviation of Years Qualified		10.32	
		n=	%
Highest Qualification Achieved	Diploma	38	6.8
	Bachelor degree	282	50.2
	Higher Diploma (Post-graduate)	57	10.1
	Masters (Taught)	138	24.6
	Masters (Research)	32	5.7
	Doctoral (DPT)	3	0.5
	Doctoral (PhD)	12	2.1
Completed CPD course	Yes	149	26.5
Practice area	Private practice	181	32.2
	Out-patient department	124	22.1
	In-patient care	130	23.1
	Primary care	109	19.4
	Other	114	20.3
	Disability services	33	5.9
	Education/Research	29	5.1
	Nursing home/Hospice/Day hospital	20	3.5
	Sport	11	1.9
	Management	7	1.2
	Voluntary work	7	1.2
	Musculoskeletal triage	3	0.5
	Students	3	0.5
Clinical area	Cardio - respiratory	68	12.1
	Neurology	94	16.7
	Orthopaedics	148	26.3
	Rheumatology	51	9.1
	Women's health & continence	50	8.9
	Rehabilitation of older people	145	25.8
	Musculoskeletal	318	56.6
	Paediatrics	89	15.8
	Other	65	11.5
	Sports	16	2.9
	Intellectual disability	9	1.6
	Lymphoedema	5	0.9

Table 3.7 Survey respondent demographics

3.3.2.3 Importance of motivation

Two hundred and four respondents (36.3%) agreed that motivational strategies were 'important' and 332 respondents (59.1%) agreed that they were 'very important' for their practice, while 187 (33.3%) and 365 respondents (64.9%) agreed that they were 'important' or 'very important' for physiotherapists.

3.3.2.4 Knowledge

The awareness levels of MI, SDT, SCT and CBT among physiotherapists and confidence in their application are presented in Figures 3.2 and 3.3.

Of the respondents who had completed a CPD course in motivational strategies (n=149,) a word frequency count showed that MI was the most popular CPD course (n=37) with 24 participants completing courses on SDT and 10 on CBT. A word frequency count revealed that the two main barriers to implementing motivational strategies listed by respondents were a lack of time (n=119) and lack of training (n=101).

Physiotherapists' knowledge of the importance of, and confidence in their ability to influence self-efficacy, planning, autonomy, realistic outcome expectations and the patient's feelings of being empathised with are presented in Figures 3.4 and 3.5.

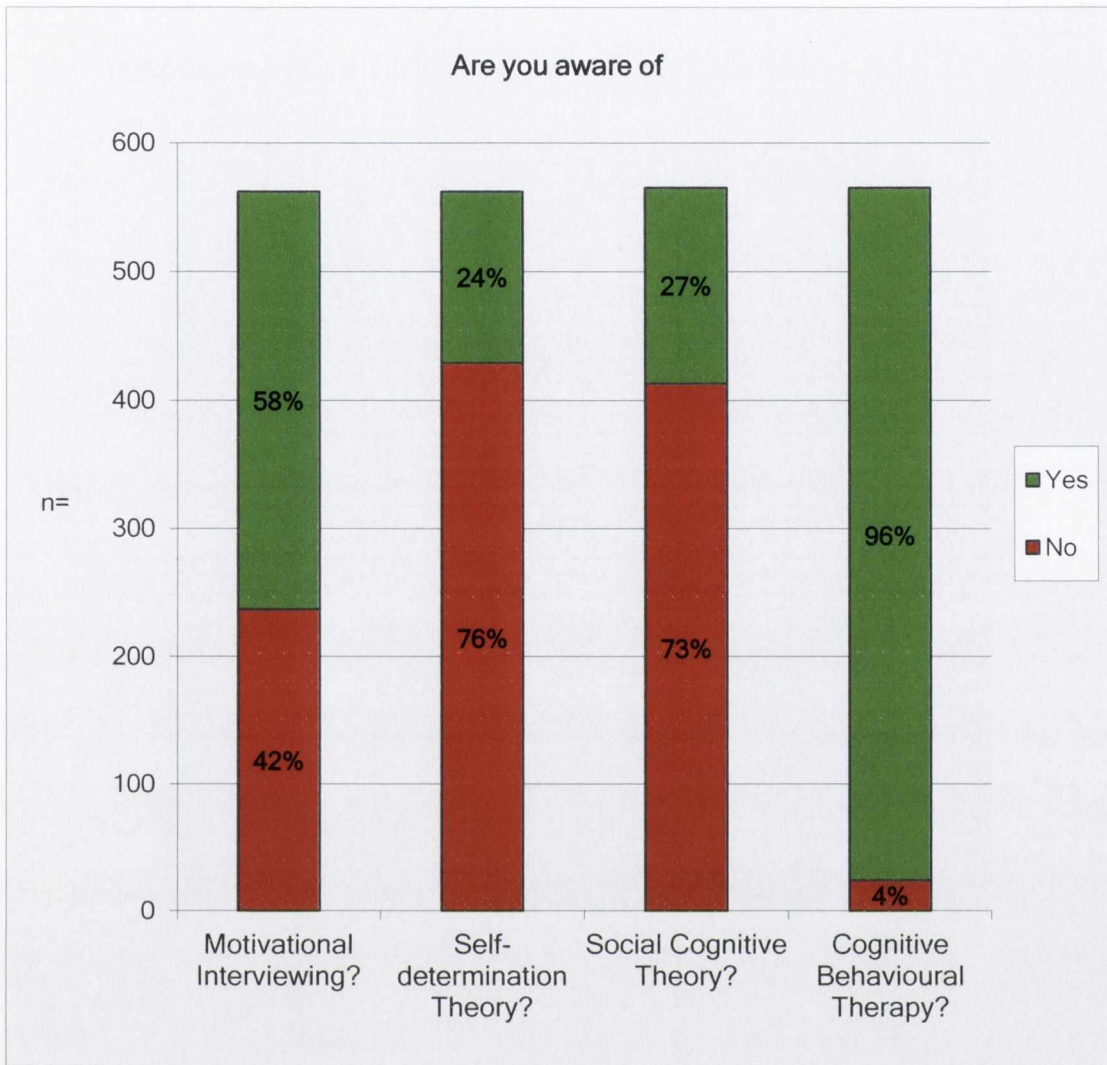


Figure 3.2 Respondent self-reported awareness levels of motivational interventions

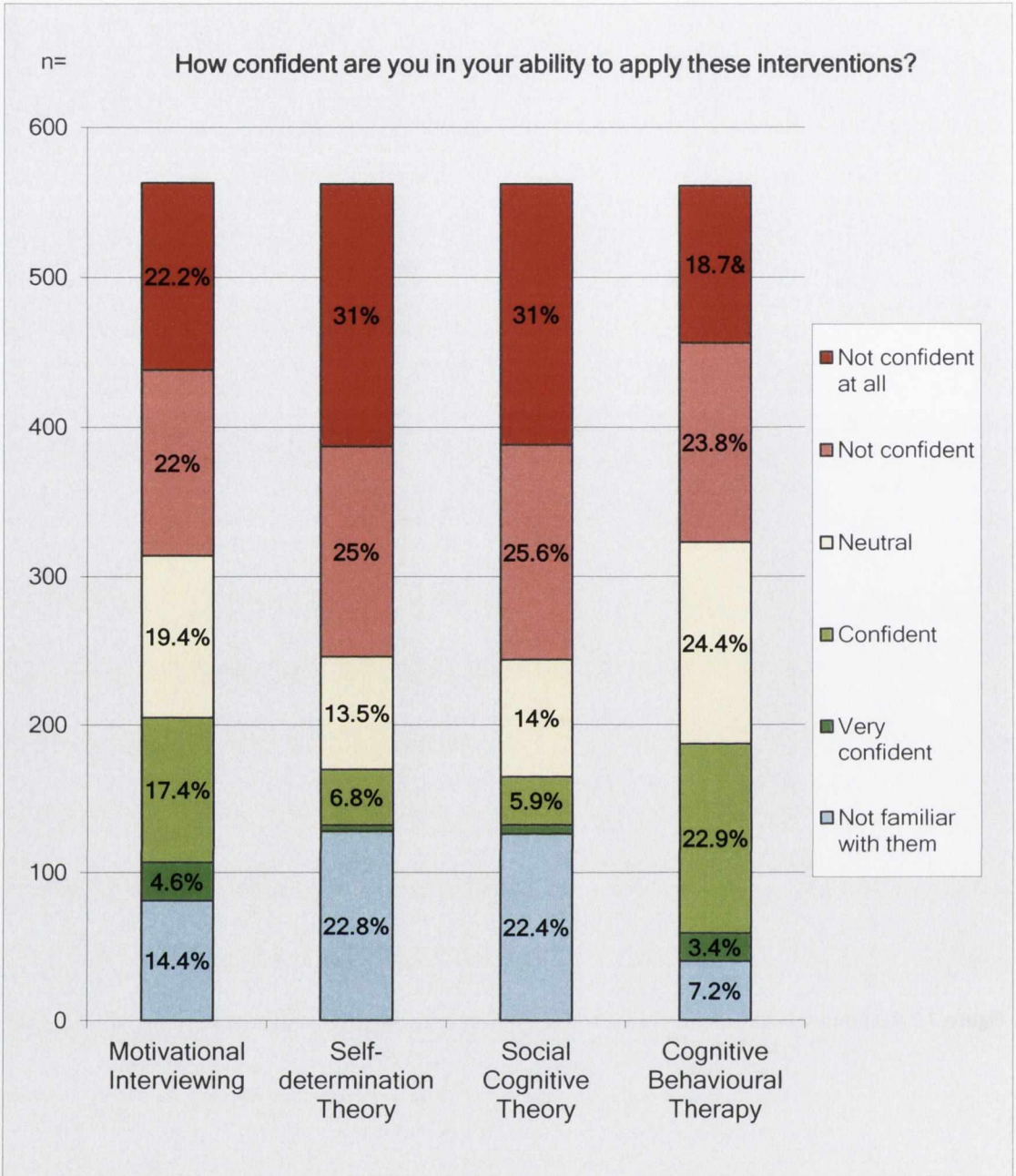


Figure 3.3 Respondent confidence in ability to apply interventions

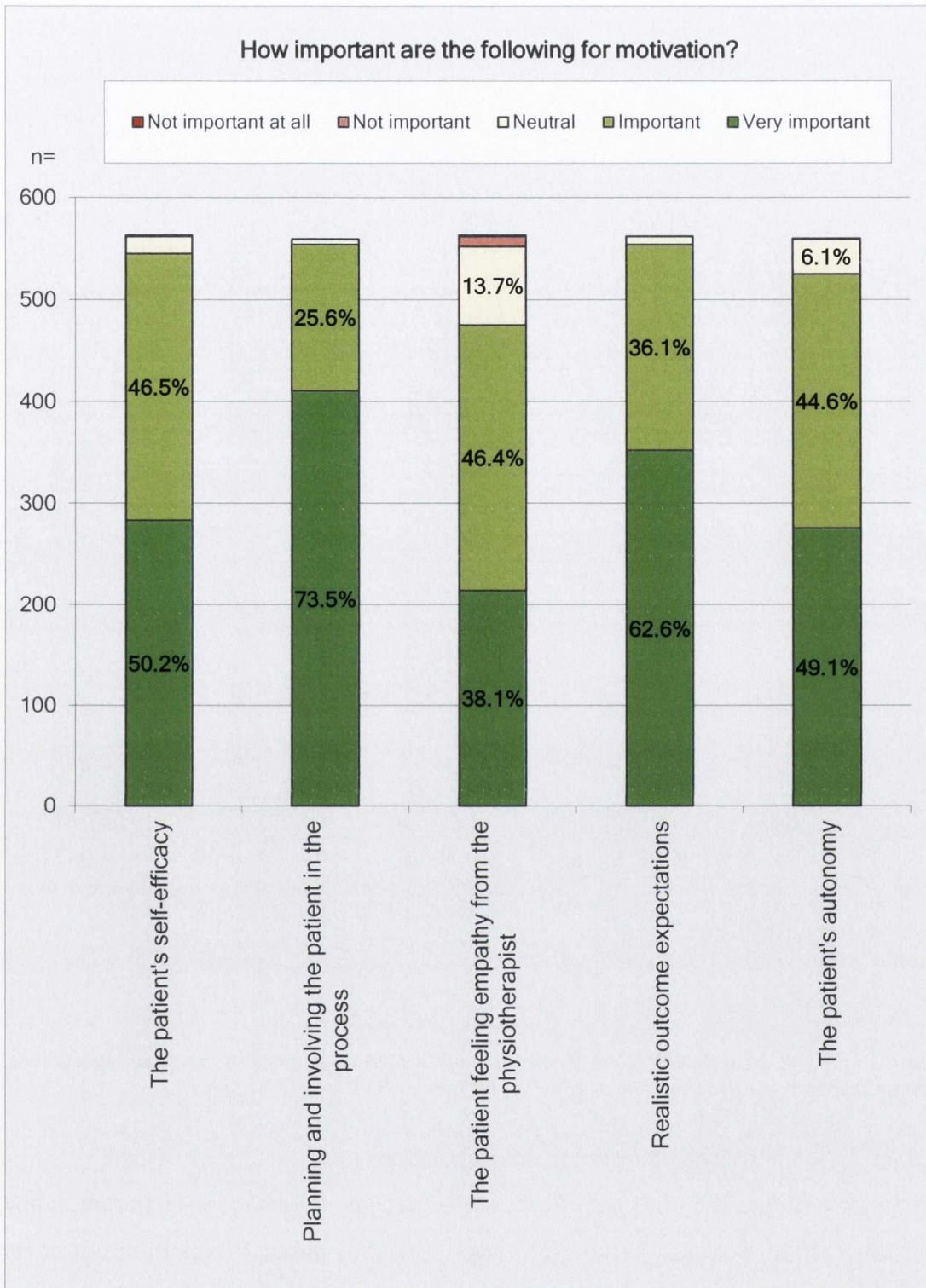


Figure 3.4 Importance of concepts influencing motivation

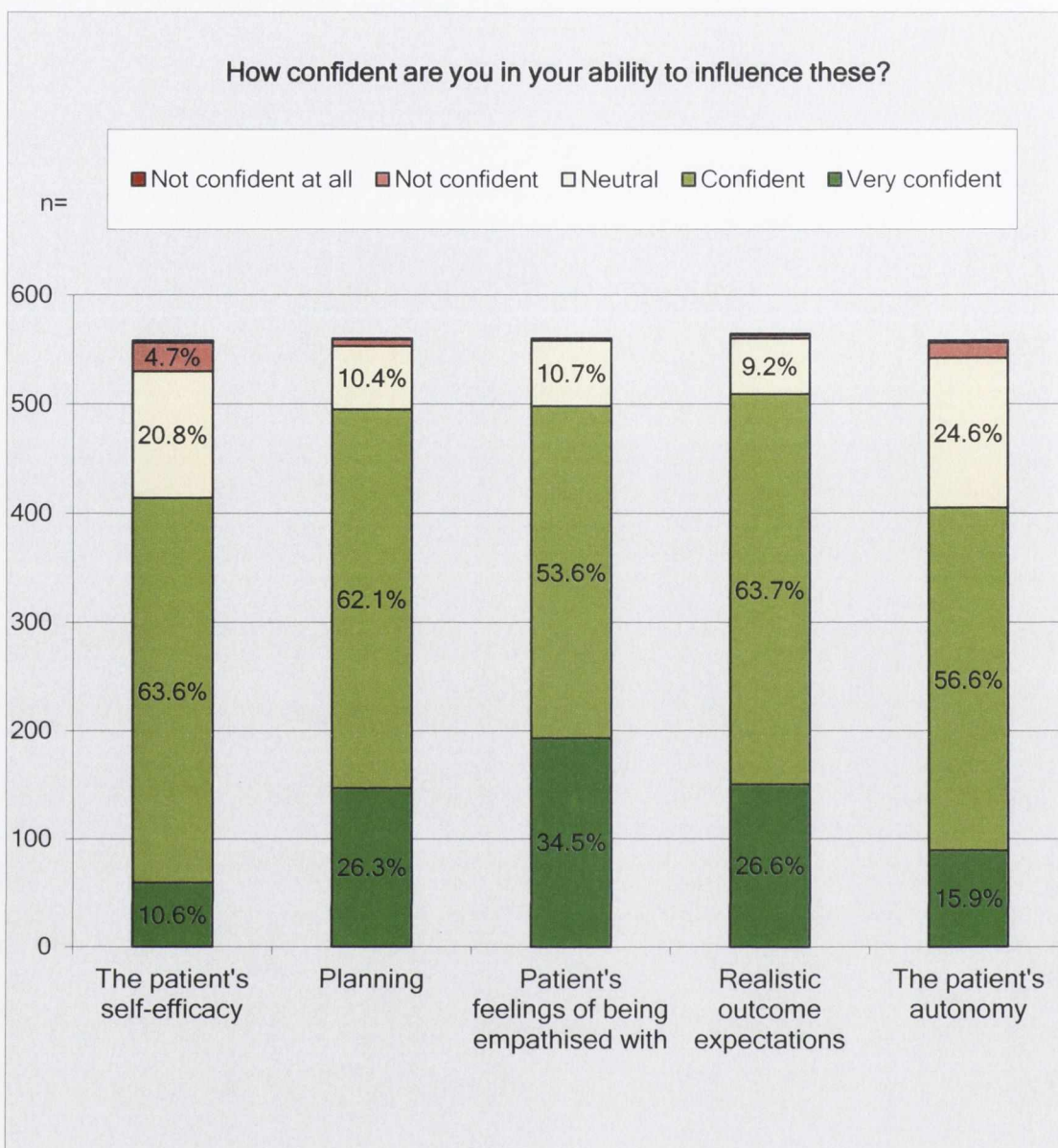


Figure 3.5 Confidence in the ability to influence self-efficacy, planning, empathy, outcome expectations and autonomy

3.3.2.5 Theme 1: Factors influencing motivation

Pain was ranked as the most important, while disability, expectations of physiotherapy, and previous physiotherapy experience were ranked as the least important out of ten different factors that influence motivation. The remaining six factors received similar rankings from respondents.

The rankings are presented in Figure 3.6.

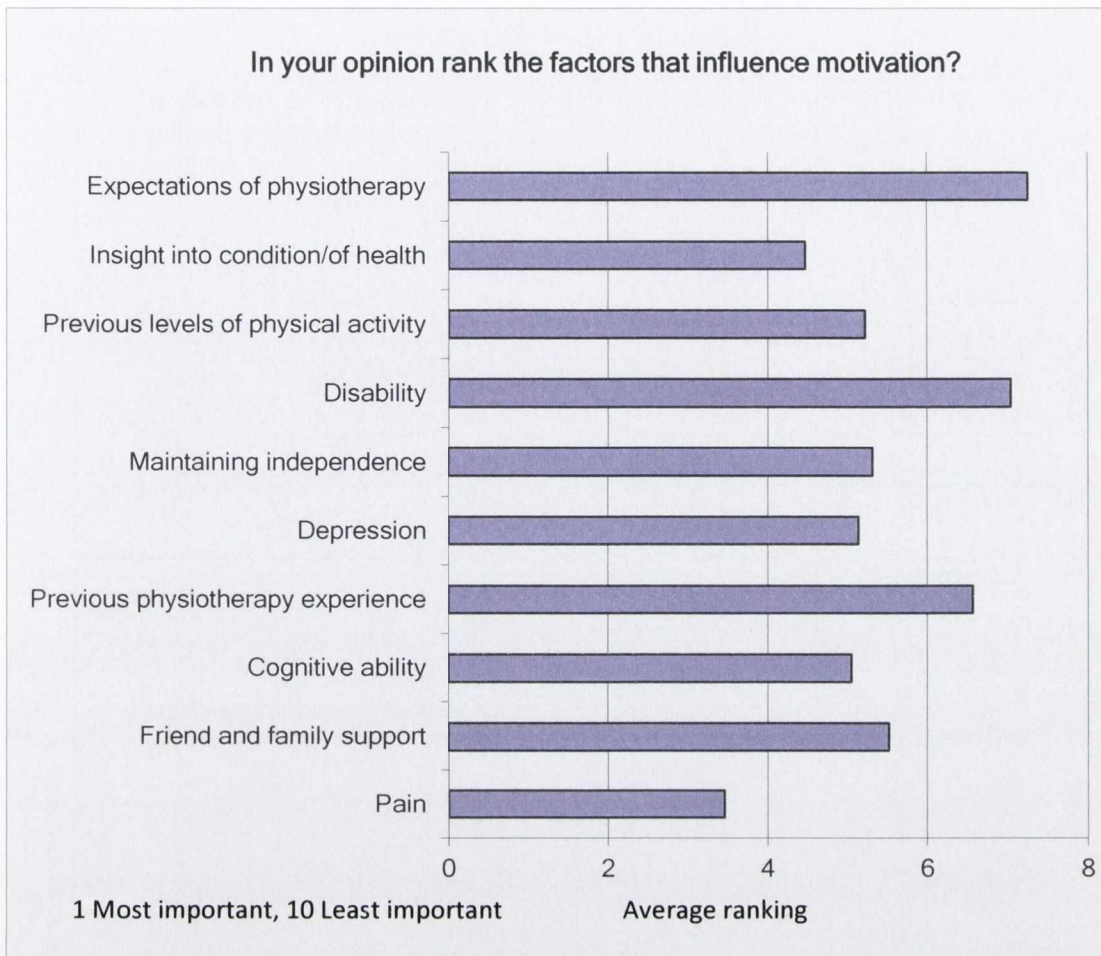


Figure 3.6 Average ranking of factors influencing motivation

3.3.2.6 Theme 2: Strategies currently used to optimise adherence

Almost all respondents reported using education (n=535, 95%) and goal setting (n=479, 85%) to motivate their patients. Reported use of appropriate methods varied: finding something they enjoy n=432 (75%), providing realistic outcome expectations n=390 (69%), identifying barriers n=347 (62%), building self-efficacy n=313 (56%) and promoting autonomy n=284 (51%). The reported use of coercive strategies was low. Results are presented in Figure 3.7.

Respondents reported being successful in motivating their patients, although few agreed that they were very successful. Less than half agreed that they were successful at motivating their patients to increase long-term physical activity behaviour. The reported success of respondents at motivating patients is reported in Figure 3.8.

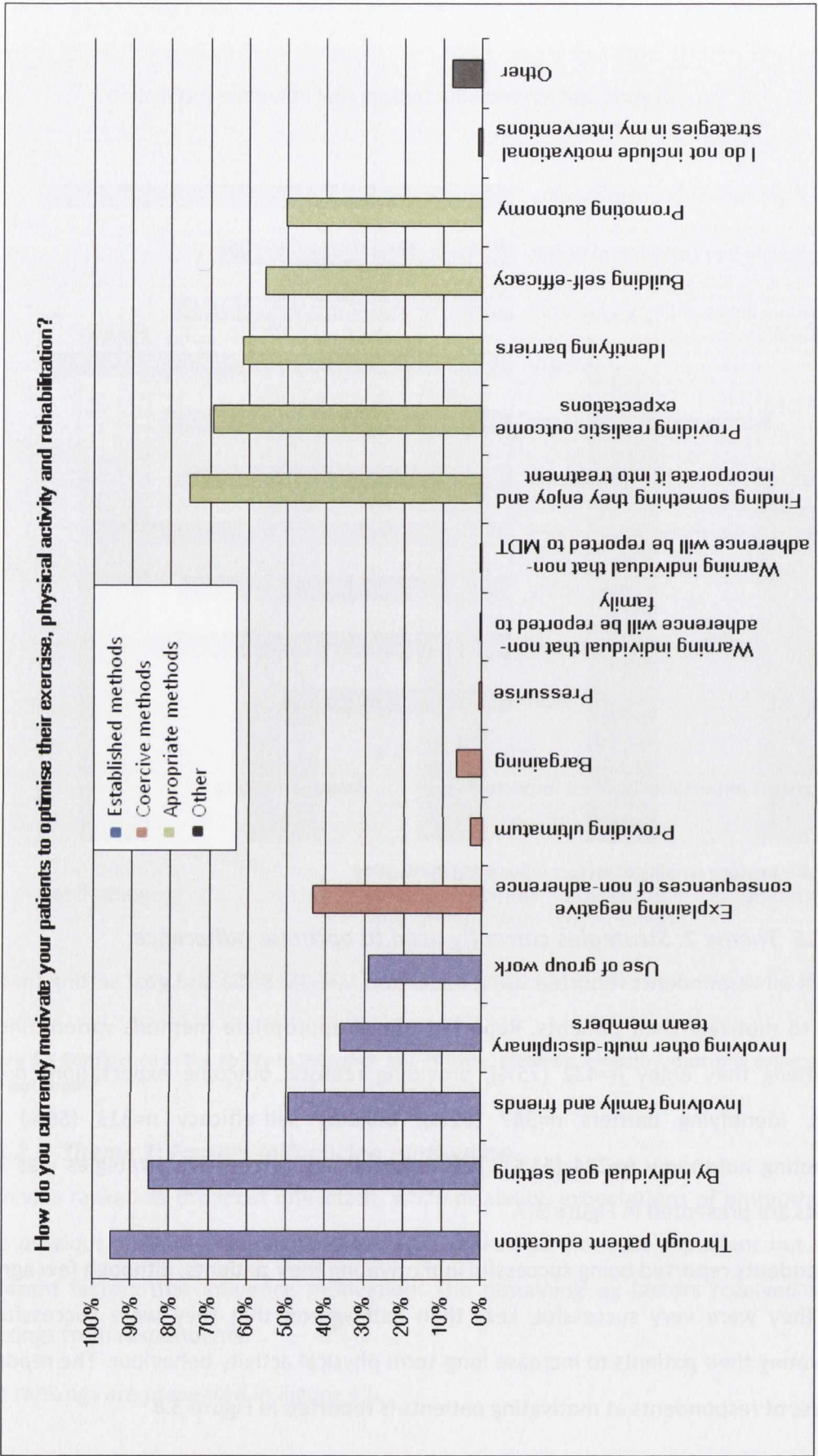


Figure 3.7 Strategies currently used to optimise exercise, physical activity and rehabilitation

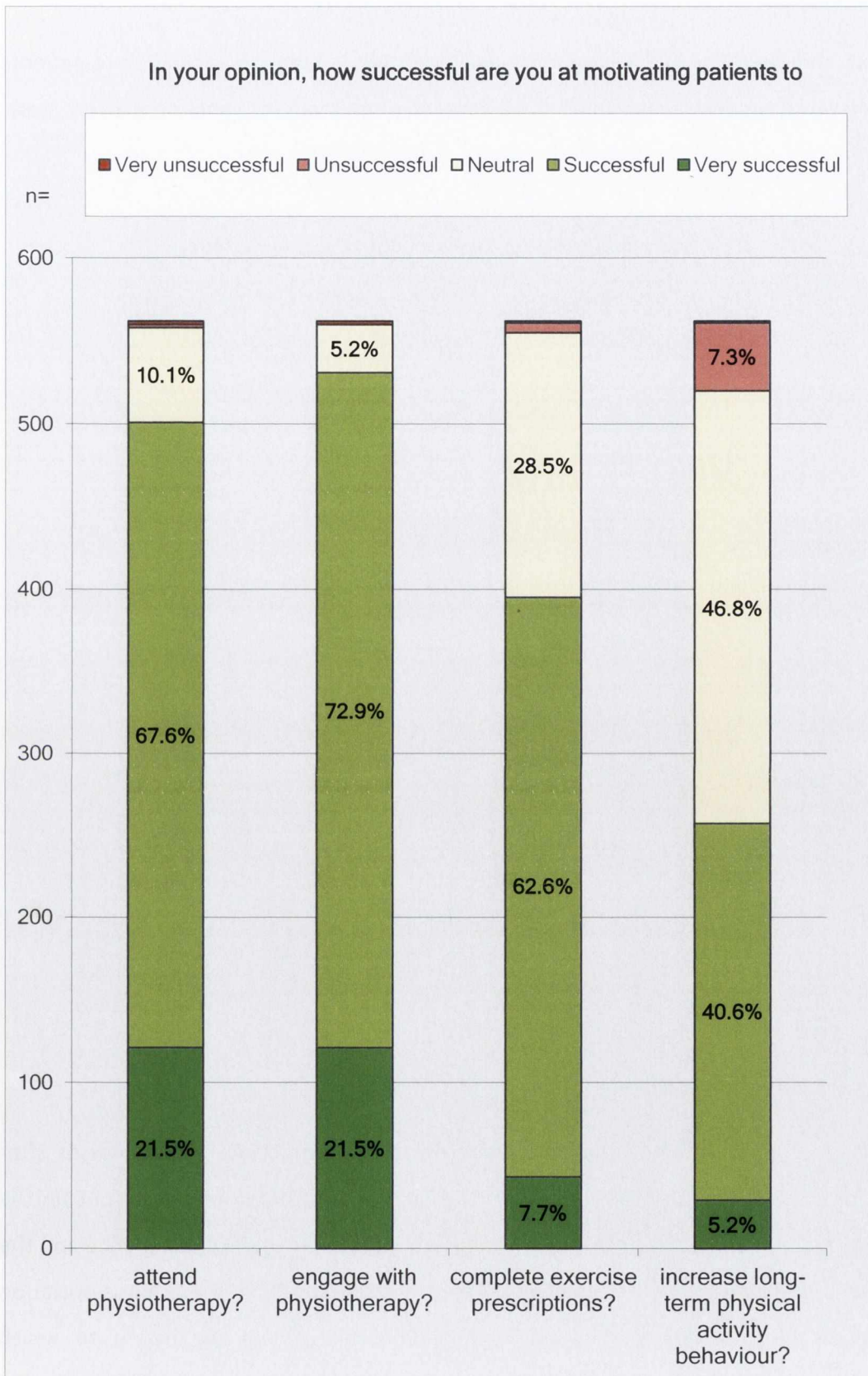


Figure 3.8 Respondents self-reported success at motivating patients

3.3.2.7 Theme 3: Frustrations with non-adherence

Physiotherapists reported frustration to four different statements in relation to patients perceived to be unmotivated and their inability to motivate patients on a Likert scale. The statements and results are contained in Figure 3.9.

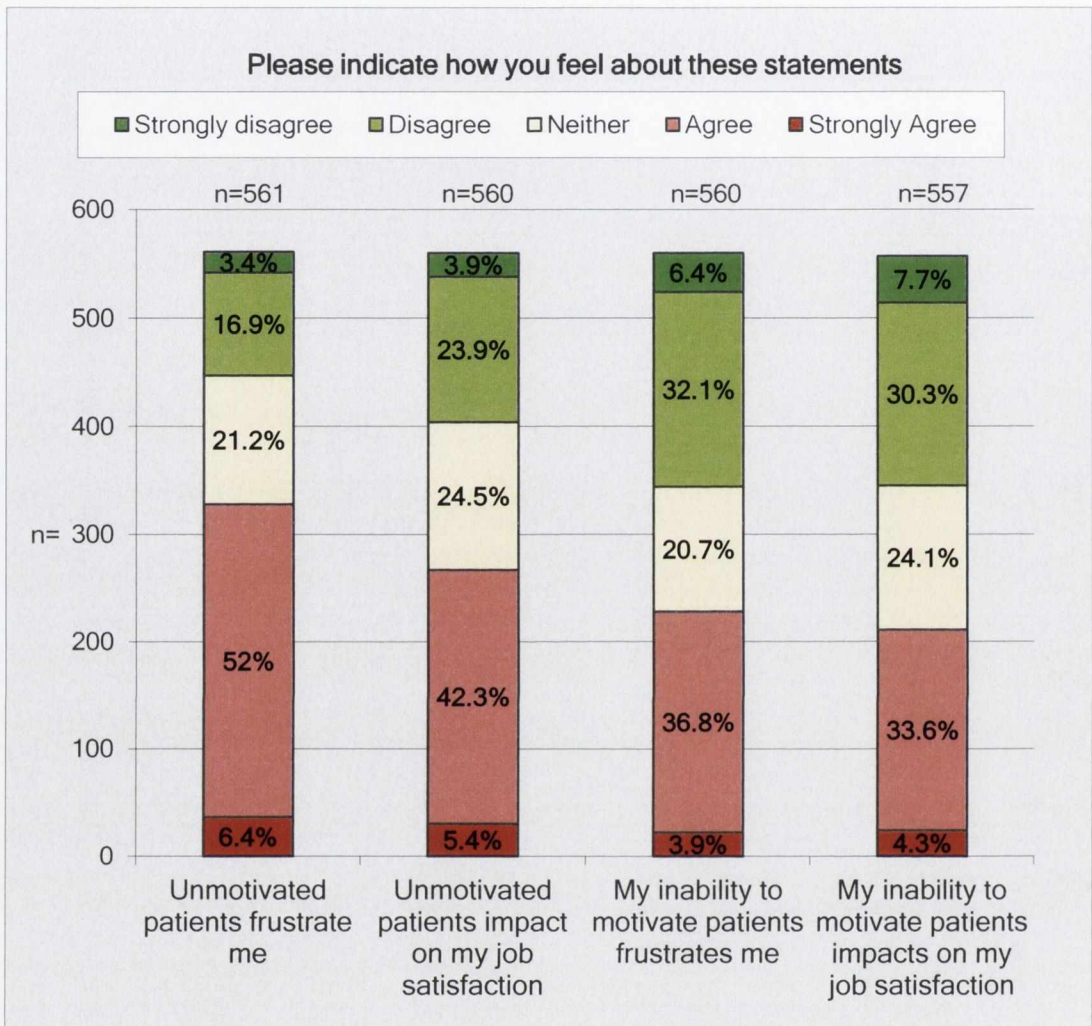


Figure 3.9 Levels of frustration

Focus group data indicated that frustration decreased with clinical experience or after the completion of CPD in the area. An investigation was therefore carried out on the following three questions. Is there any association between years of experience and the extent to which unmotivated individuals frustrate therapists? Is there any association between the completion of a motivational CPD course and the extent to which unmotivated individuals frustrate therapists? Is there any association between the

completion of post-graduate education and the extent to which unmotivated individuals frustrate therapists? The addition of post-graduate education (formal education with a recognised award) was to thoroughly investigate any effect of experience and CPD as a number of respondents who reported completing CPD reported that it was as part of a post-graduate course. Chi-square tests were carried out between the four statements for each of these three questions.

Years qualified was categorised into 1-5 years, 6-10 years, 11-15 years, 16-20 years and over 20 years. Analyses revealed significant association between the first statement, 'unmotivated patients frustrate me' and years qualified $n=561$ $X^2=34.4$ ($P=0.005$) (Figure 3.10). There was no significant association between years qualified and the remaining three questions (Figure 3.11, 3.12 and 3.13). Each chi-square test had no more than 20% of its cells with an expected count of less than 5, therefore Fisher's Exact test was unnecessary.

Years qualified/level of agreement crosstabulation – 'Unmotivated patients frustrate me'
 $n=561$ $X^2=34.4$ ($P=0.005$)

Years Qualified		Level of Agreement					Total
		1= Strongly disagree	2	3=Neutral	4	5= Strongly agree	
		1	2	3	4	5	
1-5 years	Count	1	18	25	91	15	150
	Expected Count	5.1	25.4	31.8	78.1	9.6	150.0
6-10 years	Count	4	22	21	78	7	132
	Expected Count	4.5	22.4	28.0	68.7	8.5	132.0
11-15 years	Count	1	13	23	38	5	80
	Expected Count	2.7	13.5	17.0	41.6	5.1	80.0
16-20 years	Count	4	14	15	28	5	66
	Expected Count	2.2	11.2	14.0	34.4	4.2	66.0
20+ years	Count	9	28	35	57	4	133
	Expected Count	4.5	22.5	28.2	69.2	8.5	133.0
Total	Count	19	95	119	292	36	561
	Expected Count	19.0	95.0	119.0	292.0	36.0	561.0

Figure 3.10 Expected versus observed cell count for years qualified and 'unmotivated patients frustrate me'

Years qualified/level of agreement crosstabulation – ‘Unmotivated patients impact on my job satisfaction’
n=560 X²=22.4 (P=0.132)

Years Qualified		1= Strongly disagree		3=Neutral		5= Strongly agree		Total
		1	2	3	4	5		
1-5 years	Count	2	34	30	72	12	150	
	Expected Count	5.9	35.9	36.7	63.5	8.0	150.0	
6-10 years	Count	5	28	30	62	7	132	
	Expected Count	5.2	31.6	32.3	55.9	7.1	132.0	
11-15 years	Count	4	15	24	35	2	80	
	Expected Count	3.1	19.1	19.6	33.9	4.3	80.0	
16-20 years	Count	6	18	19	20	3	66	
	Expected Count	2.6	15.8	16.1	27.9	3.5	66.0	
20+ years	Count	5	39	34	48	6	132	
	Expected Count	5.2	31.6	32.3	55.9	7.1	132.0	
Total	Count	22	134	137	237	30	560	
	Expected Count	22.0	134.0	137.0	237.0	30.0	560.0	

Figure 3.11 Expected versus observed cell count for years qualified and ‘unmotivated patients impact on my job satisfaction’

Years qualified/level of agreement crosstabulation – ‘My inability to motivate patients frustrates me’
n=560 X²=25.8 (P=0.057)

Years Qualified		1= Strongly disagree		3=Neutral		5= Strongly agree		Total
		1	2	3	4	5		
1-5 years	Count	5	36	31	70	8	150	
	Expected Count	9.6	48.2	31.1	55.2	5.9	150.0	
6-10 years	Count	8	39	27	53	5	132	
	Expected Count	8.5	42.4	27.3	48.6	5.2	132.0	
11-15 years	Count	4	28	21	23	4	80	
	Expected Count	5.1	25.7	16.6	29.4	3.1	80.0	
16-20 years	Count	7	25	14	19	0	65	
	Expected Count	4.2	20.9	13.5	23.9	2.6	65.0	
20+ years	Count	12	52	23	41	5	133	
	Expected Count	8.6	42.8	27.6	48.9	5.2	133.0	
Total	Count	36	180	116	206	22	560	
	Expected Count	36.0	180.0	116.0	206.0	22.0	560.0	

Figure 3.12 Expected versus observed cell count for years qualified and ‘my inability to motivate patients frustrates me’

Years qualified/level of agreement crosstabulation – ‘My inability to motivate patients impacts on my job satisfaction’
n=557 $\chi^2=18.6$ (P=0.291)

Years Qualified		1= Strongly disagree		3=Neutral		5= Strongly agree		Total
		1	2	3	4	5		
1-5 years	Count	7	44	28	63	8	150	
	Expected Count	11.6	45.5	36.1	50.4	6.5	150.0	
6-10 years	Count	10	35	32	47	7	131	
	Expected Count	10.1	39.7	31.5	44.0	5.6	131.0	
11-15 years	Count	7	27	21	21	4	80	
	Expected Count	6.2	24.3	19.2	26.9	3.4	80.0	
16-20 years	Count	9	20	14	18	2	63	
	Expected Count	4.9	19.1	15.2	21.2	2.7	63.0	
20+ years	Count	10	43	39	38	3	133	
	Expected Count	10.3	40.4	32.0	44.7	5.7	133.0	
Total	Count	43	169	134	187	24	557	
	Expected Count	43.0	169.0	134.0	187.0	24.0	557.0	

Figure 3.13 Expected versus observed cell count for years qualified and ‘my inability to motivate patients impacts on my job satisfaction’

Analyses of the completion of CPD and all four statements regarding frustration revealed no significant association between any of the four statements and the completion of CPD. Results of the Chi-square analyses for all four statements are presented in Figure 3.14, 3.15, 3.16 and 3.17).

CPD/level of agreement crosstabulation – ‘Unmotivated patients frustrate me’
n=561 $\chi^2=7.7$ (P=0.103)

Completed CPD		1= Strongly disagree		3= Neutral		5= Strongly agree		Total
		1	2	3	4	5		
Yes	Count	5	35	34	67	8	149	
	Expected Count	5.0	25.2	31.6	77.6	9.6	149.0	
No	Count	14	60	85	225	28	412	
	Expected Count	14.0	69.8	87.4	214.4	26.4	412.0	
Total	Count	19	95	119	292	36	561	
	Expected Count	19.0	95.0	119.0	292.0	36.0	561.0	

Figure 3.14 Expected versus observed cell count for completion of CPD and ‘unmotivated patients frustrate me’

CPD/level of agreement crosstabulation – ‘Unmotivated patients impact on my job satisfaction’

n=560 $\chi^2=4.6$ (P=0.337)

Completed CPD		1= Strongly disagree		3= Neutral	5= Strongly agree		Total
		1	2	3	4	5	
Yes	Count	8	43	33	57	7	148
	Expected Count	5.8	35.4	36.2	62.6	7.9	148.0
No	Count	14	91	104	180	23	412
	Expected Count	16.2	98.6	100.8	174.4	22.1	412.0
Total	Count	22	134	137	237	30	560
	Expected Count	22.0	134.0	137.0	237.0	30.0	560.0

Figure 3.15 Expected versus observed cell count for completion of CPD and ‘unmotivated patients impact on my job satisfaction’

CPD/level of agreement crosstabulation – ‘My inability to motivate patients frustrates me’

n=560 $\chi^2=3.6$ (P=0.462)

Completed CPD		1= Strongly disagree		3= Neutral	5= Strongly agree		Total
		1	2	3	4	5	
Yes	Count	12	52	32	46	7	149
	Expected Count	9.6	47.9	30.9	54.8	5.9	149.0
No	Count	24	128	84	160	15	411
	Expected Count	26.4	132.1	85.1	151.2	16.1	411.0
Total	Count	36	180	116	206	22	560
	Expected Count	36.0	180.0	116.0	206.0	22.0	560.0

Figure 3.16 Expected versus observed cell count for completion of CPD and ‘my inability to motivate patients frustrates me’

CPD/level of agreement crosstabulation – ‘My inability to motivate patients impacts on my job satisfaction’

n=557 $\chi^2=6.9$ (P=0.139)

Completed CPD		1= Strongly disagree		3= Neutral	5= Strongly agree		Total
		1	2	3	4	5	
Yes	Count	18	47	35	42	6	148
	Expected Count	11.4	44.9	35.6	49.7	6.4	148.0
No	Count	25	122	99	145	18	409
	Expected Count	31.6	124.1	98.4	137.3	17.6	409.0
Total	Count	43	169	134	187	24	557
	Expected Count	43.0	169.0	134.0	187.0	24.0	557.0

Figure 3.17 Expected versus observed cell count for completion of CPD and ‘my inability to motivate patients impacts on my job satisfaction’

Analyses of the completion of post-graduate education and all four statements regarding frustration revealed a significant association between the first statement, 'unmotivated patients frustrate me', and the completion of post-graduate education, $n=561$ $\chi^2=13.2$ ($P=0.010$) (Figure 3.18). No significant association was found between any of the remaining three statements and the completion of post-graduate education (Figure 3.19, 3.20 and 3.21).

CPD/level of agreement crosstabulation – 'Unmotivated patients frustrate me'

$n=561$ $\chi^2=13.2$ ($P=0.010$)

Educational level obtained		1= Strongly disagree 3= Neutral 5= Strongly agree					Total
		1	2	3	4	5	
Graduate level	Count	12	39	67	181	21	320
	Expected Count	10.8	54.2	67.9	166.6	20.5	320.0
Post-graduate level	Count	7	56	52	111	15	241
	Expected Count	8.2	40.8	51.1	125.4	15.5	241.0
Total	Count	19	95	119	292	36	561
	Expected Count	19.0	95.0	119.0	292.0	36.0	561.0

Figure 3.18 Expected versus observed cell count for graduate level and 'unmotivated patients frustrate me'

CPD/level of agreement crosstabulation – 'Unmotivated patients impact on my job satisfaction'

$n=560$ $\chi^2=4.9$ ($P=0.295$)

Educational level obtained		1= Strongly disagree 3= Neutral 5= Strongly agree					Total
		1	2	3	4	5	
Graduate level	Count	11	69	75	146	19	320
	Expected Count	12.6	76.6	78.3	135.4	17.1	320.0
Post-graduate level	Count	11	65	62	91	11	240
	Expected Count	9.4	57.4	58.7	101.6	12.9	240.0
Total	Count	22	134	137	237	30	560
	Expected Count	22.0	134.0	137.0	237.0	30.0	560.0

Figure 3.19 Expected versus observed cell count for graduate level and 'unmotivated patients impact on my job satisfaction'

CPD/level of agreement crosstabulation – 'My inability to motivate patients frustrates me'

n=560 $\chi^2=8.9$ (P=0.065)

Educational level obtained		1= Strongly disagree 3= Neutral 5= Strongly agree					Total
		1	2	3	4	5	
Graduate level	Count	18	93	65	133	10	319
	Expected Count	20.5	102.5	66.1	117.3	12.5	319.0
Post-graduate level	Count	18	87	51	73	12	241
	Expected Count	15.5	77.5	49.9	88.7	9.5	241.0
Total	Count	36	180	116	206	22	560
	Expected Count	36.0	180.0	116.0	206.0	22.0	560.0

Figure 3.20 Expected versus observed cell count for graduate level and 'my inability to motivate patients frustrates me'

CPD/level of agreement crosstabulation – 'My inability to motivate patients impacts on my job satisfaction'

n=557 $\chi^2=5.8$ (P=0.213)

Educational level obtained		1= Strongly disagree 3= Neutral 5= Strongly agree					Total
		1	2	3	4	5	
Graduate level	Count	18	98	74	112	16	318
	Expected Count	24.5	96.5	76.5	106.8	13.7	318.0
Post-graduate level	Count	25	71	60	75	8	239
	Expected Count	18.5	72.5	57.5	80.2	10.3	239.0
Total	Count	43	169	134	187	24	557
	Expected Count	43.0	169.0	134.0	187.0	24.0	557.0

Figure 3.21 Expected versus observed cell count for graduate level and 'my inability to motivate patients impacts on my job satisfaction'

These results indicate that physiotherapists with fewer years of experience are more likely to be frustrated by patients perceived to be unmotivated and that physiotherapists with post-graduate education are less likely to be less frustrated by patients who are perceived to be unmotivated.

3.3.2.8 Theme 4: Education

Physiotherapists believe education in relation to motivational interventions to be very important, with the mean survey response being 4.44 on a five-point Likert Scale (1 not important at all, 5 very important) (n=562). Almost all respondents (n=531, 94.5%) agreed that motivational interventions should be included in entry-to-practice education. Survey responses as to when it should be included are shown in Figure 3.22.

When asked about attending a CPD course, 489 of respondents (87%) agreed that they would be interested. Of the 89 respondents who volunteered a comment at the conclusion of the survey, many referred to the need for CPD courses and the need for financial support for such courses.

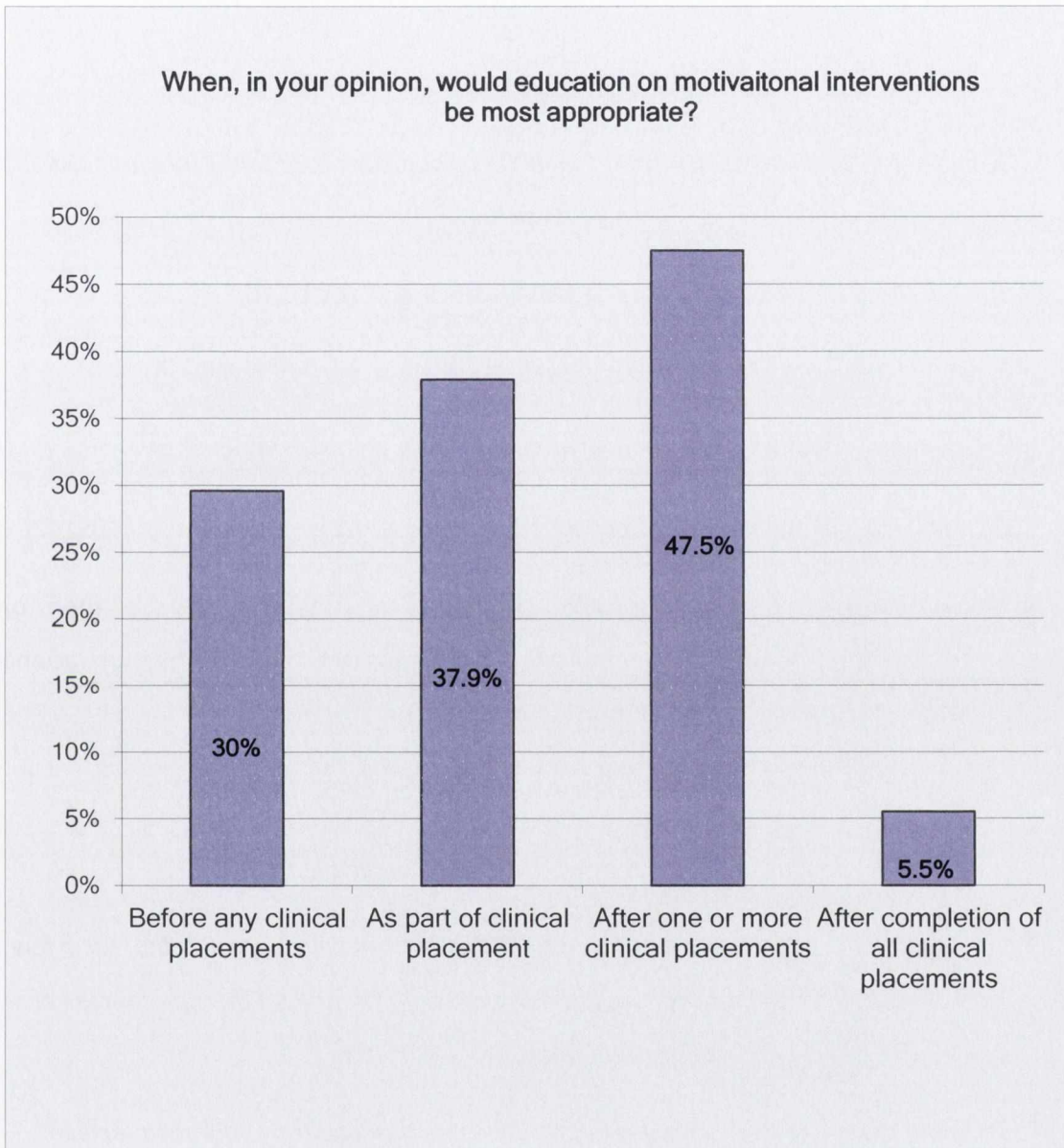


Figure 3.22 When education would be most appropriate during pre-registration education

3.3.2.9 Comments

Eighty nine respondents left voluntary comments. These comments fell into two categories; importance and education. Importance included comments on the importance of motivational interventions in physiotherapy and the importance of research in this area.

"This area is of enormous importance." [MOS169]

*"The older I get the more important I think these approaches are, it is fundamental."
[MOS478]*

"I am pleased to see this issue raised." [MOS536]

"Your area of study is key to getting clients on board." [MOS315]

"Great to have specific studies in this." [MOS203]

"This is a very worthwhile study because compliance with exercise is low." [MOS147]

The second category, education, included comments on interest in CPD, comment on barriers to completing CPD and comments on debating the inclusion of motivational intervention education in entry-to-practice level training.

"Formal CPD in this area would be welcomed." [MOS398]

"More training courses need to be made available." [MOS551]

"Motivational interviewing has been on my PDP (personal development plan) for a few years & keeps getting bumped down the list in favour of manual therapy courses or because of finances!" [MOS383]

"I firmly believe this is extremely important for future undergraduates to receive education and training in motivational strategies." [MOS149]

*"Including these interventions in entry level education I think is overwhelming considering the breadth and depth of the material that already has to be covered."
[MOS484]*

3.4 Discussion

The overall aim of this study was to explore the views and current practice of physiotherapists in relation to motivation and HBC. The results clearly indicate that this is an important area for the profession and that many factors, both modifiable and un-modifiable, impact on motivation. Evidence-based methods of optimising adherence to physiotherapy and eliciting health behaviour are in use to some extent but are not the most commonly utilised methods, demonstrating a deficiency in current practice. Coercive methods, which are ineffective or may even be de-motivating, were also shown to be in use. The reported use of these methods was, however, low. There is a need, acknowledged by study participants, for education and up-skilling throughout the profession to bridge this gap in practice and optimise motivational strategies in the future.

The recruitment of a sample which achieved a diversity of opinion and covered a broad range of viewpoints was successful. All the core areas of practice, a wide range of workplaces and range of years of experience were recruited. Both stages of this study achieved this. The sample demographics for both stages were very similar (Table 3.3 & 3.6). The average years qualified differed only by two years between the focus group sample and the survey respondents. The percentage of participants who had obtained a post-graduate qualification differed only by 8.4%. The percentage of participants who had completed CPD on motivational interventions was also very similar, with a difference of only 3.5%.

3.4.1 Current practice

Of the strategies currently being used by physiotherapists to optimise adherence and elicit HBC, educating the patient and setting goals are by far the most utilised. Patient education and goal setting are well established strategies and are widely used, yet they do not work in isolation to improve long-term adherence. For example it is common knowledge that exercise is good for you yet inactivity is on the rise. This finding is consistent with similar studies, for example goals were also among the most popular methods used by sports physiotherapists (Arvinen-Barrow et al., 2007). Providing

information about rehabilitation and setting relevant goals was reported by 18 of 32 MDT members of a stroke unit as the way they change a patient's motivation (Maclean et al., 2002). In a study of physiotherapists and occupational therapists working in a rehabilitation setting, providing education and setting goals were the most popular methods employed to facilitate patient engagement (Lequerica et al., 2009).

A considerable gap in achieving best practice, is evident as not all respondents reported using appropriate evidence-based methods. Appropriate strategies however are reported to be the most popular methods, second only to educating the patient and setting goals. This is also consistent with the findings of the above studies. Lequerica et al (2009) reported building rapport, allowing patient control and encouragement as the three most popular methods following goals and education. These strategies mirror being empathetic, promoting autonomy and building self-efficacy and were reported by less than 30% of the sample in their study. Members of the MDT in Maclean et al (2002) also reported building rapport as a technique for changing motivation (24 of 32). In the larger more diverse sample in this study the use of appropriate strategies was higher but similarly was not the most utilised.

The focus group study revealed that coercive methods are in use, something not published in previous research. Data from the focus groups indicated that this was prevalent, however survey results indicate the use of coercion is lower than expected when compared to the focus group data. These methods were discussed by more than one focus group yet less than 10% reported using 'pressuring', 'providing ultimatums' and 'bargaining'. This low reported use of coercive strategies from the survey respondents may have been influenced by obsequiousness bias, commonly known as social desirability bias or faking good (Cook, 2010), where respondents may not want to admit to resorting to these methods. In an attempt to limit this bias, the survey was designed so that respondents were anonymous, and this was made clear to them. This finding may also reflect that fact that respondents might not recognise their use of coercive methods. They may believe that they are working in what they believe to be the person's best interest and are providing education rather than pressurising or providing ultimatums. Despite these biases the low result may be a true reflection of

practice, which would indicate that coercion is used by the minority. Neither Maclean et al (2002) nor Lequerica et al (2009) reported the use of any coercive strategies. In both of these studies, participants volunteered information by answering an open-ended question on a survey and a face-to-face interview question. Neither study directly asked their sample about these coercive methods.

Reported success of current practice differed between the focus groups and survey respondents. Focus group participants mostly discussed how their success at motivating varied. Survey respondents reported being much more successful (Figure 3.8) with the least success reported in increasing long-term physical activity behaviour. This result may be affected by respondents estimating their success as they may not have many long-term patients or may not have the opportunity to follow up with all of them. This result may also be influenced by obsequiousness and self-selection bias (Cook, 2010) or the fact that focus groups allow for much more in-depth thought and discussion, allowing participants to comprehensively analyse their success.

A theme identified in the focus group data, and one which was investigated in the survey, was that of frustration. Unmotivated patients and the inability to motivate them are a cause of frustration for physiotherapists and impacts on job satisfaction (Figure 3.9). Although frustration was not investigated by Maclean et al (2002), nine of the participants reported a preference for interacting with motivated patients. One participant in this study, a physiotherapist, felt less inclined to interact with patients perceived to be unmotivated. Three participants reported feeling guilty about patients they could not motivate, while one described a sense of failure. Mixed messages from the MDT and how they negatively affect motivation were also discussed in this study with one participant specifically reporting mixed messages regarding the promotion of independence from the physiotherapist and dependency from the nurses. This was also the case in this study where frustration with the MDT was a theme that was evident from the focus group data. Results regarding frustration and job satisfaction indicate that this is a serious matter for physiotherapists. Focus group participants spoke of gaining satisfaction from motivating previously unmotivated patients. Proper education of physiotherapists on the correct skills and strategies may increase the chance of

gaining satisfaction from motivating the unmotivated and might decrease frustration. This has been shown for other HCPs. HBC training had a positive effect on job satisfaction among dieticians, who also perceived their patients were more satisfied (Whitehead et al., 2009a). Similarly, communication skills training had a positive effect on difficulties nurses had in their interactions with patients, families and co-workers (Arranz et al., 2005).

The effect of years of experience and the completion of CPD courses on frustration and job satisfaction differed between the two stages of the study. Data from the focus groups indicated an association between frustration and experience, with experience and CPD decreasing frustration. These relationships were investigated in the survey data with the appropriate statistical tests and the data revealed that there is a weak association between patients perceived to be unmotivated creating frustration and years of experience and completion of post-graduate education. There may in fact be no relationship or the differences between the methodological stages may be explained by the greater thought and discussion on the topic fostered by participating in a focus group.

3.4.2 Knowledge

Awareness levels for CBT (96% aware) and MI (58% aware) were high while those of SDT (24% aware) and SCT (27% aware) are low (Figure 3.2). High levels of awareness of CBT and MI are not surprising as CBT is well established in healthcare (Gaudiano, 2008) and MI is becoming more popular (Lundahl et al., 2010). Awareness of SDT and CPD courses in SDT were boosted by participation in a recent study in Dublin, Ireland. The CONNECT Trial was a SDT based communication skills training programme for physiotherapists on low back pain patients' adherence to rehabilitation recommendations (Lonsdale et al., 2012).

Knowledge of the importance of planning (96.7% agree it is important or very important), patient's self-efficacy (99.1% agree it is important or very important), autonomy (93.7% agree it is important or very important), and the patients' feelings of being empathised with (84.5% agree it is important or very important), is high (Figure

3.4), as is confidence in the ability to influence these factors (planning 88.4% confident or very confident, the patient's self-efficacy 74.2% confident or very confident, autonomy 72.5% confident or very confident and the patients' feelings of being empathised with 88.1% confident or very confident) (Figure 3.5). Despite this, building self-efficacy and promoting autonomy are only utilised by just over half of the respondents (56% n=313 and 51% n=284 respectively). This is a low figure considering how important autonomy and self-efficacy are with regards to motivation and the promotion of autonomous self-managers (McGrane et al., 2014). It is also low considering that this importance was acknowledged by the vast majority of respondents (93.7% agree autonomy is important or very important, 99.1% agree the patient's self-efficacy is important or very important) (Figure 3.3) and confidence in the ability to influence these factors was high (the patient's self-efficacy 74.2% confident or very confident, autonomy 72.5% confident or very confident)(Figure 3.4). The reported confidence levels may be an over-estimation, as the answers may be subject to a confidence bias (Pallier et al., 2002). Despite this bias, the findings imply that there are barriers present to the use of promoting autonomy and building self-efficacy. Lack of time and lack of training were the two barriers listed by respondents who had completed CPD while focus group participants spoke of frustrations with regards to time and MDT colleagues. A further study is warranted to investigate this question; to explore potential barriers, to identify any facilitators and to establish why physiotherapists are not practicing in this manner despite high levels of knowledge and confidence.

3.4.3 Views of practicing physiotherapists on motivation and health behaviour change in physiotherapy

3.4.3.1 Importance of motivation

It is clear from both stages of this study that physiotherapists believe that motivation is an important aspect of physiotherapy, both for their own practice and for the profession as a whole. Voluntary comments left by respondents mentioned the importance of this issue, the importance of research in this area and the need for CPD opportunities. The findings of this study are similar to studies involving physiotherapists, occupational

therapists and dieticians (Lequerica et al., 2009, Whitehead et al., 2009a). Lequerica et al (2009) did not ask participants directly about the importance of motivation but reported that their findings suggested patient engagement was considered to be an important consideration in working with rehabilitation patients.

3.4.3.2 Factors influencing motivation

Motivation was recognised as a complex issue by the focus group participants and this complexity is evident in the survey by the lack of reported spread in the ranking of factors that influence motivation reported in the survey. Many of these factors, such as pain, were reported to be both a motivator (people will be keen to rid themselves of pain) and as a de-motivator (people will be avoidant due to their pain). Similar results were obtained by Lequerica et al (2009). Fear of pain was reported most frequently with a small spread among the other barriers to patient engagement listed (Lequerica et al., 2009). Many similar factors were described by members of the MDT in Maclean et al (2002), including personality, age, the influence of friends and family, the rehabilitation environment, their own behaviour and cultural factors. In a study of sports physiotherapists, understanding of the injury and depression were the highest ranked characteristics of coping with injury (Arvinen-Barrow et al., 2007).

There are many factors that physiotherapists cannot influence, such as demographics, condition and personality, making those that can be influenced even more important. Physiotherapists ought to be aware of the ways in which their behaviour affects motivation (Maclean and Pound, 2000). Expectations of physiotherapy, insight into condition and previous experiences of physiotherapy are factors that the profession can immediately address. Whether previous experiences with physiotherapy are positive or negative will determine if they are a motivator or a de-motivator. Negative experiences may be impossible to completely eliminate, making it crucial for the profession to foster positive experiences. Both patients and the profession can only benefit from having positive experiences act as a motivating factor. Appropriate education of clients on their condition and dispelling myths surrounding physiotherapy can be immediately addressed by physiotherapists without any specific education on motivation; myths such as physiotherapists can 'fix' a patient with hands-on techniques. The addition of

appropriate communication methods and evidence-based motivational strategies would help eliminate negative experiences and enhance outcomes for the patient. If all physiotherapists optimised motivation and elicited HBC in an evidence-based manner myths would be dispelled, patients would know what to expect and motivation would improve, impacting on adherence, autonomous self-management and HBC.

3.4.3.3 Education

Study participants were strongly of the opinion that education on motivational interventions is warranted. This is clearly evident from the results of both stages of this study. Approximately 95% of survey respondents agreed with including motivational interventions at entry-to-practice level education, while similar numbers (87%) were interested in attending CPD or already had (7.8%) ($87\%+7.8\%=94.8\%$). These figures support the findings of the importance of motivation in physiotherapy. If participants believe this area is of such importance then it follows that they believe education on this subject is necessary. There is, however a discrepancy between opinions and action as less than 10% of respondents had taken a CPD course. The reasons behind this discrepancy require further investigation, however the availability of courses, funding of courses and a preference for learning manual skills were suggested as barriers in the comments section of the survey.

Current entry-to-practice education does not reflect the importance of this area in the opinions of respondents. Research has shown that proficiency in promoting behavioural change and self-efficacy is not an emphasis or focus for entry-to-practice level physiotherapy education, both in clinical education and the curriculum (O'Donoghue et al., 2012, O'Donoghue et al., 2011). This is not unique to Ireland. Research on 116 physiotherapy programmes in six countries, including Ireland, concluded that although health promotion is part of the curriculum in most institutions, instruction method, time allocated and content may be insufficient (Bodner et al., 2013). Instruction on methods of health promotion, such as behaviour change theories, with students is lacking in the curriculum internationally as is practical clinical instruction on the practical use of health behaviour change theories (Bodner et al., 2013). An emphasis on population based healthcare must be integrated into entry-to-practice level education to allow the

profession to move its focus from impairment, ill health, injury and disability to one of health and wellbeing (Dean, 2009a).

Focus group participants debated as to when in the entry-to-practice level curriculum it should be included; before any clinical placements begin, during clinical placement, after the completion of some clinical placements or after completing all clinical placements. This was also investigated in the online survey (Figure 3.9). The consensus was that students should have experience of patient-therapist interaction and that it should occur before the completion of clinical placements. This would allow the students to have an understanding of the problem of lack of adherence before commencing specific training in this area and the opportunity to practice the skills they have learnt with patients. It is in line with previous research that has shown that students succeed best in developing higher-order knowledge and skills when given multiple opportunities to practice what is learned (Diamond, 2009, Gardiner, 1996).

Of those who had completed a CPD course and provided the date (n=107/141), the vast majority (83.2% n=89) had completed it in the last three years, showing the rising recognition amongst the profession of the importance of education in this area. Many survey respondents who submitted voluntary comments, requested to be informed of up-coming courses, while others bemoaned the lack of course availability and financial support. Focus group participants who had completed CPD discussed the barriers to implementing the new skills. Lack of time, support and training were the main barriers discussed. When survey respondents who had completed CPD were asked to list any barriers to their use, lack of time and training were listed most frequently. A lack of training may refer to continued training, such as refresher courses. This barrier may also refer to a lack of training by colleagues. This may be a contributing factor to the frustrations with the MDT where MDT and physiotherapy colleagues who are not trained by undermine some of the work done by physiotherapists trained in HBC techniques. There is a need to investigate this more thoroughly, to recognise all barriers that may exist and to ascertain any possible facilitators to implementation.

3.4.4 Implications for practice

This study has demonstrated that how physiotherapists currently motivate patients needs to change to incorporate more appropriate, evidence-based methods. Knowledge of appropriate methods is high, as is awareness of two evidence-based theories, CBT (96% aware) and MI (58% aware), for eliciting HBC and optimising adherence to physiotherapy. The use of coercive power, informational power and expert power are ineffective methods of eliciting change and influencing others and are evidently still in use. Highlighting that such strategies are ineffective may diminish their use. Coercive power is the use of the threat of force (physical, social, emotional, political, or economic force) or the threat of rejection or disapproval from a person of value. Informational power is the ability to bring about change through the resource of information and expert power is using what one knows, experience, reputation, credentials and/or special skills or talents in the influence of individuals (Raven, 2008, Raven, 1992, Raven, 1965, French and Raven, 1959). These methods are usually concerned with compliance which is understood to mean the act of conforming or yielding, the tendency to yield readily to others, especially in a weak or subservient way (Hayes and McGrane, 2014).

Expectations for physiotherapy, insight into condition and previous experiences of physiotherapy are factors that influence motivation and are simple factors that physiotherapists can have a positive effect on without specific motivational training. The provision of education in this area, both at entry-to-practice level and during CPD, is required to ensure the profession is using evidence-based approaches and to eliminate the use of coercive methods. This was recognised by the majority of the study participants. Education at entry-to-practice level is required in order to prevent physiotherapists entering the profession using incorrect strategies. The opportunity to practise skills must be provided throughout their entry-to-practice training. Physiotherapists who are involved in the clinical education of student physiotherapists should also be proficient at using evidence-based strategies in order for entry-to-practice education to continue seamlessly while on clinical placement. CPD opportunities are required to educate qualified physiotherapists and should be prioritised by management. There is a need to investigate current CPD to discover if CPD

in its current format is effective. The discovery of any potential barriers and facilitators to their integration into practice will assist with integrating evidence-based strategies and will inform future education in this area.

3.4.5 Limitations

Some methodological limitations should be considered when interpreting the results of this study. Both stages of this study relied on physiotherapists volunteering to participate. Self-selection bias may be present as a result of this. People are more likely to respond to questionnaires if it interests them (Eysenbach and Wyatt, 2002). The demographics and workplace characteristics of both stages were similar, increasing the potential for the presence of self-selection bias in both stages. There was an over-representation of musculoskeletal physiotherapists in both stages, while there was a higher proportion of physiotherapists working in private practice in stage two (Table 3.2 & 3.6). This may also have been a consequence of self-selection bias. Many survey respondents however, reported working in more than one practice area (32.4%) and more than one clinical setting (56.2%) and the hospital based basic-grade physiotherapists who participated in stage one have rotated through a range of clinical areas. It is therefore likely that the opinion of these physiotherapists is based on experiences from more than one workplace and more than one clinical area. This decreases the likelihood that the opinions of hospital in-patient based physiotherapists may not have been captured to the same extent as private practice musculoskeletal physiotherapists.

Recruitment for the survey made use of a gate-keeper, the ISCP. This may have introduced a non-response bias as there are physiotherapists practising in Ireland who are not members of the ISCP. Despite this, a response rate to the survey of approximately 26.3%, although in line with the literature (Connell et al., 2014, Chipchase et al., 2009, Braithwaite et al., 2003, Wajon and Ada, 2003, Whitehead et al., 2009a) and higher than a recent Irish study of physiotherapists using similar methods (McMahon and Connolly, 2013), is low and may have led to a non-response bias. The calculated response rate is an approximation due to the fact invitations were sent by a third party. It is impossible to know how many of the 2,399 physiotherapists on the mailing list

received the invitation email. Email addresses could be incorrect, email accounts may not be checked frequently or the invitation email may have been diverted to a spam folder. Efforts were made to increase the response rate with an incentive and a reminder email. A number of incomplete surveys (n=70) were excluded from the analysis. An effort to prevent this was made with the inclusion of a progress bar. While the impact of a non-response bias cannot be negated, the results appear to be representative of the physiotherapy profession. The low response rate and the incomplete surveys may be a result of survey fatigue as online surveys become an ever more popular method of research.

One of the major benefits of mixed methods is that it enables the triangulation and crosschecking of data (Tashakkori and Teddlie, 2010). With the crosschecking of data in this study, differences between stages occurred in few aspects of the study. Areas that differed included the reported use of coercive strategies, reported success in motivating patients and in the relationship between frustration and experience and or the completion of CPD. These differences may be due to social responsiveness bias or obsequiousness bias (Cook, 2010) or the fact that the focus groups allow for more in-depth thought and discussion on the subject which results in answers closer to current practice.

3.5 Conclusion

The aim of this study was to investigate the views and current practice of physiotherapists in relation to motivation and HBC. The results provide an indication of where the profession stands with regard to integrating evidence-based motivational interventions into practice and the up-skilling that is required. Dr. Nelson, the recipient of the 44th Mary McMillan Lecture Award from the American Physical Therapy Association, stated that to prepare for the next evolution in the profession, changes must be made in our educational system and in our professional associations (Nelson, 2013). The first area he discusses is communication and observing unique patient behaviours, the importance of which he states cannot be overemphasized. This was also the opinion of the participants of this study, with the importance of motivation and eliciting HBC in physiotherapy and the importance of education in this area clearly

evident. There is a paramount need for the provision of education in motivational interventions. A profession proficient in eliciting HBC and increasing adherence would improve patient outcomes, reduce therapist frustration and increase job satisfaction. To ensure the profession prospers and leads the way as Dr. Nelson advocates, there is a need to investigate the current education in this area. Education on its own is not the answer as barriers to implementing interventions were identified by study participants. It is therefore important to discover any potential barriers and facilitators to implementing motivational interventions as part of each patient contact.

Chapter 4. Study II Post-registration education evaluation

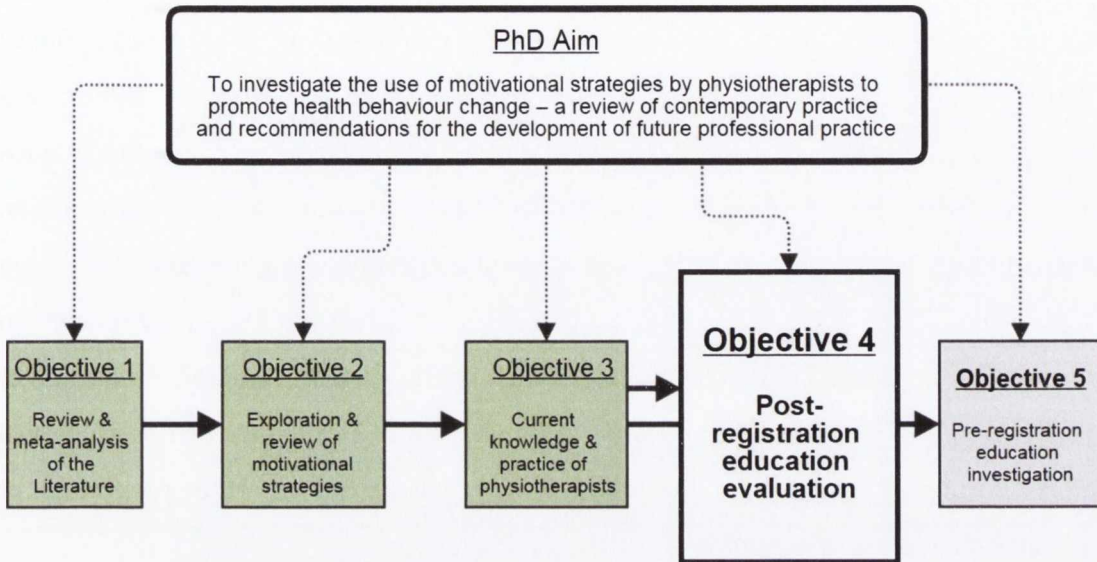


Figure 4.1 PhD flow chart

4.1 Introduction

This chapter will outline the methodology used to conduct the second study in this PhD and will report and discuss the findings of the study. This second study investigates the use of motivational interviewing (MI) among physiotherapists who have completed a 2-day level one MI course. The results of Chapter 3, which described levels of knowledge and methods currently employed by physiotherapists in optimising adherence and eliciting health behaviour change, indicated that motivational interventions are an important part of physiotherapy practice and that there is a need for the provision of education in this area of practice. The second study of this PhD aims to investigate current continuous professional development (CPD) education for practicing physiotherapists and to explore and identify barriers and facilitators to the implementation of MI into practice.

To the best of the author's knowledge there have been no previous studies of this nature in the physiotherapy profession. Studies investigating MI training and

implementation have been completed with other healthcare professionals (HCP) including physicians (Rubak, 2006), counsellors (Miller and Mount, 2001), addiction counsellors (Amodeo et al., 2011), nurses (Velasquez et al., 2000, Brobeck et al., 2011, Heaven et al., 2006), medical students (Bell and Cole, 2008, Poirier et al., 2004) and members of a cystic fibrosis multi-disciplinary team (MDT) (Duff, 2013). These studies reported the success of MI training and its implementation into practice. Barriers and facilitators to implementation of MI were identified for the various professions in each of the above studies. Although these studies are similar to each other and to this study, physiotherapy practice is unique and a study involving the education of and integration of MI into practice in the physiotherapy profession is necessary. This study follows on from the previous study in this PhD where it was shown education and the integration of motivational interventions are important and warranted. The results of this study will inform future CPD education in this area and will assist with the integration of motivational interventions into physiotherapy practice.

4.1.1 Aims and objectives

- To investigate the use of MI among physiotherapists who had completed a MI course.
- To investigate barriers and facilitators to the implementation of MI into practice for physiotherapists who had completed an MI course.

4.2 Methodology

4.2.1 Study design

Based on the study objectives, an embedded two-phase sequential mixed methods design with a qualitative descriptive approach was chosen. A quantitative stage involving two online surveys pre- and post-intervention were followed by a second, qualitative stage involving semi-structured interviews.

4.2.1.1 Study time-line

The first stage of this study involved the completion of two online surveys. The first was completed before a 2-day level one MI course with the second completed directly after the course. The second qualitative stage took place 3 months after the completion of the MI course and involved a semi-structured interview (Figure 4.2). A 3-month period was chosen as this length of time was perceived to be long enough to allow participants time to implement the new skills into practice while being short enough for barriers and facilitators to be fresh in the memory of participants, thereby allowing meaningful discussion. The same period of time has been used before to evaluate MI training of HCPs (Duff, 2013).

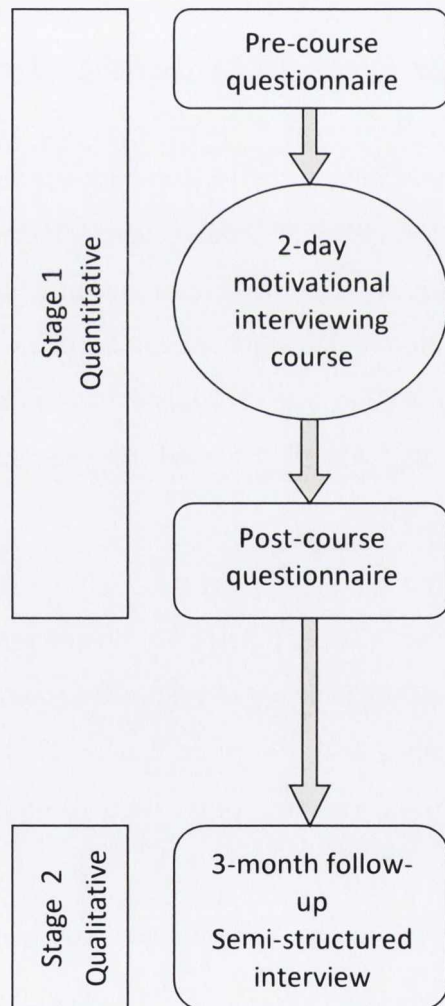


Figure 4.2 Study II design

4.2.2 Rationale for choice of research methodology

4.2.2.1 Intervention: two-day motivational interviewing course

The evidence for MI in the healthcare setting is extensive (Lundahl et al., 2010). MI was the most popular choice of CPD course among the sample of practising physiotherapists involved in Study I, as reported in section 3.3.2.4 in Chapter 3. MI courses are being funded by the Health Service Executive (HSE) and hosted by the Irish Society of Chartered Physiotherapists (ISCP). MI courses have also been conducted with the Irish Association of Speech and Language Therapists and the Association of Occupational Therapy of Ireland. These trends indicate that healthcare professionals and professional body of physiotherapists in Ireland have chosen MI as the most appropriate method for healthcare professionals.

A 2-day level one MI course was therefore chosen for this study. Permission to conduct research on two courses hosted by the ISCP and funded by the Health & Social Care Professions Education & Development unit of the HSE was sought and permission was granted by both organisations. These two specific course were selected for investigation for two reasons. Firstly physiotherapists from all clinical and practice areas would be invited as the course was open to all members of the ISCP. Secondly two courses were held over two separate weekends in January and February of 2014 in two different areas of the country, Dublin and Galway, which increased the geographical spread of participants.

The course was delivered by a qualified MI instructor, who is a member of the Motivational Interviewing Network of Trainers (MINT). The instructor, (JOS) (MA, Hdip, BSc, HG.Dip.P, RPN, RGN, MACI, MBACP), is an Accredited Psychotherapist, Addiction Counsellor, Nurse, Clinical Supervisor and Professional Trainer. He has worked in the Irish health and university sectors for nearly thirty years. He became a member of MINT in 2003.

JOS is an experienced trainer delivering training in MI, brief intervention and cognitive behavioural therapy (CBT) throughout Ireland for over a decade. In recent years JOS has tailored and delivered a series of workshops to members of the Irish Association of

Speech and Language Therapists, the Association of Occupational Therapy of Ireland and the ISCP. JOS has a special interest in Health Behaviour Change, Brief Intervention and addictions. He is co-author of the SAOR model of Brief Intervention (O'Shea and Goff, 2009).

The two-day MI course JOS delivered was tailored for physiotherapists and included pre-course reading, didactic learning in the form of Microsoft PowerPoint slides, DVD examples of aspects on MI in practice, group discussions and practical skills exercises. The content of the course covered the spirit of MI, MI core skills, MI strategies, an overview of transtheoretical model of behaviour change and challenges to the implementation of MI that physiotherapists may face and how to overcome them. The course outline is contained in Appendix 16.

4.2.2.2 *Mixed methodology*

As outlined previously in Chapter 3, research methodologies, broadly, are either quantitative or qualitative, the former being a numbers-based and the latter a word-based approach (Creswell and Tashakkori, 2007). Qualitative methods provide an insight into participants' perceptions of the topic and allow participants to respond in their own language. Qualitative methods can elicit information that cannot be obtained by quantitative methods (Tashakkori and Teddlie, 2010). Research into how physiotherapists practice is very much a study of human behaviour and as such a qualitative aspect to any investigation of it is crucial. The qualitative aspect of this study aims to provide insight into the use of MI in physiotherapy practice. The qualitative will also investigate barriers physiotherapists face and how they are overcome when integrating a new skill into clinical practice.

Mixed methodology, is frequently used in clinical research to improve the analytical power and to expand the scope of the research question (Sandelowski, 2000a, Borkan, 2004, Dein and Bhui, 2013). The central premise of mixed methodology is that the use of both methods provides a better understanding of the research question than either method could alone (Creswell and Clark, 2011). The use of mixed methods allows for both the exploration and identification of new and missing categories and the

subsequent testing of their relevance. Using both of these methods adds to the rigor of the data collected as they act as partial correctives to one another (Foss and Ellefsen, 2002). The use of both methods of data gathering allows for the triangulation of the data collected as information from one method can be crosschecked with the other (Tashakkori and Teddlie, 2010).

Mixed methodology involves the collection of both qualitative and quantitative data in a single study either concurrently or sequentially (Tashakkori and Teddlie, 2010). The method to best achieve the objectives of this study is an embedded sequential design, with quantitative stage a followed by a qualitative stage (Creswell and Clark, 2011).

4.2.2.3 Embedded design

The embedded design is a mixed methods approach where either quantitative or qualitative data are collected and analysed within a traditional quantitative or qualitative research design. This design is used to enhance the application of a traditional qualitative or quantitative study (Creswell and Clark, 2011). The collection of one data-set (qualitative or quantitative) can provide a supportive, secondary role in the study with the supplemental portion occurring before, during or after the primary portion (Creswell and Clark, 2011). There can be numerous reasons for choosing an embedded design.

This study was designed as a two-phase study embedding the collection of quantitative data in a qualitative study with a sequential approach. The first stage was quantitative, gathering data on pre-course expectations and post-course impressions and perceived benefits and was followed by a second qualitative stage to further understand the implementation on MI into physiotherapy practice. This design was chosen, as the primary aspect of the study (the qualitative element), was enhanced in several ways by the addition of a quantitative aspect. The quantitative stage was embedded in order to inform the design of the subsequent qualitative stage (Creswell and Clark, 2011). The quantitative stage was also helpful in improving initial recruitment to the overall study and to retain participants for the primary qualitative study, which occurred 3 months after the course (Creswell and Clark, 2011). With this design participants were recruited before the MI course took place. This was important as recruitment before the course

meant that any opinions regarding the course or the implementation of MI were not yet formed by participants. Attempting recruitment 3 months after the course could have adversely affected the sample size if only those who were enthusiastic about MI at that stage had volunteered. This could also have introduced a self-selection bias.

4.2.2.4 Qualitative descriptive approach

This is a descriptive study where first-hand knowledge of physiotherapists' experiences is sought. The goal was not to generate any theory, as in other qualitative approaches (e.g. grounded theory), but, rather, to describe physiotherapists' views and practice methods and to identify barriers and facilitators they faced when implementing MI into their practice. Qualitative descriptive studies focus on generating a comprehensive summary of events and are useful in providing a rich description of practice and experiences among HCPs (Sandelowski, 2000b, Sandelowski, 2010). It has been used in the investigation of physiotherapy practice in the past (Pashley et al., 2010, Stretton et al., 2013). Qualitative description is the method of choice when straightforward description is the study goal and is therefore the ideal approach for this study.

The pertinent features underlying the qualitative descriptive approach guided the design, analysis and reporting of this study. They are purposive sampling, semi-structured interview schedule with open-ended questions, content data-analysis and descriptive results close to the data-set (Sandelowski, 2000b, Neergaard et al., 2009).

4.2.2.5 Quantitative stage: two online surveys

To complete the quantitative stage of this study, two online surveys were chosen as the most appropriate method. One survey was completed before the course and the second immediately after the course. Data was gathered on pre-course expectations and post-course impressions and perceived benefits. The use of online surveys is justified based on the embedded design of this study, topics covered, respondents, recruitment method and cost. Online surveys provide the researcher with complete control over respondent selection, by targeting specific respondents, and data gathering (de Leeuw et al., 2012). The ease at which the survey is completed, the sequence in which questions are read and answered, preventing respondents from reading ahead, mandatory questions and

keeping the cost low and controlled is ensured (de Leeuw et al., 2012, Wyatt, 2000). They are appropriate when the targeted population is well represented on the internet and for covering a wide geographical area, as was the case with this study with courses taking place in Dublin and Galway (de Leeuw et al., 2012). The validity of online surveys has been checked in several studies with data obtained online comparable to data obtained by classical methods (Eysenbach and Wyatt, 2002).

4.2.2.6 Qualitative stage: semi-structured interviews

To complete the qualitative stage of this study, investigating practice and implementation of MI, detailed semi-structured interviews were undertaken as the chosen methodology. A potential alternative approach considered was direct or indirect observation of participants. Observation would not, however, have been sufficiently comprehensive to realise the aims of the study for several reasons. Data on participants' thoughts, views and opinions over a 3 month period, so important for gaining insight into practice, would not have been collected. Observation of practice of multiple participants would have greatly limited the potential size of the study. There would also have been difficulties recruiting for a study of this nature given consent and confidentiality issues for both participants and their patients (Mason, 2002). Additionally, participants under scrutiny are likely to change their behaviour while being directly or indirectly observed ('The Hawthorne Effect'), which would have reduced the reliability of the results (Roethlisberger et al., 1939). Qualitative interviews, however, are well recognised as suitable research methods for this type of study and are the most popular form of data collection in qualitative research (Mason, 2002). Qualitative interviews are used when the researcher wishes to gain an understanding of how participants view, experience or conceptualise a subject (Bourgeault et al., 2010, Neale, 2009). The use of qualitative interviews are appropriate when the researcher has a focus on specific research interests (Bourgeault et al., 2010). Interviews that are semi-structured can generate new knowledge and ideas as interviewees explore avenues of thought that they or the researcher have not previously considered (Neale, 2009). Semi-structured interviews form an inductive approach and it is therefore difficult to pre-define

questions that need to be asked (Neale, 2009). Questions are therefore fluid and flexible allowing the development of unexpected themes (Mason, 2002).

4.2.3 Study procedure

4.2.3.1 Ethical approval

Ethical approval for this study was granted from the Faculty of Health Sciences Research Committee, Trinity College Dublin (Appendix 17).

4.2.3.2 Participant selection and recruitment

A method of criterion purposeful sampling was chosen for this study (Creswell, 2012). All physiotherapists who met the same criterion, who were enrolled in one of two MI courses hosted by the ISCP, were eligible for this study. This method of recruitment is in line with the qualitative design and enhances the rigor of the study (Milne and Oberle, 2005).

The Professional Development Co-ordinator of the ISCP acted as gate-keeper. An invitation email (Appendix 18) containing the participant information leaflet (Appendix 19), a link to the pre-course questionnaire (Appendix 20) and an informed consent form (Appendix 21) was sent by the Professional Development Co-ordinator of the ISCP to each physiotherapist enrolled in the course. Potential participants were only contacted after they had secured a place on the course. This method of recruitment was chosen as it is the most appropriate way to target the physiotherapists enrolled in both courses who were spread over a wide geographical area. Recruitment took place before the courses started as participants would be more favourable to volunteering for the study and would be more amenable to completing online questionnaires before they took part in the course, compared to being contacted three months after the course. A link to the post-course questionnaire was emailed to participants following the course (Appendix 22). Three months after the course, semi-structured interviews were scheduled via email. Participants were given the option of completing the interview over the phone or in person at a time and in a location of their choice. Participants were contacted up to three times via email to arrange an interview. Those who failed to respond to any of the three emails were not contacted again.

4.2.3.3 Development of the pre- and post-course questionnaires

The pre- and post-course questionnaires were devised based on the study objectives listed in section 4.1.1 and the study design (section 4.2.2.2). An introductory explanation, stating the purpose of the study, providing contact details and assuring confidentiality of responses was included at the beginning of the pre-course questionnaire (Abramson and Abramson, 2011). Question design included the following; open-ended questions, multiple choice with and without multiple answers and questions using Likert scales. The survey was hosted on www.surveymonkey.com which ensured that the questionnaire, questions and the response options were visually identical for every potential respondent no matter which web browser or device they used to open the survey (de Leeuw et al., 2012). Data on demographics, pre-course expectations and post-course impressions and confidence in utilising the newly learned skills were collected. Both questionnaires were kept short to encourage participants to partake in the research. The pre- and post-course questionnaires are contained in Appendix 20 and 22.

4.2.3.4 Development of the interview schedules

The literature on qualitative description guided the construction of the interview schedule (Neergaard et al., 2009, Sandelowski, 2000b, Sandelowski, 2010, Milne and Oberle, 2005, Magilvy and Thomas, 2009). Semi-structured interviews with open-ended questions are the recommended format for a qualitative descriptive study (Neergaard et al., 2009, Magilvy and Thomas, 2009). Questions were designed to be simple, open-ended, flexible and situational rather than abstract (Mason, 2002, Sandelowski, 2000b). They were directed towards discovering the who, what, where and how of events and experiences (Sandelowski, 2000b). This allows participants to tell their own story in their own way and prevents a structure being put on answers. Trust between the researcher and the participants is developed with this questioning style (Milne and Oberle, 2005). Additional questions designed to probe for more depth and guide the interview towards fuller exploration were included in the schedule, to be used if deemed necessary (Mason, 2002). A simple question was posed to begin each interview and a summarising question, asking each interviewee if they had anything to add, closed each interview

(Mason, 2002). This made each interviewee comfortable at the start of the interview and incorporated respondent validation in the final question. The sequencing of questions was kept flexible allowing for the sequence of topics to follow the flow of each particular interview (Mason, 2002). The study objectives listed in section 4.1.1 and the information provided in the pre- and post-course questionnaires were used to guide the development of the questions and individualisation of each interview. A study evaluating the long-term effect on practice of an MI course with a cystic fibrosis MDT also used semi-structured interviews. The interview schedule used by Duff et al (2013) was provided by the author and was used to guide the development of questions in this study. The interview schedules began with introductory questions, proceeded with questions on frequency of use, confidence in the use of MI, the effect the course had on practice and ended with closing questions. A generic interview schedule is contained in Appendix 23.

4.2.3.5 Procedural aspects of the study

Participants who completed the pre-course questionnaire were sent a link to the post-course questionnaire the first working day after the course. Individual interviews were arranged via email 10 weeks after the course and were completed 11 to 13 weeks after the course depending on participants' schedules. All participants elected to complete the interviews by phone. The interview procedure, interview recording and interview confidentiality were explained to each participant at the beginning of the phone conversation and each participant was thanked for their participation. Each participant was sent a copy of their interview transcript within 10 days of the interview to complete respondent validation. They were requested to review the conversation and comment on the accuracy of the data. An opportunity to add to or dispute the content of the transcripts was provided.

4.2.3.6 Confidentiality

To ensure confidentiality each participant was assigned a study code for the duration of the study. All names and other details that could possibly identify participants were removed from the data. Study codes were only meaningful to the researcher (NMG). All data was saved on limited access, username and password protected computer files. All

written documentation was held in secure filing cabinets in a locked office. Access to the data was limited to the researcher (NMG).

4.2.4 Data analysis

4.2.4.1 Quantitative data analysis

The completed online surveys were password protected and were accessible only to NMG and the study supervisors. The responses were downloaded into Microsoft Office Excel 2007, SPSS (Windows version 20) and QSR Nvivo 10. Descriptive statistics were used to examine respondent demographic and workplace characteristics. Open-ended questions and comment boxes were analysed using thematic analysis (Braun and Clarke, 2006), word frequency counts and word searches. Word searches and frequency counts included synonyms and stemmed words. Word searches and frequency counts are used to effectively communicate the frequency of occurrence of some feature in the text and can be used to identify relationships (Miles and Huberman, 1994). Word frequencies can be indicative of the relative importance of emergent themes (Tashakkori and Teddlie, 2010).

4.2.4.2 Qualitative data analysis

All of the interviews were audio-recorded. All recorded data was listened to once and then transcribed verbatim by the researcher (NMG). Accurate transcription was ensured by listening to the recordings while re-reading the transcripts. Any typographical errors or omissions were corrected, enhancing rigor and credibility (Milne and Oberle, 2005). Any extra information, thoughts or corrections provided by participants during the respondent validation were added to the data. A total of seven participants responded to the respondent validation emails with three participants adding information to their data. All names and any other details that could identify participants were removed. Over 43,500 words of original content was transcribed.

Thematic content analysis as described by Braun and Clark (2006) was used for analysis of the transcripts and is described in detail in Chapter 3. This form of analysis was chosen as it is not associated to any pre-existing theoretical framework. It can be a realist method, which reports experiences, meanings and the reality of participants

(Braun and Clarke, 2006). An inductive approach was chosen, in which the themes are strongly linked to the data (Braun and Clarke, 2006, Pope et al., 2000). Themes were identified at the semantic level where themes are identified within the explicit meanings and analysis does not look beyond what the participant has said (Braun and Clarke, 2006). An inductive semantic approach to thematic analysis is therefore the ideal analysis for this study. This process involves six phases detailed in Table 4.1. The first phase occurred during data collection and data preparation. Notes on initial ideas for themes and codes produced during these phases informed the early stages of analysis (Braun and Clarke, 2006).

Phases of thematic analysis	
1. Familiarisation with the data	Transcribing interviews, reading and re-reading data, noting down initial ideas.
2. Generating initial codes	Systematic coding of the data across the entire data-set, collating data relevant to each code.
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes	Checking the themes work in relation to the coded extracts and the entire data-set.
5. Defining and naming themes	Generating clear definitions and names for each theme. Ongoing analysis to refine the specifics of each theme.
6. Producing the report	The final opportunity for analysis. Selection of extracts, final analysis of extracts, relating back to the research question and literature. Producing a scholarly report.

Table 4.1 Phases of thematic analysis (Braun and Clarke, 2006)

Initial codes were generated in the second phase. This initial list of codes was based on the objectives of the study and from familiarisation with the data. During this stage the interview transcripts underwent a process of content analysis and two rounds of coding. This involved reading and re-reading of the transcripts. Initially the transcripts were read in their entirety in order to get a sense of the whole. On the second reading NMG used line-by-line analysis to identify common sub-categories of code within the preliminary codes. This was the first round of coding and was completed systematically throughout

the entire data-set. The first version of the codebook was devised based on this basic content analysis. On the third reading, codes were assigned to the data, forming the second round of coding. The suitability of the coding system and the first version of the codebook was analysed by an independent researcher who checked approximately 20% of the coded data (JG). Due to the large amount of data a subset of 20% was used for verification of the codes and this was chosen based on the literature (Hruschka et al., 2004). Code suitability, potential themes and definitions were discussed and clarifications proposed.

During the third phase, the codes were sorted into potential themes and all the relevant coded extracts were collated within the identified themes. The codebook was then revised and modified. Codes and sub-codes were expanded if the codes did not adequately cover the theme, or collapsed if they were unwarranted. A second and final version of the codebook was then produced and the data re-coded with this new codebook.

In the fourth phase the themes were reviewed. The entire data-set was re-read to ascertain whether the themes were suitable for the data-set and to re-code any additional or missed data within the finalised themes. The finalised themes and sub-themes were refined, defined and named in the fifth phase. The final analysis occurred during the production of the results and the discussion of the findings.

4.2.4.3 Inter-rater and intra-rater reliability of the qualitative data

An investigation of inter-rater and intra-rater reliability of the coding system was carried out. To investigate the inter-rater reliability, an independent coder, previously unconnected to the study (CC), was provided with an un-coded copy of 20% of the transcript and asked to code it using the final codebook. This figure of 20% was considered acceptable based on the large amount of data and is in accordance with coding practices in the literature (Hruschka et al., 2004). All agreements and disagreements were counted to establish inter-rater reliability. Any disagreements between the initial coder (NMG) and the independent coder were discussed and resolved. The same 20% portion of the data was coded by the original researcher (NMG)

with a time interval of one month between initial and subsequent coding. The results were compared to establish the intra-rater reliability. The formula presented in Table 4.2 was used to calculate the reliability of the coding and is expressed as a percentage agreement (Miles and Huberman, 1994).

$\frac{\text{Number of agreements} \times 100}{\text{Total number of agreements} + \text{disagreements}}$

Table 4.2 Analysis of inter-rater and intra-rater reliability (Miles and Huberman, 1994)

4.3 Results

4.3.1 Demographic and workplace details of participants

A total of 35 physiotherapists were initially invited to take part. Twenty five completed the first stage of the study, both the pre- and post-course surveys. Stage one respondents' demographics and workplace characteristics are presented in Table 4.3. Nine participants reported working in more than one clinical area: private practice (n=3), primary care (n=4), out-patient departments (n=1) and in-patient care (n=1).

Six of the 25 initial participants failed to complete the second stage, the 3-month follow-up interview. Reasons for withdrawal were not provided as the six withdrawals were not contactable. The remaining (n=19) participants chose to complete their interviews over the telephone. The demographics and workplace characteristics of participants who completed stage two are presented in Table 4.4.

Stage 1 demographics		(n=25)	
Average Years Qualified		13	
Range Years Qualified		1-47	
Standard Deviation of Years Qualified		12.1	
		n=	%
Highest Qualification Achieved	Diploma	3	12
	Bachelor	17	68
	Higher Diploma (Post-graduate)	1	4
	Masters	3	12
	Doctoral (PhD)	1	4
Completed previous motivational intervention CPD course		6	24
Clinical area	Musculoskeletal	13	52
	Orthopaedics	5	20
	Rheumatology	3	12
	Gerontology	8	32
	Neurology	6	24
	Cardio-Respiratory	4	16
	Paediatrics	2	8
	Womens' Health	3	12
Practice area	Private Practice	3	12
	Outpatient Department	4	16
	Inpatient Care	4	16
	Primary Care	9	36
	Other	5	20

Table 4.3 Stage 1 respondents' demographics

Stage 2 demographics		(n=19)	
Average Years Qualified		14	
Range Years Qualified		1-47	
Standard Deviation of Years Qualified		12.1	
		n=	%
Highest Qualification Achieved	Diploma	2	10.5
	Bachelor	14	73.5
	Higher Diploma (Post-graduate)	1	5
	Masters	1	5
	Doctoral (PhD)	1	5
Completed motivational intervention CPD course		3	16
Clinical area	Musculoskeletal	9	47
	Orthopaedics	5	26
	Rheumatology	3	16
	Gerontology	6	32
	Neurology	5	26
	Respiratory	3	16
	Paediatrics	2	10.5
	Womens' Health	2	10.5
Practice area	Private Practice	4	21
	Outpatient Department	3	16
	Inpatient Care	3	16
	Primary Care	7	37
	Other	3	16

Table 4.4 Stage 2 participants' demographics

4.3.2 Quantitative results

4.3.2.1 Reasons for enrolling, expectations for the course and previous CPD

The main reasons provided by participants for enrolling in the course, in response to an open-ended question, were to improve practice by being more helpful to patients (n=9) and due to an interest in the area (n=8).

Participants responded to an open-ended question regarding their expectations for the course and two categories were identified in the answers: to increase understanding and knowledge of behaviour change (n=11) and to improve skills in eliciting behaviour change and improving adherence to physiotherapy (n=20). All participants who completed the post-course questionnaire reported that the course met their expectations (n=25).

Of the 25 participants who completed the pre-course questionnaire six had previously completed a motivational intervention CPD course. Two of these six participants had previously attended an MI course while two others had previously attended CBT based courses.

4.3.2.2 Patient suitability

The majority of participants 77.8% (n=21), believed that MI would be helpful to a particular type of patient. When asked in a follow-up question to provide details of the patient type, the majority of participants identified patients with chronic pain (n=12). Patients with chronic lifestyle-related conditions that require change, such as smoking, inactivity and obesity were identified by six participants as were patients who are difficult to communicate with, have lost hope, are anxious or are reluctant to change. Two participants thought MI would be helpful with all patients and two more believed that it would be beneficial for health promotion.

4.3.2.3 Knowledge, confidence and relevancy to practice

Overall perceived levels of knowledge improved directly after the course (Figure 4.3). The identical question, which was asked in the post-course questionnaire, was put to participants during their interview. Only one participant (of the 19 who completed the 3-

month follow-up interviews) reported a change in knowledge levels at 3-months with the change in knowledge reported as increasing from good to very good.

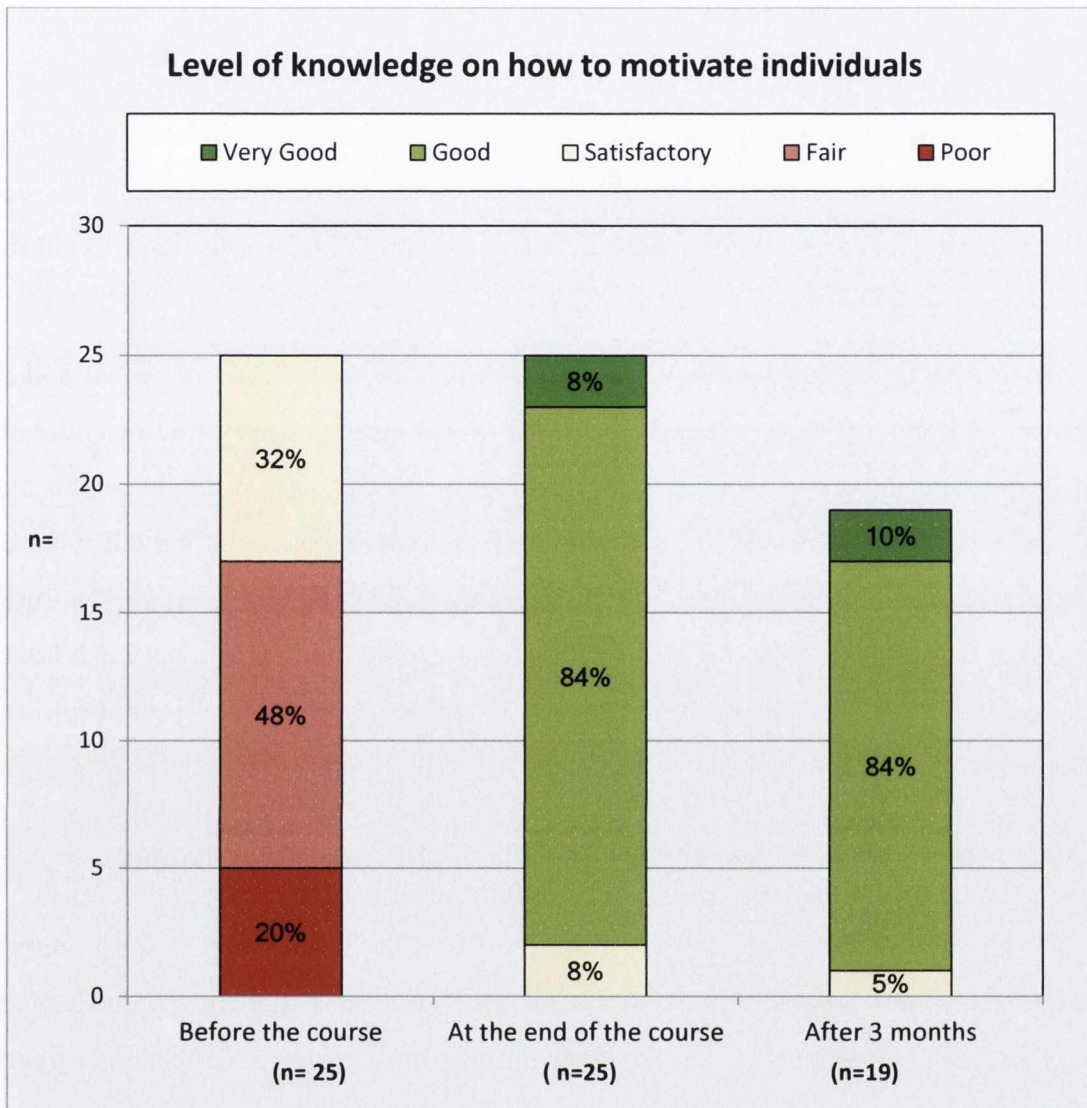


Figure 4.3 Knowledge levels of MI pre-course, post-course and at 3-month follow-up

All respondents agreed (n=13) or strongly agreed (n=12) after having attended the course that it was relevant to their practice. Only one participant changed their opinion on this at 3 months, changing from strongly agree to agree. This change, they explained, was due to the fact that they had changed clinical areas. They clarified that they still strongly agreed that it was relevant to the physiotherapy profession. Two participants were unsure if MI techniques would improve their practice while the rest agreed (n=10)

or strongly agreed (n=13) that it would improve their practice. These opinions did not change at 3 months when asked the same question during the interview.

Confidence levels in the ability to use MI techniques were high, with 20 participants agreeing that they were confident in their ability to use the knowledge and skills they learned on the course and two strongly agreeing. Only one participant disagreed with this statement and a further two reported neutral confidence. At the 3-month follow-up four participants reported an increase in confidence when the same question was put to them during the interview.

Four participants thought that these techniques would be difficult to implement and a further five were unsure as reported in the post-course questionnaire. The remainder of the participants disagreed (n=14) or strongly disagreed (n=2) that they would be difficult to implement. One participant, who agreed that implementation would be difficult, no longer held that opinion at the 3-month follow-up, while the five who were unsure remained so after 3 months. One participant who disagreed that it would not be difficult to implement MI techniques after the course agreed that they were difficult to implement after 3 months.

4.3.2.4 Attending a second course, discussing the course with colleagues, recommending the course to colleagues and course changes

When asked if participants would attend another MI course in the post-course questionnaire only one participant disagreed that it was likely that they would attend another course and another participant was unsure. The remaining participants agreed (n=15) or strongly agreed (n=8) that it was likely that they would attend another course. At 3-months follow-up when this same question was put to participants the unsure participant now thought it likely that they would attend another course. The participant who did not believe they would attend another course was of the same opinion at the 3-month follow-up while the remainder thought it likely (n=10) or very likely (n=8) that they would attend another course.

When participants were asked in the post-course questionnaire if they would discuss the course with colleagues all agreed that they would. Fourteen participants reported the intention to discuss it informally while eleven reported the intention to discuss it

formally, such as during time set aside for education. At the 3-month follow-up, 5 participants who had the intention of discussing it formally with colleagues had not done so. One of these 5 participants had discussed it informally. The four who had not discussed it formally were still planning on providing in-service presentations about MI, but had yet to do so for various reasons beyond their control. Only one participant who intended to discuss it informally had not done so and the reason they gave was that they had no colleagues in their place of work. One participant who had intended discussing it informally had provided an in-service on MI within 3 months of the course.

All but one participant reported that they would recommend this course to their colleagues in the post-course questionnaire. Of the 19 participants who completed the 3-month follow-up none had changed their opinion on this.

No participant left a response to the open-ended question regarding changes they would like to the course.

4.3.3 Qualitative results

4.3.3.1 *Inter-rater and intra-rater reliability of the interview data*

The method used to examine the reliability of the coding and the formula used to calculate the inter-rater and intra-rater reliability was described in Section 4.2.4.3. The results are presented in Table 4.5 and Table 4.6. When calculating the inter-rater reliability most discrepancies were errors of omission, where one or the other coder overlooked text that could be coded. All disagreements that were not an error of omission were resolved through discussion.

$$\frac{\text{Number of agreements} \times 100}{\text{Total number of agreement} + \text{disagreements}}$$
$$= \frac{163 \times 100}{163 + 22}$$
$$= 88.1\%$$

Table 4.5 Inter-rater reliability of the interview coding system (Miles and Huberman, 1994)

$$\begin{aligned}
 & \frac{\text{Number of agreements} \times 100}{\text{Total number of agreement} + \text{disagreements}} \\
 & = \frac{180 \times 100}{180 + 12} \\
 & = 93.75\%
 \end{aligned}$$

Table 4.6 Intra-rater reliability of the interview coding system (Miles and Huberman, 1994)

It is common to expect that inter-rater reliability be $\geq 70\%$ (Miles and Huberman, 1994) while others suggest it should be as high as 80% to 90% by the final round of coding (Hruschka et al., 2004). The accepted value of intra-rater reliability of the coding system is $\geq 80\%$ (Miles and Huberman, 1994). The results shown above demonstrate the reliability, both inter-rater and intra-rater, of the coding system.

4.3.3.2 Themes and sub-themes

Four themes were identified from the analysis of the interview transcripts. This is described in Section 4.2.4.2. These themes and sub-themes are presented in Table 4.7

Themes	1. Barriers	2. Facilitators	3. Awareness of practice	4. Success
Sub-themes	<ul style="list-style-type: none"> • Time • Privacy • Lack of opportunity • Patient suitability • Mental effort to break old habits • Lack of support 	<ul style="list-style-type: none"> • Reviewing the material • Practise • Mindful to use MI • Patient suitability • Peer support • Non-clinical use • Refresher 	<ul style="list-style-type: none"> • Old practice methods • New practice methods • Previous use • Recognition of gap in practice 	<ul style="list-style-type: none"> • Success • Ongoing challenges

Table 4.7 Themes and sub-themes generated through interview analysis

4.3.3.3 Theme 1: Barriers

The first theme identified in the data was 'Barriers'. This theme was identified in discussions involving the use of MI skills and the effects using MI had on participants' practice. Several areas were identified that constitute barriers the participants face when implementing MI into their practice. This theme included six sub-themes.

The first sub-theme, 'Time' was mentioned by every participant. This included the extra time participants perceived MI took. Participants felt that they had to do some traditional physiotherapy, or hand-on techniques, as part of their treatment session and how including MI with this caused an extra time pressure.

"You can't do these techniques if you are pushed for time... it's really not a situation where you can rush somebody. So that would be one barrier, the time thing." [TCD08 – Palliative care physiotherapists with 4 years experience]

"We have patients booked in every half an hour and sometimes time to do the physio part and fitting in some of the motivational interviewing part you feel like you need to do something physical or re-assess something when you're in with the patient. It can be tough to try and fit that all in, in one session... time would probably be the major one for me." [TCD16 – Out-patient department physiotherapists with 5 years experience]

The second sub-theme was 'Privacy'. Many participants spoke of how they perceived that patients would not engage fully in the conversation if they perceive that they would be over-heard. This was common for participants working on the wards, in gyms or in curtained cubicles and was discussed by participants working in private practice, primary care, out-patient departments and hospital based in-patient practitioners. Participants also spoke of how they had recognised privacy as a barrier and had made changes to overcome it such as moving to a more private area when available or not discussing sensitive topics with patients until privacy was available.

"I feel it would make the patients themselves uncomfortable for me to start talking about their weight if they felt someone could be over hearing." [TCD08 – Palliative care physiotherapists with 4 years experience]

“It is a barrier... we do have a private treatment room in our department and invariably it’s available so if I did feel like I did need extra privacy, maybe not on that session but maybe in the next session I can book that treatment room and use that. So I suppose that barrier has been overcome for us but I do get that sense that privacy is an issue with patients.” [TCD14 – Out-patient department physiotherapist with 15 years experience]

The next sub-theme is ‘Lack of opportunity’. This sub-theme encompasses the lack of opportunity to practice or implement MI techniques. A lack of opportunity to practice MI skills was a barrier faced by participants working in different settings. It was mentioned by physiotherapists working in the hospital setting in out-patient departments and in-patient settings. It was also mentioned by physiotherapists working in primary care

“My opportunities are quite limited... as with any new skill you have to have the opportunities to practice to consolidate your technique and I’m finding that difficult because although I am using some of the techniques it’s in very short bursts and so your opportunities for consolidation are more limited.” [TCD06 – Primary care physiotherapist with 16 years experience]

“You know when you’re not doing it all the time as well you kind of forget a bit, it has been quite difficult to implement I’d have to admit.” [TCD09 – In-patient cardio-respiratory physiotherapist 21 years experience]

The next barrier identified was ‘Patient suitability’. This is linked to opportunity as participants felt that they can only implement MI with certain patients. This barrier was mentioned by physiotherapists working in the full range of settings, private practice, in- and out-patient departments and in primary care. Patient suitability included difficult patients who did not want to engage and those who did not require change.

“It’s been difficult with some of the patients that I have, it’s not always been appropriate.” [TCD08 – Palliative care physiotherapists with 4 years experience]

“Since the course I probably haven’t had the ideal clientele that you would work through the whole process” [TCD26 – Primary care physiotherapist with 8 years experience]

"I think I would be very cautious using Motivational Interviewing with somebody who has come in who is a quick fix, that is a 1 or 2 session person and they're gone." [TCD27 – Private practice physiotherapist with 12 years experience]

The next sub-theme was 'Mental effort to break old habits'. This sub-theme entailed how implementing a new skill and breaking old practice habits was mentally taxing and tiring. This was identified by participants working in in-patient and out-patient departments, private practices and in primary care.

"It took so much thought and energy... it's like any technique... it take a lot more effort to introduce it and then some days I might be really, really busy and I might think 'oh scrap that' and I'll just go back to maybe whatever the old methods were." [TCD14 – Out-patient department physiotherapist with 15 years experience]

"I think it certainly takes a lot more energy for the therapist. So I think in some cases you can put your energy into physically working on the client or doing Motivational Interviewing. I find it very hard to do both." [TCD27 – Private practice physiotherapist with 12 years experience]

"I think it's just that I slipped back into my old ways... I know that that is something that I'm inclined to do." [TCD01 – Private practice physiotherapist with 47 years experience]

"It's very easy to slip back into what you were doing before; you tend to forget about it." [TCD09 – In-patient cardio-respiratory physiotherapist 21 years experience]

The final barrier to be identified from the data was a lack of peer support, titled 'Lack of support'. This barrier was only mentioned by physiotherapists working in primary care and private practice who are often sole-practitioners working in isolation.

"I have been talking about it but I'm meeting a few blank stares I suppose. I think that people think that it is a little alternative." [TCD19 – Primary care physiotherapist with 18 years experience]

"I haven't had a lot of people to discuss it with." [TCD06 – Primary care physiotherapist with 16 years experience]

4.3.3.4 Theme 2: Facilitators

The second theme identified in the data was facilitators to implementing MI skills and techniques into practice. This theme was identified in discussions involving the use of MI skills and the effects using MI had on participants' practice. Several areas were identified that participants mentioned facilitated the implementation of MI into their practice. This theme was made up of seven sub-themes, the first of which was 'Reviewing the material'. This method of facilitating implementation was mentioned by physiotherapists working in all the setting included in the sample, hospital based in- and out-patient physiotherapists, private practice physiotherapists and primary care physiotherapists.

"You have to keep reviewing it, it keeps your mind on it rather than just forgetting about it and putting your certificate in your folder and getting on with the same stuff you were doing before." [TCD09 – In-patient cardio-respiratory physiotherapist 21 years experience]

"I did read over the course manual initially after the course and then I kind of left it and practiced for a couple of weeks and then went back and read it again and I suppose I picked up on a lot more extra points that I hadn't initially." [TCD14 – Out-patient department physiotherapist with 15 years experience]

The second sub-theme was 'Practise'. Participants spoke of how practicing MI skills and techniques with patients was a major way of improving their skills and confidence. Practicing MI skills was a facilitator for participants regardless of workplace setting or years of experience.

"I think it's just a case of practice, practice, practice and just develop the skill so it becomes more fluid in your everyday interactions with your patients." [TCD02 – research based physiotherapist with 1 year experience]

"I think with practice and more use of it, my skills are improving" [TCD24 – Primary care physiotherapist with 6 years experience]

The next sub-theme was 'Mindful to use MI'. This sub-theme included how participants spoke of the need to be conscious of using MI skills and techniques and how some used reminders. This method of facilitating the implementation of MI skills was mentioned by physiotherapists working in private practice, primary care and in out- and in-patient departments of hospitals.

"It's just remembering to bring in that approach at times." [TCD19 – Primary care physiotherapist with 18 years experience]

"I've got everything printed on 1 page that I want to use with patients. So that is what I look at frequently." [TCD18 – Primary care physiotherapist with 17 years experience]

A sub-theme that is both a facilitator and a barrier was 'Patient suitability'. Choosing appropriate patients to use MI skills and techniques on assists in implementing MI into practice. This facilitator was identified in the transcripts of 14 of the 19 participants with all of the workplace settings in the sample represented.

"It's always easier firstly if somebody is really keen on change." [TCD05 – Private practice physiotherapist with 5 years experience]

"If I know the patient is a particularly difficult one I definitely tune much more into the core skills I need to use." [TCD18 – Primary care physiotherapist with 17 years experience]

Support was identified as a facilitator while lack of support was identified as a barrier. This sub-theme was titled 'Peer support' and was identified in 17 of the 19 transcripts. Peer support took the form of informal discussions with colleagues, both colleagues who had taken an MI course and colleagues who had not. This sub-theme also included the provision of extra time from management and practicing MI skills and techniques with colleagues.

"One of my colleagues was on the course as well... We'd done a bit of discussion around it, which has been very helpful, getting her views on it and her ideas. Just to back up what you remember." [TCD09 – In-patient cardio-respiratory physiotherapist 21 years experience]

“It was our manager who really encouraged us to start using it so... if we need extra time or whatever we need to do to incorporate this into our clinic they are going to support that for us.” [TCD14 – Out-patient department physiotherapist with 15 years experience]

“It’s very helpful to practice amongst ourselves and its definitely beneficial particularly at the very, very early stages... it does help to have people, it always helps to have people that you can bounce ideas off. It’s a huge benefit.” [TCD16 – Out-patient department physiotherapists with 5 years experience]

A sub-theme arose out of participants practicing MI skills and techniques on their friends, colleagues and family. This sub-theme was titled ‘Non-clinical use’. This non-clinical practice was reported by hospital based, out and in-patient physiotherapists and by physiotherapists working in private practice and primary care.

“Saying to friends and colleagues if they would let me practice on them, I would really love that opportunity because I see it as a way of developing my skills.” [TCD06 – Primary care physiotherapist with 16 years experience]

“Not just professional, personally I’ve certainly used it as well. It’s made me a more well-rounded physio.” [TCD14 – Out-patient department physiotherapist with 15 years experience]

The final facilitator identified by participants was the refresher course which took place 10 and 12 weeks after the courses. Only 6 participants who took part in the 3-month follow-up attended the refresher course. Reasons provided by participants for not attending the refresher course included scheduling conflicts, family bereavements, family commitments and that some participants did not want to travel to Dublin. Participants spoke of how the refresher course helped clarify issues, reinforced aspects of MI, increased their confidence and encouraged them to keep progressing with their skills. Participants discovered that other course participants were experiencing similar implementation issues and provided them with additional peer support.

"We had the refresher course 3 weeks ago and that was just good to cement certain issues that may have come up." [TCD05 – Private practice physiotherapist with 5 years experience]

"I found the refresher day really helpful. It was so helpful to reinforce what you knew and to encourage you to continue with your practice." [TCD06 – Primary care physiotherapist with 16 years experience]

4.3.3.5 Theme 3: Awareness of practice

A result of participating in the course was that participants reflected on their own practice. This reflection brought about an awareness of their practice methods from before the course and how the course had changed these methods. This reflection and awareness of practice methods was identified in the data as the third theme. This theme included four sub-themes.

The first sub-theme was an awareness of 'Old practice methods'. Old practice methods that are contradictory to MI techniques were identified by participants working in hospitals, in- and out-patient departments, private practice and primary care. The course prompted a reflection on previous methods and participants spoke of how they were unaware that what they were doing was ineffective and contradictory to best-practice. This awareness of old practice methods did not depend on years of experience as this sub-theme was identified in the transcripts of both novice and experienced therapists.

"I didn't realise that my style was somewhat directive before (the course)" [TCD01 – Private practice physiotherapist with 47 years experience]

"I didn't really realise until I went on the course that our approach can often be to tell people what to do... I didn't realise that my approach was like that." [TCD05 – Private practice physiotherapist with 5 years experience]

"I would have been very suggestive... some people suggest some people strongly tell or whatever and that just doesn't work. We know it doesn't work." [TCD12 – Private practice physiotherapists with 10 years experience]

"In the past I was very prescriptive. I was very motivated and I felt like I was going to pass my motivation onto the patients but in reality that wasn't maybe the best method or approach to take." [TCD14 – Out-patient department physiotherapist with 15 years experience]

The reflections on practice methods prompted by the course brought about an awareness of the use of more appropriate methods of motivating patients for physiotherapy and eliciting HBC. These methods included reflective listening, affirmations, providing choices, being more patient focused, collaborative discussions and goal setting, and allowing patients to reach their own conclusions. This awareness of new practice methods was identified in the transcripts of 13 of the participants who work in hospitals (in- and out-patients departments), private practice and primary care. This data completed the second sub-theme, awareness of 'New practice methods'.

"I've learnt to listen a lot more to people when I'm treating them... I'm able to pull myself back a lot more, which I wouldn't have done before hand... It's taught me to sit back a little bit more than I would have and let the patient guide the treatment." [TCD16 – Out-patient department physiotherapists with 5 years experience]

"I'm approaching them differently, like my whole conversation is patient focused, I'm winning them over." [TCD18 – Primary care physiotherapist with 17 years experience]

"I do think my questioning style has changed... there is a difference now in my head between getting info for a database and getting info for allowing them, or empowering them to contribute more to their programme and their management." [TCD22 – In-patient physiotherapist with 13 years experience]

Participants, from all the workplace settings represented in the sample, reported using MI skills and techniques before the course. Some participants were not aware that they were practicing in a manner similar MI or that they had already been using MI skills and techniques. Completing the course had consolidated these skills and increased their confidence in their use. This sub-theme was titled 'Previous use'. Prior use of MI skills and techniques did not depend on years of experience as novice physiotherapists with only 1 year of experience and physiotherapists who had been practicing for decade

report previous use of MI skills. All workplaces were also represented by those who reported prior use of skills.

"I already had the mind-set of taking a step back yourself from feeling responsibility for the outcome and feeling that the importance of empowering the client and engaging the client in therapy journey." [TCD06 – Primary care physiotherapist with 16 years experience]

So yeah definitely my confidence is improving cause now I kind of know for sure even though I did know myself, I felt like it was the right thing but it's just nice to have that, kind of, I suppose... What's the word I'm looking for? Reassurance I suppose. [TCD12 – Private practice physiotherapists with 10 years experience]

"I probably was using it but I wasn't aware of it in the past and I suppose it's just made me more aware of it." [TCD14 – Out-patient department physiotherapist with 15 years experience]

The final sub-theme was the recognition of the gap in physiotherapy practice. This sub-theme included how participants recommended MI to colleagues and how it should be covered during entry-to-practice education. The gap in training and practice was discussed by the majority of participants (n=16). It was discussed by physiotherapists working in each of the workplace settings and by both novice and experienced therapists.

"To be honest I think it really is going to be a skill that you're going to require as a therapist rather than it being optional." [TCD06 – Primary care physiotherapist with 16 years experience]

"I think it's very valuable to have good handling skills but people skills and the ability to give information appropriately and receive it ... I think that is just as important." [TCD24 – Primary care physiotherapist with 6 years experience]

"it's definitely an area that we end up doing a fair bit of work in but perhaps don't have all the training and the background that would be beneficial." [TCD16 – Out-patient department physiotherapists with 5 years experience]

"I think that we are really well placed to do that with patients and I highly recommend that physiotherapists do that." [TCD08 – Palliative care physiotherapists with 4 years experience]

"One of the hardest things as a new grad coming out is not to take too much responsibility yourself for the outcome of the therapy and also to engage clients, so I think it would be really helpful if some component of this was covered in undergrad training." [TCD06 – Primary care physiotherapist with 16 years experience]

4.3.3.6 Theme 4: Success

The final theme identified detailed the success of participants in implementing MI skills and techniques. The theme encompassed two sub-themes, 'Success' and 'Ongoing challenges'. The success of increasing adherence and any impact on patients was addressed in each interview. Many participants spoke of individual success that stood out in their memory and were included in the first sub-theme 'Success'. Participants spoke of it being difficult to gauge their success, or that they were getting mixed results and that there were ongoing challenges to implementation. This made up the second sub theme, 'Ongoing challenges'. Of the two participants who had completed an MI course previously only one completed the follow-up interview. This participant reported both success and ongoing challenges.

The vast majority (n=18) of participants reported success in implementing MI into their practice. As almost all participants reported being successful, success was therefore not based on workplace, clinical area, experience or having attended the refresher course. This success was reported as an increase in confidence in using MI skills, how MI has made discussing difficult, uncomfortable or sensitive topics easier and individual success stories. Successful changes to practice methods varied from subtle changes, mainly for those who were practicing in this manner previously to more overtly obvious changes. This data made up the first sub-theme, 'Success'

"I feel now as I'm using it my confidence beginning to grow in my ability to use it."
[TCD14 – Out-patient department physiotherapist with 15 years experience]

“It’s definitely made it easier to approach certain subjects with the patients that before I would have found it very difficult to broach with them... it’s really improved the way I would speak with patients.” [TCD08 – Palliative care physiotherapists with 4 years experience]

“she chose the things that she found easy to take on board and the things she found most helpful and then she talked about how she was going to integrate them. So it’s worked really well for her” [TCD22 – In-patient physiotherapist with 13 years experience]

“I didn’t realise that I was actually using a lot of it before I went on the course and I didn’t know. I found it was working, what I was doing but then it was great to go on a course, going ‘this is actually definitely right’, what I was doing and there was more to learn...there was 50% I was doing and then there was extra stuff that I needed to improve on” [TCD12 – Private practice physiotherapist with 10 years experience]

“there is definitely a lot more structure in my thought process as a result of doing the course” [TCD27 – Private practice physiotherapists with 12 years experience]

Despite almost all participants reporting being successful there were also reports of ongoing challenges to implementing MI skills and techniques by just over half the sample (n=10). Those who reported ongoing challenges, therefore, also reported being successful. As with success ongoing challenges did not depend on experience, workplace setting, clinical area or attendance at the refresher course. Facing ongoing challenges did also not depend on attendance at the refresher course as four participants who reported ongoing challenges attended the refresher course. Challenges included difficulty in measuring success and difficulties changing practice.

“I just don’t know if I get results... It’s difficult to measure” [TCD21 – Out-patient department physiotherapist with 5 years experience]

I’m probably not being very effective just yet [TCD22 – In-patient physiotherapists with 13 years experience]

“I don’t think it’s changed my practice too much.” [TCD23 – In-patient physiotherapists with 1 year experience]

4.4 Discussion

The overall aim of this study was to explore the use of MI among physiotherapists after the completion of an MI course and to investigate barriers and facilitators to the implementation of MI into practice. To the author's knowledge this is the first study of its kind in physiotherapy. Comparisons, therefore to other studies in physiotherapy are limited. Similar studies have been performed with other HCPs, mainly counsellors, addiction counsellors and mental health professionals. It is in these professions where MI is most commonly used and therefore where most of the research has been conducted. The use of MI with physicians, nurses and allied health professionals is relatively new and little research has been undertaken.

The results of this study indicate that participants are confident in using MI, believe that it is relevant to their practice and have mostly been successful at implementing MI into practice. A variety of barriers and facilitators were identified by participants. The study sample included all the core areas of clinical practice, a wide range of workplaces and range of years of experience and qualifications. This was achieved in both stages (Table 4.3 & 4.4).

4.4.1 Reasons for enrolling, course expectations and patient suitability

The reasons provided by participants for enrolling in the course and the course expectations provided in the first phase of this study indicate that participants had some awareness of MI before enrolling in the course. This was expected as participants voluntarily enrolled in the course. The patients participants believed would most likely benefit from MI reflect the study sample, where participants work and the patients they treat. People with chronic pain are frequently seen in primary care and by musculoskeletal physiotherapists, who made up the majority of the sample. Difficult patients were also identified as a reason for enrolling in the course. This result is consistent with a study investigating the typology of the 'difficult patient' seen by private practitioners (Potter et al., 2003a). Participants in Potter et al (2003) identified

communication skills and behaviour modification techniques as the strategies that they would like to learn more about (Potter et al., 2003a).

Only two participants thought MI could benefit every patient while a further two believed that it would be beneficial for health promotion. This number is lower than expected considering recent research on the role of physiotherapists as health promoters. It has been reported that physiotherapists perceive health promotion to be within their scope of practice (Walkeden and Walker, 2014). A recent survey of Irish physiotherapists revealed that physiotherapists agree that health promotion is a fundamental part of physiotherapy and that all physiotherapists should promote a healthy lifestyle (McMahon and Connolly, 2013). In this survey respondents were asked to identify barriers to health promotion and a lack of health promotion training was identified as the third most frequent barrier (McMahon and Connolly, 2013). When the results of this recent survey are taken into consideration, coupled with the fact that participants volunteered for the MI course and had some awareness of MI, it is unexpectedly low that only four out of the 25 participants believed that MI would be helpful for all their patients and for health promotion.

4.4.2 Knowledge, confidence and attending a second course

As expected, knowledge levels improved directly after the course and remained the same at 3 months. Participants' confidence levels either stayed the same after 3 months or increased. These results are in line with current research on MI workshop training. Miller et al (2004) reported a significant difference in proficiency in MI practice behaviours immediately following a course (Miller et al., 2004). A review of 17 workshops (MI and others) reported an increase in self-reported confidence and knowledge among addiction treatment professionals (Walters et al., 2005). This review showed that clinical level or years of experience did not have a significant impact on skills acquisition, a result comparable to this study, and that brief training improved skills, improved the frequency of screening and improved the frequency of interventions in medical settings. No physiotherapists were however included in any of these workshops (Walters et al., 2005).

A study of nurses (Heaven et al., 2006) and another of counsellors (Miller and Mount, 2001) reported that participants tended to return to their baseline methods of practising and that new skills are not maintained after one course. To address this, the authors proposed that further intervention was necessary. Walters et al (2005) stated that high levels of confidence and the perception that one has learned a skill or technique, as reported in the two studies by Heaven et al (2006) and Miller and Mount (2001), may be a deterrent to pursuing further training. This was not the case in this study with all participants stating that it was likely or very likely that they would attend another course. This may be evidence of a self-selection bias in this study as participants may already be interested in this area and keen to pursue it further. Another possible reason, and one that participants mentioned during the interviews, was that an introduction to the topic made participants aware of how much more there is to learn.

4.4.3 Awareness of practice

All participants were of the opinion that MI was relevant to their practice directly after the course. After implementing MI over a 3-month period their opinions remained unchanged and participants had a heightened self-awareness of their practice methods. This self-awareness included an awareness of both old and new practice methods. It also included an awareness that some participants previously used MI techniques without specific training. Awareness of previous methods used also included methods at odds with the principles of MI such as informational and expert power to foster behaviour change. Informational power is the ability to bring about change through the resource of information and expert power is using what one knows, experience, reputation, credentials and or special skills or talents in the influence of individuals (Raven, 2008, Raven, 1992, Raven, 1965, French and Raven, 1959). Participants became aware of their use of, and the limitations of, these methods in fostering long-term behaviour change. Years of experience and where the participant worked did not have an impact on awareness. This is an interesting finding when compared to other similar studies. Miller and Mount (2001) reported that they were successful in increasing the frequency of MI practice behaviours in a group of counsellors after a 2-day MI workshop. However, they reported that MI practice behaviours were only added to previous methods (Miller and

Mount, 2001). As a result of this study they concluded that there was a need to suppress old habits (Miller and Mount, 2001). In another study conducted by the same authors 3 years later the opposite occurred and reflects the finding of this study (Miller et al., 2004). In this second study participants had an increase in MI practice behaviours and a substantial decrease in practice behaviours that are inconstant with MI. These conflicting results demonstrate the difficulty in changing practice methods.

Participants who were unaware that they were previously practicing MI techniques, as identified in the theme 'Awareness' and sub-theme 'Previous use' indicate that the implementation of MI skills may not be very arduous for members of the physiotherapy profession who may already be practising in this manner. Both novice and expert physiotherapists and therapists working in different clinical and workplaces reported this, indicating that experience and setting may not impact on implementation. This awareness of pre-course use of MI skills and techniques however, may indicate a self-selection bias in this study. It is natural that physiotherapists would attend a course on something that they are interested in or where they perceive a gap in their practice. This self-selection bias is therefore difficult to eliminate in a study of this nature.

Despite any difficulty in changing practice, participants recognised that a gap exists in the profession's current practice methods. It was a self-awareness of the gap in their own practice that led participants to seek out a course in motivational interventions. It was recognised that education was necessary to close this gap. For physiotherapy practice to evolve, the current methods of education in the physiotherapy profession must evolve. This evolution cannot be something only tackled at the entry-to practice level, it must occur throughout the profession. Physiotherapy students learn from qualified physiotherapists through observation, and other means, while on clinical placement. Qualified physiotherapists therefore play a vital role in the evolution of practice methods.

4.4.4 Barriers

The barriers reported by participants in this study can be divided into two categories, institutional and personal barriers. Institutional barriers, or workplace barriers, included time, lack of opportunity, patient suitability, lack of support and privacy. Personal barriers included mental effort and the difficulty in breaking old habits.

The most common barrier, identified by all of the participants, was time. This was both how time is limited in an individual session and how eliciting behaviour change is a long process, which may require several sessions. Nurses reported that behaviour change is a long-term process and patients cannot be rushed into it (Brobeck et al., 2011). There are no studies published investigating barriers physiotherapists face when implementing MI but time was reported as a barrier among nurses and social care workers, dentists, mental health professionals, physicians, dieticians and members of a cystic fibrosis MDT (Velasquez et al., 2000, Brobeck et al., 2011, Rosseel et al., 2011, Midboe et al., 2011, Whitehead et al., 2009b, Duff, 2013). Time has also been reported as a barrier to health promotion among hospital in-patient based physiotherapists (Walkeden and Walker, 2014). It has been reported as a common barrier for physiotherapists when implementing new evidence-based practice methods (Zidarov et al., 2013, Swinkels et al., 2011, Jette et al., 2003). In contrast to these results, a study including Danish general practitioners (GPs) reported that their participants found that MI was no more time consuming than traditional advice giving (Rubak, 2006). This result is dissimilar and may not be an appropriate comparison as the GPs had time set aside for advice giving and were not incorporating MI into their normal practice.

The lack of opportunity to implement MI and patient suitability acting as barriers go hand in hand. To have the chance to practice MI the practitioner must have a caseload that provides this opportunity. Some individuals are already motivated to change their behaviour or to fulfil their rehabilitation commitments, some individuals may refuse to change while others may not be ready for change. Respecting an individual's autonomy in these cases will curtail MI skills implementation opportunities. This finding is comparable to barriers reported in similar studies. Client characteristics were reported as a barrier among addiction counsellors (Amodeo et al., 2011), the opportunity to

practise was seen as a requirement to deepen knowledge of MI and to learn from mistakes in a study of nurses (Brobeck et al., 2011) and a lack of opportunity to practise was reported as a barrier among social care workers (Velasquez et al., 2000). With regards to physiotherapists Swinkels et al (2011) reported that patient characteristics were a barrier to the application of clinical instrument measures (Swinkels et al., 2011). Individual patients and the patient population was reported as a barrier by Jette et al (2003) to the use of evidence in practice among physiotherapists (Jette et al., 2003).

Lack of support within the workplace was identified as a barrier. This involved not being able to discuss MI techniques with colleagues and lack of support to overcome other barriers, such as time. Lack of colleague involvement was reported as a barrier among dieticians (Whitehead et al., 2009b) and dentists (Rosseel et al., 2011). This barrier was identified by physiotherapists working in private practice and primary care. These working environment are similar to many dentists in that they may work in a small practice and may not have many colleagues to interact with during their normal working week. A lack of peer support was also reported as a barrier in the implementation of evidence-based instrument measures among physiotherapists, specifically a lack of discussion and feedback (Swinkels et al., 2011). In contrast to lack of support, peer support was reported by participants in this study as a facilitator and was mentioned by physiotherapists working in all the workplace settings included in the study

The final institutional barrier identified in this study was privacy. Participants felt that they themselves or their patients would not broach a sensitive subject or that their patients would not open up and fully discuss their issue with them if they thought there was a chance that they could be overheard. This barrier has not been reported in the literature to date. This may be unique to physiotherapy as common settings for physiotherapy assessments and treatments included physiotherapy gyms, wards and cubicles where the only privacy is offered by curtains. It may not have been reported in the literature as many of the studies included mental health professionals, dentists and GPs who would have consultation rooms where privacy is guaranteed. Many participants had recognised this barrier early and had overcome it by booking private rooms if and when they were available.

Personal barriers identified how participants reported that applying an MI technique required a lot of mental effort and that was difficult to break old practice habits. Difficulty breaking old habits or the ease at which participants slipped back into them was also reported by similar studies. Nurses implementing MI reported that working with MI was demanding and that an effort must be made to avoid slipping back into the former practice of just giving advice (Brobeck et al., 2011). A similar result was reported by Amodeo et al (2011) with addiction counsellors who stated that it was easy for staff to slip from using the MI framework (Amodeo et al., 2011). Miller and Mount (2001) reported that there was a need to suppress old habits in their study of counsellors (Miller and Mount, 2001). Changing the daily routine was reported as difficult among physiotherapists using evidence-based clinical instrument measures (Swinkels et al., 2011). This personal barrier, coupled with the results from similar studies with other HCPs indicate that adopting motivational interventions is not straight forward. It requires sustained effort on behalf of individuals and the profession if it is to be successful.

4.4.5 Facilitators

Of the seven facilitators identified by participants five are linked to, and directly off-set barriers reported in this study. The main facilitator identified by participants was practise. To practise a new skill one must have the opportunity to do so, linking practise to lack of opportunity and patient suitability. Another facilitator to off-set the lack of opportunity and patient suitability is non-clinical use. Physiotherapists reported practising MI techniques with friends and colleagues, negating the lack of opportunity or the lack of suitable patients to practice on. Non-clinical use assisted them in increasing their confidence in using MI and assisted implementation of MI. Patient suitability was identified as both a barrier and as a facilitator and is linked with opportunity as discussed above. Peer support was seen as a facilitator, as participants could practice or discuss MI skills with their peers, while a lack of this support was identified as a barrier. Physiotherapists in a study by Jette et al (2003) received support from colleagues and therefore reported that lack of peer support was not a barrier to the use of evidence in practice (Jette et al., 2003). Finally, being mindful to use MI decreases the chance of

slipping back into old habits but may require mental effort to do so. The use of these facilitators does not depend on workplace setting or experience of the therapists as these facilitators were identified by novice and experienced therapists working in a range of settings.

Two facilitators were identified that were not linked to barriers. Reviewing the course material was a popular method of solidifying knowledge and is a well-known learning technique. The final facilitator was attending a half-day refresher course that was provided 10 or 12 weeks after the initial 2-day course. Further training or support is something that is widely reported in the MI literature as improving the implementation of MI practice. A review of workshop training reported that there is some evidence for a deterioration in skills if the workshops were not accompanied by additional consultation or support (Walters et al., 2005). This was also reported in a study investigating the effect of continued supervision among nurses following an MI course (Heaven et al., 2006). This study reported that positive outcomes such as effective learning, clear improvements in skills and motivation to change practice are not maintained unless some kind of follow-up intervention is offered (Heaven et al., 2006). The need for follow-up training is echoed by a second study involving nurses and one involving counsellors (Brobeck et al., 2011, Miller and Mount, 2001). Only six therapists who participated in the final stage of this study attended the refresher course. These six participants, however, did not differ from the rest of the sample in terms of reported success.

Facilitators mentioned in the literature not identified by participants in this study included that one must be convinced of the benefits of the new practice and have positive experiences with it before one will implement it (Swinkels et al., 2011, Nelson et al., 2006). Although this was not mentioned by participants in this study they did volunteer to partake in the course and therefore may already have believed in the benefits of MI. Another facilitator not mentioned by participants was that a prior interest in MI was required to avoid regressing to previous practice behaviours (Brobeck et al., 2011) and that prior passion and use of the skills make them easier to implement (Swinkels et al., 2011, Nelson et al., 2006). This was evident in participants' previous, sometimes unlabelled and unrecognised, use of MI skills.

4.4.6 Success

The results of this study indicate that physiotherapists perceived that they were successful in implementing MI skills and techniques into practice after attending a 2-day level one course. A total of 18 participants out of a possible 19 who completed the follow-up report some form of success. This is consistent with similar studies involving counsellors (Miller and Mount, 2001) addiction counsellors (Amodeo et al., 2011), nurses (Velasquez et al., 2000, Brobeck et al., 2011, Heaven et al., 2006), medical students (Poirier et al., 2004) members of a cystic fibrosis MDT (Duff, 2013) and GPs (Rubak, 2006). A review of 28 articles on a range of MI training methods, from a 2-hour video session to a 5-week course, reported success among a variety of HCPs, although no studies on physiotherapists were included (Madson et al., 2009). Participants who faced fewer barriers and had the opportunities and the caseload to practise reported more success than those who faced more barriers and did not have the opportunities and caseload to practise. Despite these positive results there were reports of ongoing challenges to the implementation of MI into practice from participants in this study even though only one of the ten participants who reported difficulties in implementation did not report any form of success. This one participant did not attend the refresher course. Ongoing challenges were reported by those who did and did not attend the refresher course, by those working in different settings and by therapists with varying years of experiences. It is also worth noting that the majority of those who reported ongoing-challenges also reported some form of success. It is therefore difficult to identify a reason for these ongoing challenges.

4.4.7 Implications for practice and education

To accelerate the implementation of evidence-based practices, barriers can provide guidance for action (Amodeo et al., 2011). The barriers identified by this study must be addressed to facilitate the implementation of MI into practice. Addressing institutional barriers may be difficult within the current healthcare environment with less time and increasing workloads. This may also be the case for personal barriers as adopting a new method of practice that requires sustained mental effort will be increasingly difficult

with the added pressures of less time and an increasing workload. Further training and supervision is required to ensure new skills and practice methods are maintained (Amodeo et al., 2011, Brobeck et al., 2011, Walters et al., 2005, Heaven et al., 2006, Miller and Mount, 2001). Peer support, supervision and feedback will become more frequent with increasing numbers of physiotherapists completing courses and becoming more familiar with MI methods therefore accelerating its implementation.

4.4.8 Limitations

This study has some limitations worth noting. Semi-structured interviews were used to explore the use of MI. This methodology is susceptible to researcher bias in the collection, analysis and interpretation of data (Neale, 2009). Self-assessment can be an unreliable indicator of actual practice behaviour, making it difficult to gauge if an MI style was established or if a directive style prevailed (Eva and Regehr, 2005, Miller and Mount, 2001). There are, however, few appropriate evaluation designs that accurately reflect skills acquisition. A more accurate method would be by direct observation and the use of the Motivational Interviewing Skills Code (MISC) or the Motivational Interviewing Treatment Integrity (MITI) scale, this method, however, was impractical and inappropriate for this study (Moyers et al., 2005). Participants were offered the option of completing the interview in person or over the phone. All chose the phone. Phone interviews limit the quality of data as non-verbal communication is unobtainable (Creswell, 2012).

A self-selection bias may be present as the study sample was recruited from physiotherapists who voluntarily enrolled in the MI courses. There is further evidence for this as eight participants enrolled in the course out of interest. The over-representation of both musculoskeletal physiotherapists and of physiotherapists working in primary care in this study may also be evidence of a self-selection bias. There was an under-representation of in-patient hospital based physiotherapists in both stages (Table 4.3 & 4.4). As a result the opinions of in-patient hospital based physiotherapists may not have been captured to the same extent and the barriers and facilitator they encounter may not have been thoroughly investigated. A non-response bias may be present as eight participants failed to complete the 3-month follow-up. One can only

speculate on the reasons for withdrawal as none were provided as there was no contact from these eight participants.

This study did not investigate the perspectives of clients or patients on the use of MI by their physiotherapist and no research has been published on this to date. Research into this aspect of the implementation of MI is warranted to obtain these views.

4.5 Conclusion

The implementation of evidence-based methods to motivate patients and to elicit health behaviour change within the physiotherapy profession is warranted as discussed in chapter 3. This study, the first of its nature, indicates that the current format of CPD in this area, a 2-day MI course is successful. MI can be successfully implemented into practice by both novice and experienced physiotherapists working in a range of practice and clinical areas.

Several barriers and facilitators have been identified that hinder and assist with implementation. Interventions targeting these barriers should be considered and facilitators should be encouraged and implemented to establish widespread use of MI within the profession.

Chapter 5. Study III Entry-to-practice education investigation

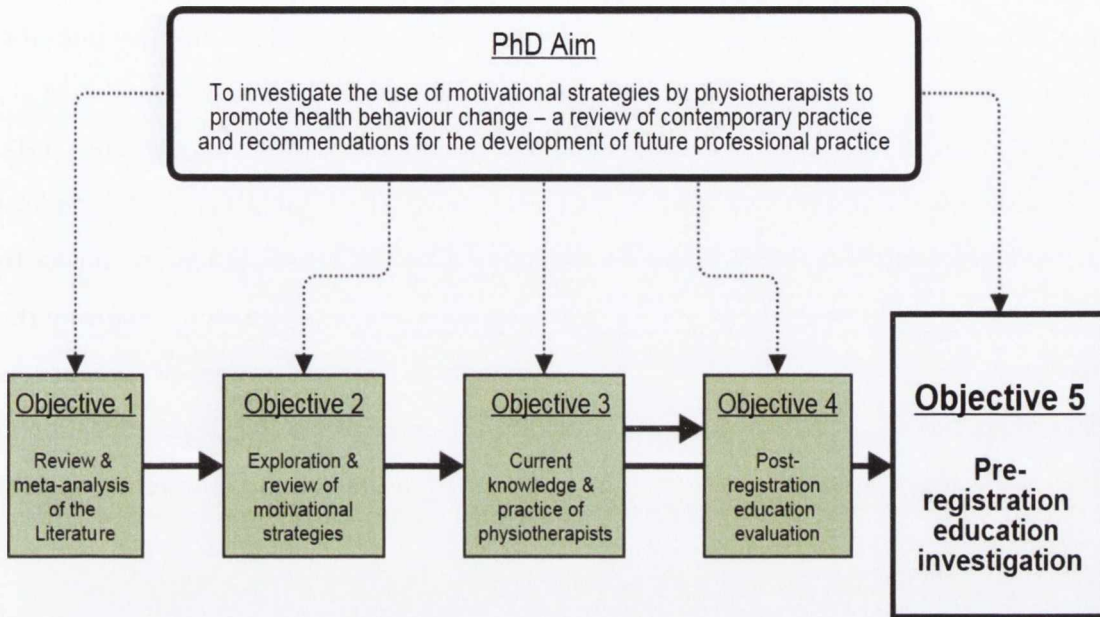


Figure 5.1 PhD Flow chart

5.1 Introduction

This chapter will outline the methodology used to conduct Study III of this PhD and will report and discuss the study's findings. This third study investigates the effectiveness of a level one motivational interviewing (MI) course for physiotherapy students at the entry-to-practice level of physiotherapy education. The results of Study I (Chapter 3) indicated that motivational interventions are an important part of physiotherapy practice and that education in this area of practice at the entry-to-practice level is warranted. This third study is similar to, and follows on from Study II, which was described and discussed in the previous chapter. Study II indicated that MI can be successfully implemented into physiotherapy practice after the completion of a 2-day level one MI course. There is a need to investigate if the same format of education can be successful at the entry-to-practice level. A similar study to Study II was therefore designed and carried out with the results of Study I and Study II guiding the design.

Barriers and facilitators to the implementation of MI into physiotherapy practice were identified in Study II and steps were taken in the design of this study to limit the effects of these barriers and the make use of the facilitators.

To the best of the author's knowledge there have been no previous studies of this nature among physiotherapy students. There have been studies investigating the implementation of MI among health care professionals (HCP) (Duff, 2013, Amodeo et al., 2011, Brobeck et al., 2011, Heaven et al., 2006, Rubak, 2006, Miller and Mount, 2001, Velasquez et al., 2000). Two studies, however, have been completed with medical students (Bell and Cole, 2008, Poirier et al., 2004). Although these studies are similar to each other and to this study, physiotherapy practice is unique and a study involving the education of physiotherapy students and integration of MI into their practice is necessary. The results of this study will inform future entry-to-practice level education in this area and will assist with the integration of motivational interventions into physiotherapy education and practice.

5.1.1 Aims and objectives

- To investigate student physiotherapists' knowledge of MI after completing a level one MI course.
- To investigate student physiotherapists' confidence in optimising adherence and eliciting health behaviour change after completing a level one MI course.
- To investigate the effects of completing a 6 week clinical placement directly after attending a level one MI course on student physiotherapists' knowledge of MI and their confidence in optimising adherence and eliciting health behaviour change.

5.2 Methodology

5.2.1 Study design

Based on the study objectives, an embedded mixed methods approach was chosen. This study took the form of a quantitative study with a repeated measure design. A supportive qualitative element was embedded during the final phase of data collection.

5.2.1.1 Study time-line

Data collection occurred at three separate time-points (Figure 5.2). Quantitative data was collected at all three time-points. The first time-point, prior to the commencement of the course, assessed participants' baseline knowledge of MI and confidence in eliciting health behaviour change and using MI. Data was collected using a questionnaire. The second time-point occurred directly after the course where participants completed the questionnaire again. Participants then completed a 6 week clinical placement where on-line resources were made available on Blackboard. The study terminated directly after completion of the clinical placement which was the final time-point. Both quantitative and qualitative data was collected at this final data collection time-point. Two forms of quantitative data was collected, questionnaire data and Blackboard usage data. Qualitative data was collected using reflective writing.

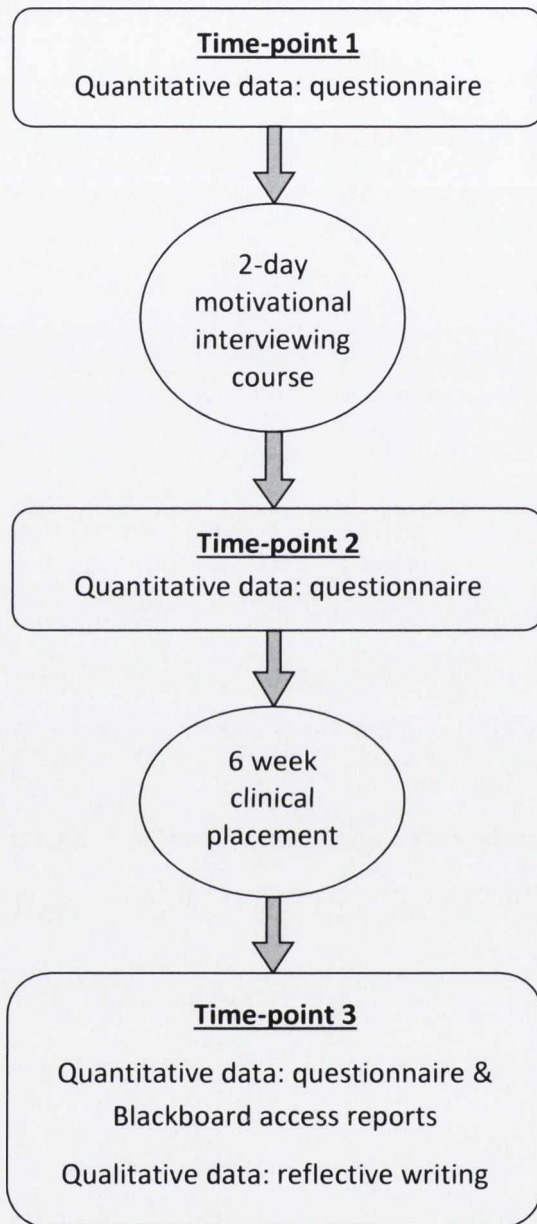


Figure 5.2 Study 3 design

5.2.2 Rationale for choice of research methodology

5.2.2.1 Intervention: two day motivational interviewing course

The evidence for MI in the healthcare setting is extensive (Lundahl et al., 2010). MI was the most popular choice of CPD course among the sample of practising physiotherapists involved in Study I, as reported in section 3.3.2.4 in Chapter 3. MI courses are being funded by the Health Service Executive (HSE) and hosted by the Irish Society of Chartered Physiotherapists (ISCP).

A 2-day level one MI course was chosen for this study. MI is the most popular choice for continuous professional development (CPD) courses among practising physiotherapists as reported in section 3.3.2.4 of Chapter 3. The evidence for MI in the healthcare setting is extensive (Lundahl et al., 2010) and courses are being funded by the Health Service Executive in Ireland and hosted by the Irish Society of Chartered Physiotherapists. MI courses have also been conducted with the Irish Association of Speech and Language Therapists and the Association of Occupational Therapy of Ireland. These trends indicate that healthcare professionals and professional body of physiotherapists in Ireland have chosen MI as the most appropriate method for healthcare professionals. The results of Study II indicate that the same 2-day level one MI course was successful among practicing physiotherapists (Chapter 4). The same course was chosen for this study to allow comparisons between practicing physiotherapists and student physiotherapists.

The course was the same as the course delivered in Study II (see Section 4.2.2.1) and was delivered by the same qualified MI instructor, JOS, who delivered the courses in Study II (see Section 4.2.2.1). Keeping the course and instructor consistent allows comparisons between Studies II and III.

5.2.2.2 Clinical placement and online supports

The MI course was deliberately scheduled 1 week before students began a 6 week clinical placement. The study was purposely designed and timed in this manner in order to provide students with an opportunity to practise MI skills immediately after the course while on clinical placement. This design is in accordance with the results of Study II where the opportunity to practise and consolidate the new skills was identified as a

facilitator to the implementation of MI into practice. Clinical tutors and practice educators at the clinical sites to which participants were allocated were informed of the study and of the students' participation. A copy of the Participant Information Leaflet, the questionnaire and the researcher's (NMG) contact details were made available to each site.

Participants were provided with access to online learning resources hosted on Blackboard. Blackboard is an e-learning software application used for the administration, documentation, tracking, reporting and delivery of education courses or training programmes. Students are familiar with Blackboard as it is a popular resource used throughout their degree course in a range of subjects. Students were provided with access to a discussion board, self-assessment resources (Appendix 24), stages of change resources (Appendix 25), MI resources (Appendix 26) and course notes. These resources were put in place in accordance with the results of Study II where reviewing course material was identified as a facilitator to the implementation of MI into practice. Web-based resources were mentioned as a potential facilitator of further MI learning by members of a cystic fibrosis MDT who underwent MI training (Duff, 2013). Peer-support was also identified as a facilitator, while lack of support was identified as a barrier to the implementation of MI into practice in Study II. Allocations of placements at each clinical site are limited. Students may therefore have few or no classmates with them while on placement and may not have the opportunity to discuss MI with their peers. The discussion board tool on Blackboard was made available to overcome this.

5.2.2.3 Mixed methodology

As outlined previously in Chapters 3 and 4, research methodologies, broadly, are either quantitative or qualitative (Creswell and Tashakkori, 2007). This study requires the use of both methodologies to collect data on knowledge of MI and confidence using MI and to collect data which may provide insight into student physiotherapists' perceptions and experiences using MI during their clinical placement.

The combined use of both of these data-gathering techniques, mixed methodology, is frequently used in clinical research to improve the analytical power and to expand the

scope of the research question (Sandelowski, 2000a, Borkan, 2004, Dein and Bhui, 2013). Mixed methodology provides a better understanding of the research question than either qualitative or quantitative methods could alone and adds to the rigor of the data collected through crosschecking and triangulation of the data (Creswell and Clark, 2011, Tashakkori and Teddlie, 2010, Foss and Ellefsen, 2002).

Mixed methodology involves the collection of qualitative and quantitative data in a single study either concurrently or sequentially (Tashakkori and Teddlie, 2010). The method to best achieve the objectives of this study is an embedded design, with a qualitative element embedded in the final stage of a quantitative repeated-measures design (Creswell and Clark, 2011).

5.2.2.4 Embedded design

The embedded design is a mixed methods approach where either quantitative or qualitative data are collected and analysed within a traditional quantitative or qualitative research design (Creswell and Clark, 2011). The collection of one data-set (qualitative or quantitative) can provide a supportive, secondary role in the study with the supplemental element occurring before, during or after the primary element (Creswell and Clark, 2011). There are many different ways of designing an embedded study and many reasons for choosing each design.

The design of this mixed methods study embeds the collection of qualitative data at the end of a quantitative study. This method was chosen to provide an enhanced understanding of the quantitative results (Creswell and Clark, 2011). The collection of qualitative data at the end of a quantitative study of this nature was used so that participants can describe their experiences with the intervention (Creswell and Clark, 2011).

5.2.2.5 Quantitative element: Questionnaire and Blackboard access data

To complete the quantitative element of this study, a questionnaire was chosen as the most appropriate method. This questionnaire was completed on three occasions; before the course, immediately after the course and upon completion of a 6 week clinical placement. Questionnaires have previously been used to assess MI knowledge and

confidence following MI training in studies involving health-care students (Bell and Cole, 2008, Poirier et al., 2004).

Data was collected on each participant's access to the online supports hosted on Blackboard at the completion of the study. Data was collected on the resources accessed, frequency of access, date of access and discussion board entries.

5.2.2.6 Qualitative stage: Reflective essays

To complete the qualitative element of this study reflective essays were chosen as the most appropriate method. Reflective writing, which is analysed and interpreted by the researcher, is a well-established data source in qualitative research (Jasper, 2005) and has previously been used as a primary data source in studies among health care professionals (Brady et al., 2002). Reflective essays were chosen as the most feasible option and the one that would least impact on final year students' time. Participating in interviews or focus groups involves a greater time commitment. Direct observation recordings or sessions would potentially put extra pressure on students, many who were sitting their final patient assessment during this placement.

5.2.3 Study procedure

5.2.3.1 Ethical approval

Ethical approval for this study was granted from the Faculty of Health Sciences Research Committee, Trinity College Dublin (Appendix 27).

5.2.3.2 Participant selection

A method of criterion purposeful sampling was chosen for this study (Creswell, 2012). All participants who met the same criterion, physiotherapy students who were enrolled in the Senior Sophistor physiotherapy class of 2014-2015 in Trinity College Dublin, were invited to participate. Senior Sophistor students were selected as they have already been exposed to patient-therapist interaction, having completed 21 weeks of clinical placement over 4 separate placements, and they are yet to complete their final two, 6 week clinical placements. This is in line with the results of Study I of this PhD (Chapter 3). It is also in line with previous research which has shown that students succeed best in

developing higher-order knowledge and skills when given multiple opportunities to practise what is learned (Diamond, 2009, Gardiner, 1996). Students assigned to the following clinical placements were excluded; intellectual disability and palliative care. The typical case-load assigned to students on these placements may not provide participants with the opportunities to practise what they have learned. For the use of MI with people with mild intellectual disability several modifications are recommended (Frielink and Embregts, 2013). For the purposes of this study, with student practitioners, who have only completed an introductory course the adaptation of MI for this setting was deemed unrealistic.

5.2.3.3 Recruitment procedure

The executive officer for the discipline of physiotherapy in Trinity College Dublin acted as gate-keeper. An invitation email (Appendix 28) containing details of the study, the participant information leaflet (Appendix 29) and an informed consent form (Appendix 30) were distributed to all Senior Sophistor students by the gatekeeper. Those who were interested were asked to contact the researcher (NMG). Placements assigned to students who contacted the researcher were checked to assess eligibility. Students who were assigned to an eligible placement and could attend the course had a place booked for them on the course and they were assigned a study code.

5.2.3.4 Development of the questionnaire

The questionnaire used was developed specifically for this study. Questions were taken from questionnaires used in similar studies in order to facilitate comparison with similar research (Duff, 2013, Bell and Cole, 2008, Poirier et al., 2004). Question wording or structure was modified if necessary to reflect the study population. The adaptation of questions occurred after the questionnaire was piloted. Five physiotherapists and ten post-graduate physiotherapy students unconnected with the study piloted the questionnaire for clarity, wording and question flow. Minor changes were made to the questions and to the questionnaire at this stage based on the piloting. The questionnaire included a total of twenty questions. A study evaluating MI training in a cystic fibrosis MDT (Duff, 2013) provided four questions, all of which were modified. Two studies evaluating MI training with medical students (Bell and Cole, 2008, Poirier et al., 2004)

provided fifteen questions, eight from Bell and Cole (2008) and seven questions from Poirier et al (2004). Two of the questions from Bell and Cole (2008) were modified and one from Poirier (2004) was modified. Study authors were contacted if their published material did not include the questionnaires they used. The final question, a physiotherapy specific question, was designed by the author (NMG).

The questionnaire included thirteen questions assessing confidence, six knowledge questions and one opinion question. Question design included the following; multiple choice, true or false, listing question and Likert scale. A copy of the questionnaire is contained in Appendix 31.

5.2.3.5 Procedural aspects of the study

At the outset of the study, participants were posted a pack which included an instruction letter (Appendix 32), informed consent form, questionnaire, demographics document (Appendix 33) and a stamped addressed envelope for returning the forms. Participants were asked not to research any answers prior to completing the questionnaire. When the documents were returned to the researcher (NMG) the pre-course reading was emailed to each participant. Participants attended the 2-day course 7 days prior to beginning their clinical placements. The course took place in a classroom familiar to the students in the Trinity Centre for Health Sciences. At the end of the course the questionnaire was completed by participants for the second time. Participants were emailed during the final week of their clinical placements to confirm their address (for sending the questionnaire) and to instruct them on their reflective essays.

Students were asked to retrospectively reflect on their use of MI during their placement. A word limit of approximately 600 word was set. The word limit was set in order to limit the amount of time student spent on their essays as participants are final year students. Students were asked to be as honest as possible and were reminded that this essay was not a test, that there were no right or wrong answers and that un-coded essays would not be shared with anyone but the author (NMG). They were instructed that all points were valid and valuable. Instructions provided asked the students to comment on if the MI course changed/did not change their practice, specifically their communication style, goals setting with their patients, prescriptions and advice. They were also instructed to

comment on anything that aided or hindered the implementation of MI skills. Finally students were asked to comment on whether they thought attending the course had any effect on their patients' communication and adherence.

The questionnaire was posted on the final Friday of the students' placement. Participants were instructed to complete the questionnaire for the third and final time and return it along with their reflective essays in the provided stamped addressed envelope. Blackboard usage data was downloaded from Blackboard after placements were finished.

5.2.3.6 Confidentiality

To ensure confidentiality each participant was assigned a study code for the duration of the study. All names, student numbers or any other details that could identify participants were removed from the data. Study codes were meaningful only to the researcher (NMG). All data was saved on limited access username and password protected computer files. All written documentation was kept in secure filing cabinets in a locked office. Access to the data was limited to the researcher (NMG).

5.3 Data analysis

5.3.1 Quantitative data analysis

Questionnaire responses were entered into Microsoft Excel 2007. The dataset was password protected and was accessible only to NMG. Descriptive statistics were used to examine participants' responses and identify patterns. Blackboard usages reports were downloaded from Blackboard in the form of PDF files. All names and any other details that could identify participants were removed from the reports, which were saved in a password protected file accessible only to NMG. Descriptive statistics were used to analyse Blackboard usage and to identify patterns.

5.3.2 Qualitative data analysis

All names and any other details that could identify participants were removed from reflections. Thematic content analysis as described by Braun and Clark (2006) was used

for analysis of the reflections. This analysis is described in Chapters 3 and 4. This form of analysis was chosen as it is not linked with any pre-existing theoretical framework. It can be a realist method, which reports experiences, meanings and the reality of participants (Braun and Clarke, 2006). An inductive approach was chosen, in which the themes are strongly linked to the data (Braun and Clarke, 2006, Pope et al., 2000). Themes were identified at the semantic level where themes are identified within the explicit meanings and analysis does not look beyond what the participant has written (Braun and Clarke, 2006). An inductive semantic approach to thematic analysis is therefore a suitable analysis for participants' reflections.

This process of data analysis involves six phases which are detailed in Table 5.1. The first phase occurred during data familiarisation. Notes on initial ideas for themes and codes were produced during the first reading the data while re-reading it a second time (Braun and Clarke, 2006).

Phases of thematic analysis	
1. Familiarisation with the data	Reading and re-reading data, noting down initial ideas.
2. Generating initial codes	Systematic coding of the data across the entire data-set, collating data relevant to each code.
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes	Checking the themes work in relation to the coded extracts and the entire data-set.
5. Defining and naming themes	Generating clear definitions and names for each theme. Ongoing analysis to refine the specifics of each theme.
6. Producing the report	The final opportunity for analysis. Selection of extracts, final analysis of extracts, relating back to the research question and literature. Producing a scholarly report.

Table 5.1 Phases of thematic analysis (Braun and Clarke, 2006)

Initial codes were generated in the second phase. This initial list of codes was based on the objectives of the study and from familiarisation with the data. During this stage the reflections underwent a process of basic content analysis and two rounds of coding. This involved reading and re-reading of the reflections. Initially the reflections were read in their entirety in order to get a sense of the whole. On the second reading NMG used line-by-line analysis to identify common sub-categories of code within the preliminary codes. This was the first round of coding and was completed systematically throughout the entire data-set. The first version of the codebook was devised based on this basic content analysis. On the third reading, codes were assigned to the data, forming the second round of coding. An independent researcher (JG) checked all of the coded data for suitability of the coding system and the initial themes. This initial coding was discussed and clarifications proposed.

During the third phase the codes were sorted into potential themes and all the relevant coded extracts were collated within identified themes. Based on this and the review by JG, the codebook was then revised and modified. Codes and sub-codes were expanded if the codes did not adequately cover the theme or collapsed if they were unwarranted. A second and final version of the codebook was then produced and the data re-coded with this new codebook.

In the fourth phase the themes were reviewed. The entire data-set was re-read to ascertain whether the themes were suitable for the data-set and to re-code any additional or missed data within the finalised themes. The finalised themes and sub-themes were refined, defined and named in the fifth phase. The final analysis occurred during the production of the results and the discussion of the findings.

5.3.3 Inter-rater and intra-rater reliability of the qualitative data

An investigation of inter-rater and intra-rater reliability of the coding system was carried out. To investigate the inter-rater reliability, an independent coder, previously unconnected to the study (EMG), was provided with an un-coded copy of the data-set and asked to code it using the final codebook. All agreements and disagreements were counted to establish inter-rater reliability. Any disagreements between the initial coder

(NMG) and the independent coder were discussed and resolved. The data-set was coded by the original researcher (NMG) with a time interval of one month between initial and subsequent coding. The results were compared to establish the intra-rater reliability. The formula presented in Table 5.2 was used to calculate the reliability of the coding and is expressed as a percentage agreement (Miles and Huberman, 1994).

$\frac{\text{Number of agreements} \times 100}{\text{Total number of agreements} + \text{disagreements}}$

Table 5.2 Analysis of inter-rater and intra-rater reliability (Miles and Huberman, 1994)

5.4 Results

5.4.1 Demographics

Fifteen students expressed an interest in the study. One student was ineligible and another dropped out before taking the course. A total of 13 students therefore participated in the study (Table 5.1). One student failed to complete the reflective writing, all students completed the questionnaire at every time-point.

Study Three Demographics		(n=13)
Gender	Male	3
	Female	10
Placement allocation	Respiratory	2
	Musculoskeletal/Outpatients department	4
	Paediatrics	3
	Orthopaedics	2
	Care of the Elderly	1
	Primary care	1
Previous placements	Respiratory	9
	Musculoskeletal/Outpatients	10
	Paediatrics	6
	Orthopaedics	6
	Care of the Elderly	3
	Primary care	1
	Neurology	11
	Womens' Health	1

Table 5.3 Study III demographics

5.4.2 Quantitative results

5.4.2.1 Confidence

Confidence was assessed using 13 Likert scale questions (1: not confident at all – 5: very confident) which are divided into two categories. Results for confidence in their knowledge regarding MI and health behaviour change (HBC) (3 questions) are presented in Table 5.4.

Confidence in the understanding of factors that affect adherence increased for 92% (n=12) of participants immediately after the course. At time-point 3, after clinical placement, there was a decrease in confidence for 15.4% (n=2), an increase for 7.7% (n=1) with no change reported by 76.9% (n=10) (Figure 5.3). Confidence in the understanding the stages of change increased for 100% of participants (n=13) immediately after the course. After completing the clinical placement there was an increase in confidence for only one participant with a decrease for 46% (n=6) while the remaining 46% (n=6) showed no further change in confidence (Figure 5.4). Confidence in understanding the key concepts of MI increased for 100% of the participants (n=13) immediately after the course. There was no further increase in confidence with 53.8% (n=7) reporting no difference at time-point 3 and the remainder, 46.2% (n=6), reporting a decrease in confidence (Figure 5.5).

Clinical placement site and the use of resource material hosted on Blackboard had no impact on post-course results for confidence in knowledge regarding MI and HBC.

Results are presented in both a table (Table 5.4) and in figures (Figure 5.3, 5.4 and 5.5). The descriptive statistics presented in the table provide an overall sense of the results. Individual figures for each question are also presented to provide the reader with a sense of the change that occurred over time for each participant.

Question	Time-point	n=					Mean	Range	Median
		Not confident at all	Not confident	Neutral	Confident	Very confident			
How confident are you in your understanding of factors that affect adherence?	Pre-course	1	4	5	3	0	2.8	1-4	3
	Post-course	0	0	2	9	2	4	3-5	4
	Post-placement	0	1	1	9	2	3.9	2-5	4
How confident are you in your understanding of the stages of change?	Pre-course	2	5	4	2	0	2.5	1-4	2
	Post-course	0	0	0	4	9	4.7	4-5	5
	Post-placement	0	0	1	10	2	4.1	3-5	4
How confident are you in your understanding of the key concepts of motivational interviewing?	Pre-course	4	3	5	1	0	2.2	1-4	2
	Post-course	0	0	0	5	8	4.6	4-5	5
	Post-placement	0	0	1	10	2	4.1	3-5	4

Table 5.4 Confidence in knowledge regarding motivational interviewing and health behaviour change questions

How confident are you in your understanding of factors that affect adherence?

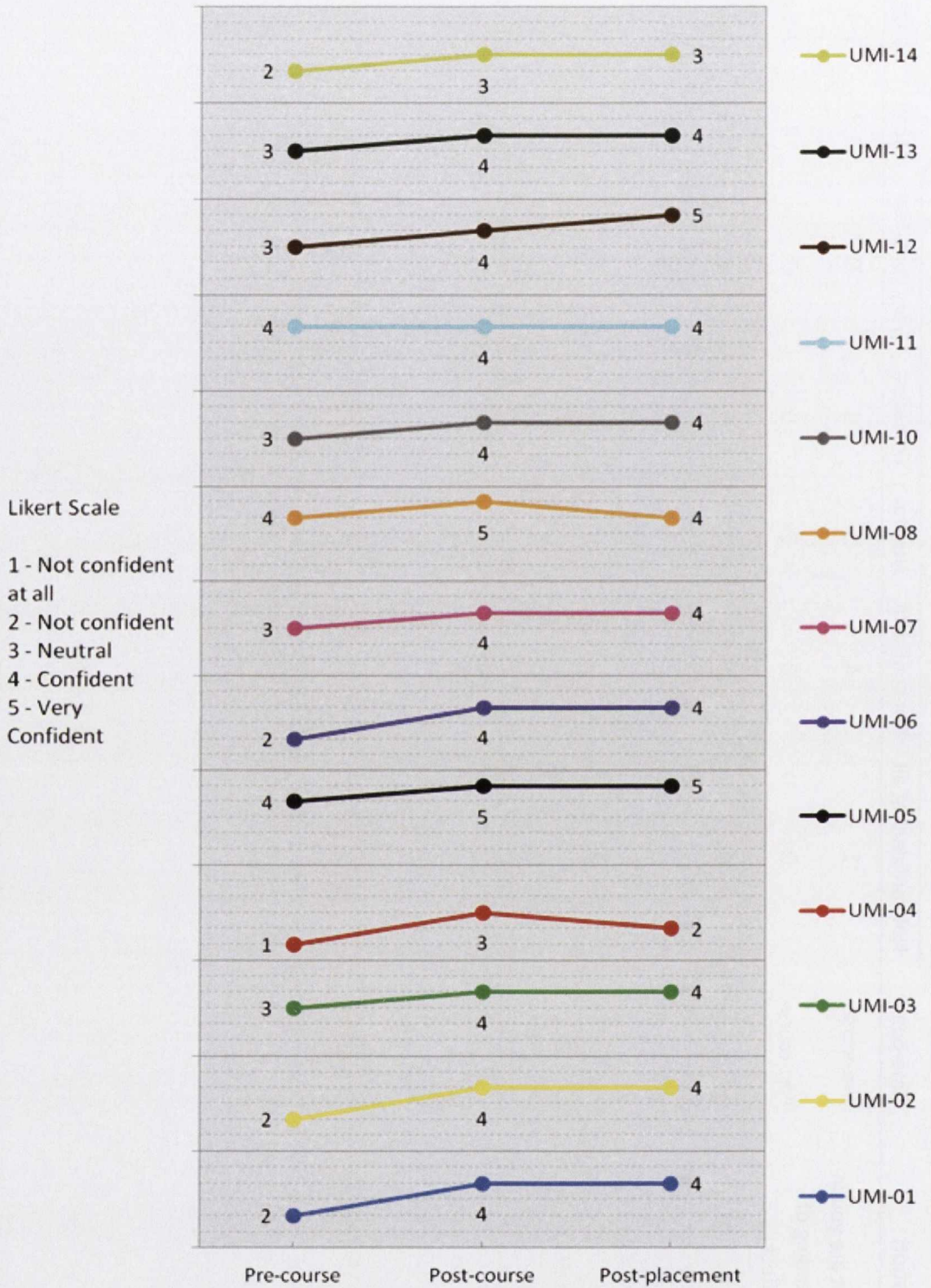


Figure 5.3 Confidence in understanding the factors that affect adherence

How confident are you in your understanding of the stages of change?

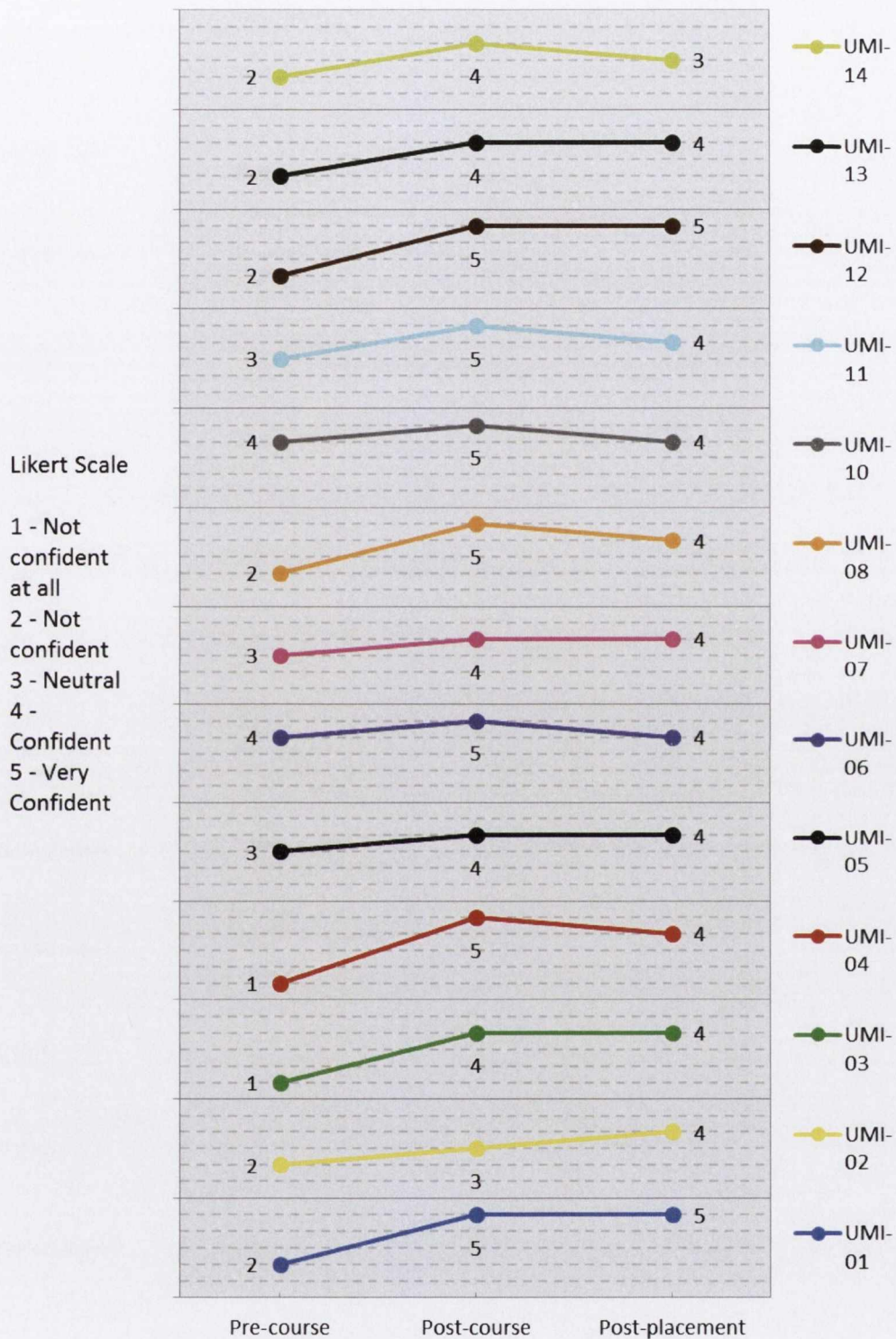


Figure 5.4 Confidence in understanding of the stages of change

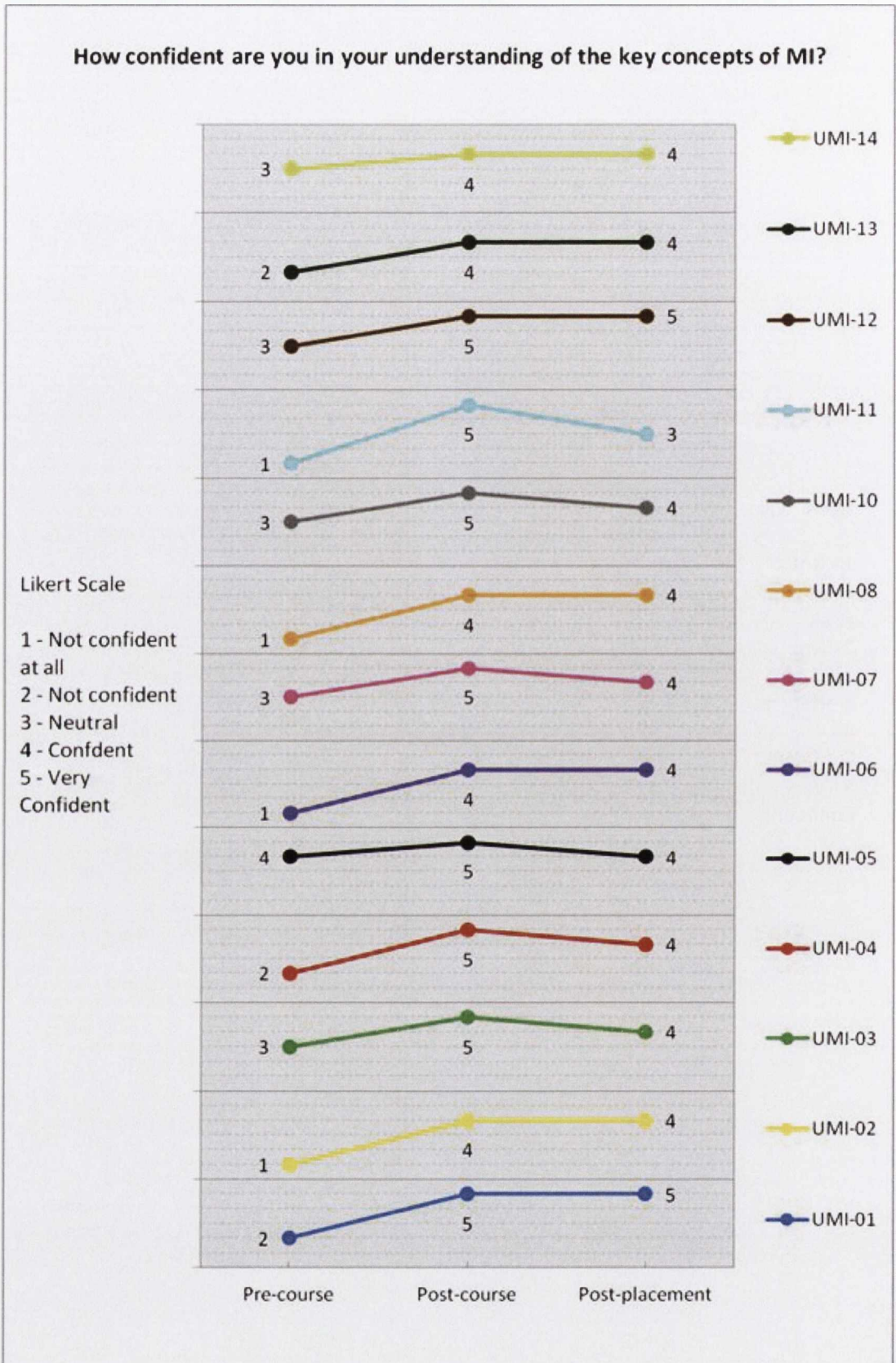


Figure 5.5 Confidence in understanding the key concepts of MI

Results for confidence in practice of MI and HBC (10 questions) are presented in table 5.5. Confidence in MI skills rose for 84.7% (n=11) of participants after attending the course with no decrease for any participant. At time-point 3, after clinical placement, it increased for 23.1% (n=3) and decreased for the same number, with no change for 53.9% (n=7) (Figure 5.6). Confidence in the ability to develop MI skills increased for 23.1% (n=3) of participants after the course, who no decrease reported. At time-point 3 there was an increase for 23.1% (n=3) and a decrease for 7.7% (n=1) (Figure 5.7). Confidence in the ability to introduce oneself to a new patient increased for 53.7% (n=7) of participants with a decrease for one participant after the course while after clinical placement there was an increase for 23.1% (n=3) with 15.4% (n=2) of participants reporting a decrease in confidence (Figure 5.8). Confidence in assessing a patient's readiness for change increased for 84.7% (n=11) of participants after the course with a decrease reported by the remaining 15.4% (n=2). At time-point 3, 38.5% (n=5) reported a decrease in confidence while 15.4% (n=2) reporting an increase (Figure 5.9). Confidence in the ability to express empathy increased for 46.2% (n=6) of participants after the course while it decreased for 7.7% (n=1). At time-point 3, confidence in expressing empathy increased for 38.5% (n=5) and decreased for 23.1% (n=3) (Figure 5.10). Assessment of confidence in interpersonal skills included asking about eye contact, using open-ended questions and use of silence in an interview. Confidence in interpersonal skills increased for 69.3% (n=9) and decreased for 30.8% (n=4) after the course. At the third time-point, after clinical placement, there was decrease in confidence in interpersonal skills for 23.1% (n=3) and an increase for 7.7% (n=1) (Figure 5.11). Confidence in the ability to motivate a patient with obesity to increase their physical activity increased for 77% (n=10) of participants after the course while it decreased for 7.7% (n=1). At time-point 3 confidence in ability to motivate decreased for 30.8% (n=4) and increased for 7.7% (n=1) (Figure 5.12). Confidence in the ability to motivate a patient to lose weight increased for 77% (n=10) of participants after the course. This decreased for 46.2% (n=6) of participants at time-point 3, with no participants reporting an increase (Figure 5.13). Confidence in the ability to improve adherence to physiotherapy increased after the course for 84.7% (n=11) of participants. There was a decrease for 38.5% (n=5) at time-point 3 and an increase for 15.4% (n=2)

(Figure 5.14). Directly after the course 53.9% (n=7) increased the rating of their skills in advising a patient to change any health-related behaviour. At time-point 3, 15.4% (n=2) reported an increase and 7.7% (n=1) reported a decrease in the rating of their skills (Figure 5.15).

The clinical site participants were allocated to and the use of resource material hosted on Blackboard had no impact on post-course results for confidence in practice of MI and HBC.

Results are again presented in both a table (Table 5.5) and in individual figures (Figure 5.6 to figure 5.15). The descriptive statistics presented in table 5.5 provide an overall sense of the results. Individual figures for each question provide the reader with a sense of the change that occurred over time for each participant.

Table 5.5 Confidence in practice of motivational interviewing and health behaviour change

Question	Time-point	n=					Mean	Range	Median
		Not confident at all	Not confident	Neutral	Confident	Very confident			
How confident are you in your own motivational interviewing skills?	Pre-course	6	1	5	1	0	2.1	1-4	2
	Post-course	0	0	3	10	0	3.8	3-4	4
	Post-placement	0	0	5	6	2	3.8	3-5	4
How confident are you in your ability to develop motivational interviewing skills?	Pre-course	0	0	0	9	4	4.3	4-5	4
	Post-course	0	0	0	7	6	4.5	4-5	4
	Post-placement	0	0	0	6	7	4.5	4-5	5
How confident are you in your ability to introduce yourself to a new patient?	Pre-course	0	0	1	8	4	4.2	3-5	4
	Post-course	0	0	0	4	9	4.7	4-5	5
	Post-placement	0	0	1	1	11	4.8	3-5	5

Question	Time-point	n=						Mean	Range	Median
		Not confident at all	Not confident	Neutral	Confident	Very confident				
How confident are you in assessing a patient's readiness for change?	Pre-course	2	2	6	3	0	2.8	1-4	3	
	Post-course	0	0	1	8	4	4.2	3-5	4	
	Post-placement	0	0	2	10	1	3.9	3-5	4	
How confident are you in your ability to express empathy and reflect a patient's emotions during an interview?	Pre-course	1	0	2	6	4	3.9	1-5	4	
	Post-course	0	0	1	6	4	4.4	3-5	4	
	Post-placement	0	0	1	4	8	4.5	3-5	5	
How confident are you in your interpersonal skills, such as eye contact, asking open-ended questions and using silence in an interview with a patient?	Pre-course	0	2	5	3	3	3.5	2-5	3	
	Post-course	0	0	0	8	5	4.4	4-5	4	
	Post-placement	0	0	3	4	6	4.2	3-5	4	

Question	Time-point	n=					Mean	Range	Median
		Not confident at all	Not confident	Neutral	Confident	Very confident			
If you met a patient with obesity in your practice, how confident would you be in your ability to motivate the patient to increase their physical activity?	Pre-course	1	4	4	3	1	2.9	1-5	3
	Post-course	0	0	2	9	2	4	3-5	4
	Post-placement	0	0	6	5	2	3.7	3-5	4
How confident are you in your skills to motivate a patient to lose weight?	Pre-course	0	3	6	4	0	3.1	2-4	3
	Post-course	0	0	1	8	4	4.2	3-5	4
	Post-placement	0	0	4	8	1	3.8	3-5	4
How confident are you in your ability to improve adherence to physiotherapy?	Pre-course	0	2	7	2	0	3	2-4	3
	Post-course	0	0	1	7	3	4.2	3-5	4
	Post-placement	0	0	3	7	1	3.9	3-5	4

Question	Time-point	n=					Mean	Range	Median
		Very Poor	Poor	Neutral	Good	Very Good			
Overall, how would you rate your current skills in advising a patient to change any health-related behaviour?	Pre-course	1	4	4	4	0	2.8	1-4	3
	Post-course	0	0	3	9	1	3.8	3-5	4
	Post-placement	0	0	2	10	1	3.9	3-5	4

Table 5.5 Confidence in practice of motivational interviewing and health behaviour change

How confident are you in your own motivational interviewing skills?

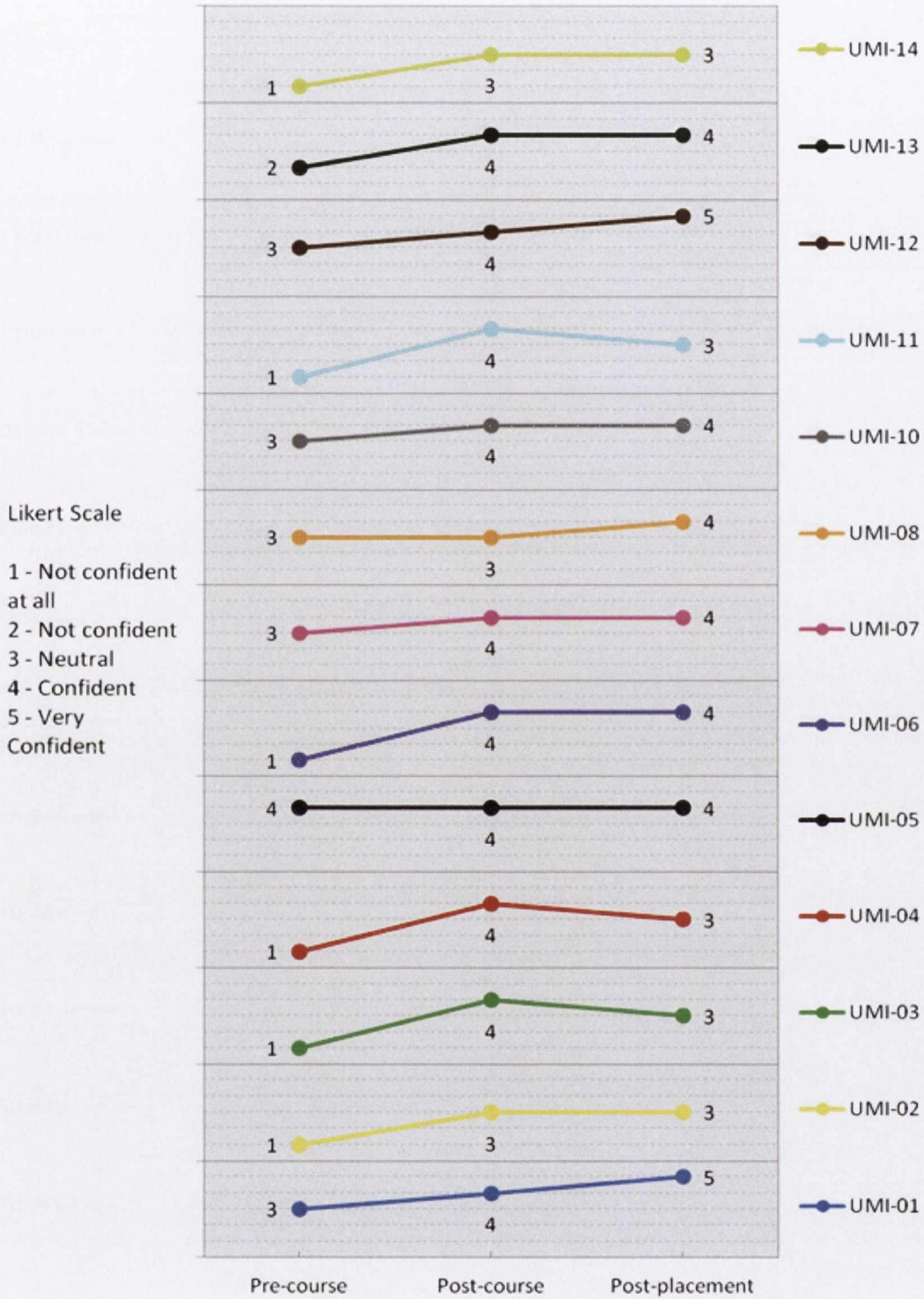


Figure 5.6 Confidence in their own motivational interviewing skills

How confident are you in your ability to develop MI skills?

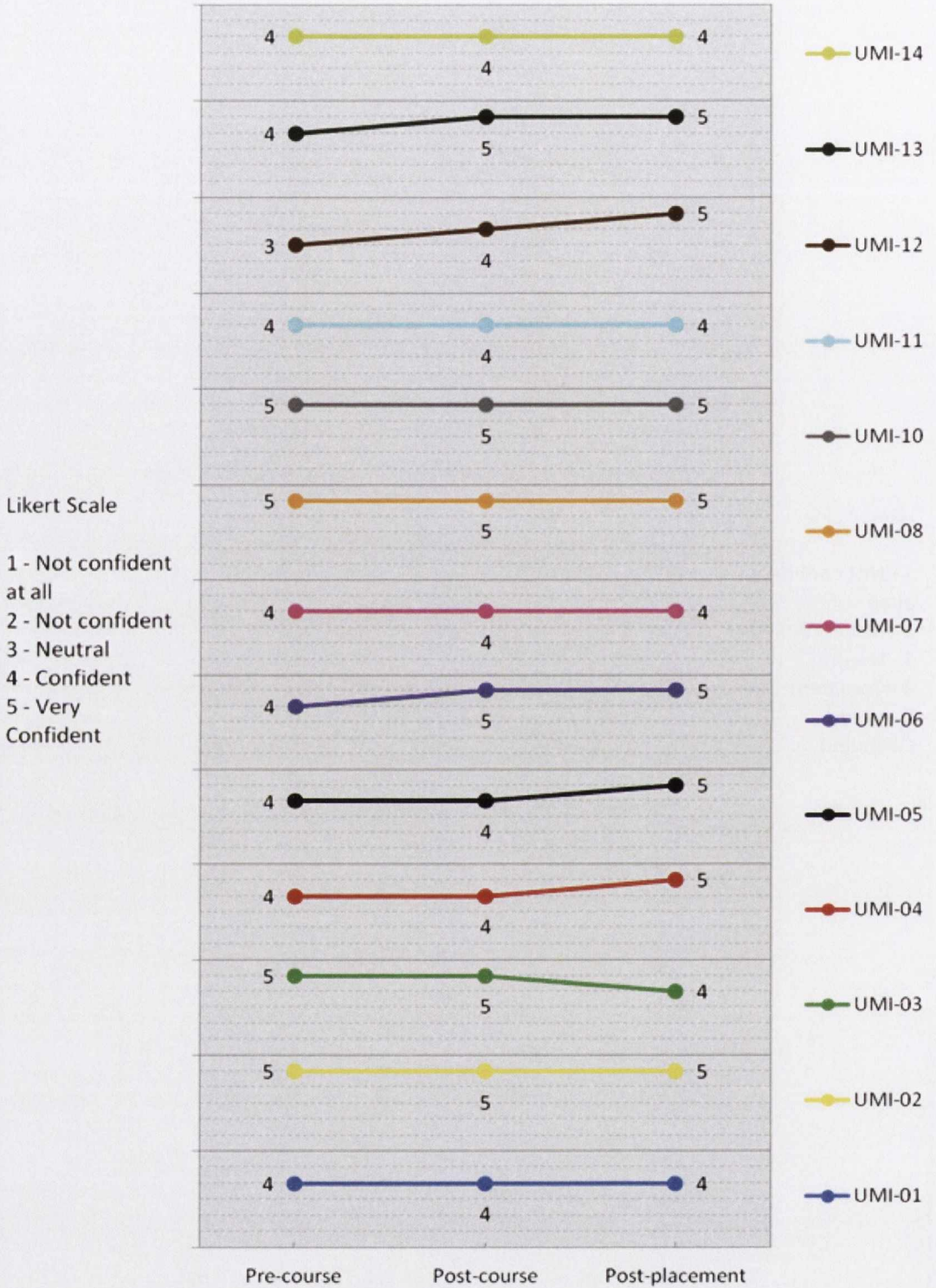


Figure 5.7 Confidence in the ability to develop motivational interviewing skills

How confident are you in your ability to introduce yourself to a new patient?

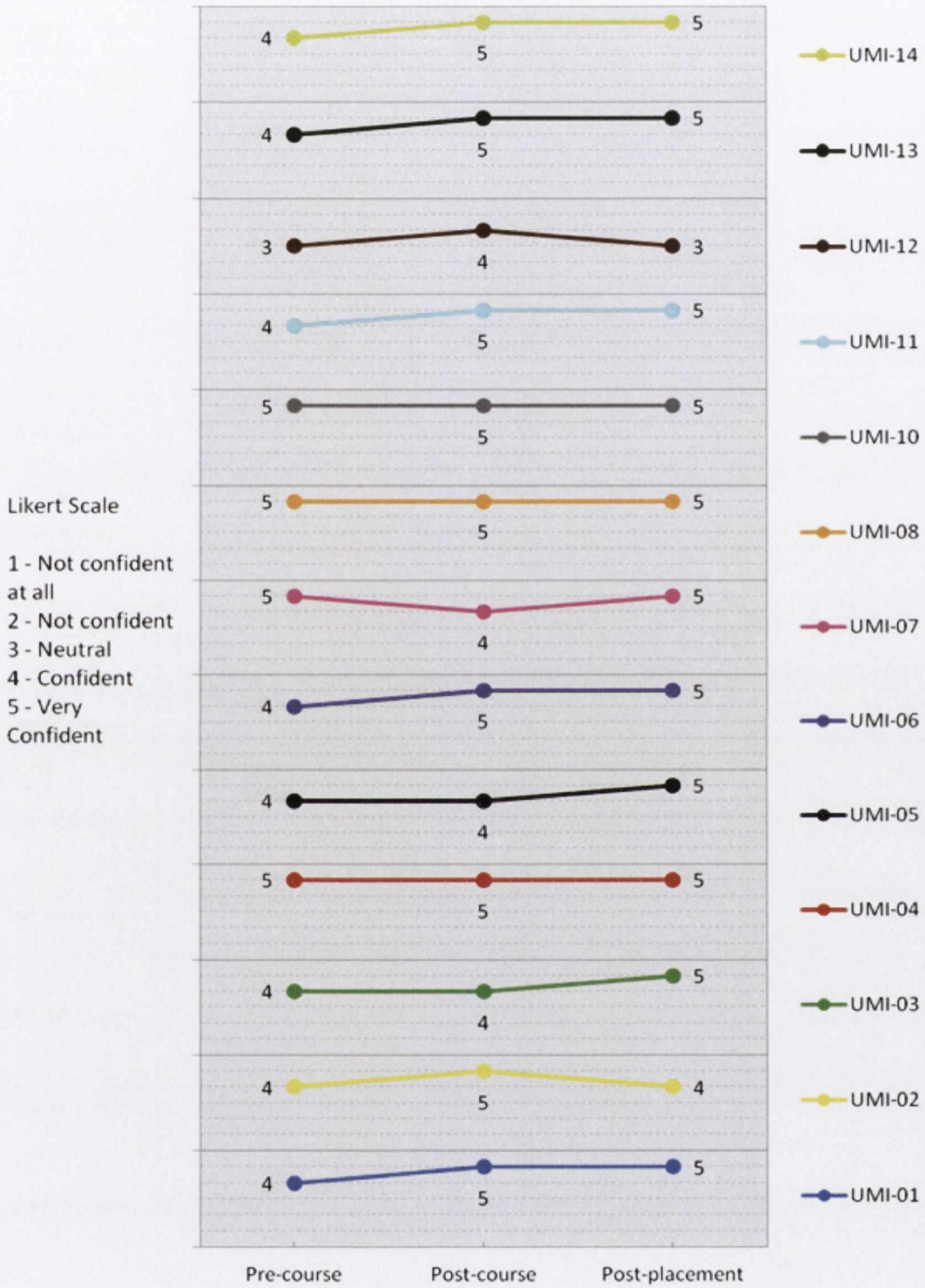


Figure 5.8 Confidence in one's ability to introduce oneself to a new patient

How confident are you in assessing a patient's readiness for change?

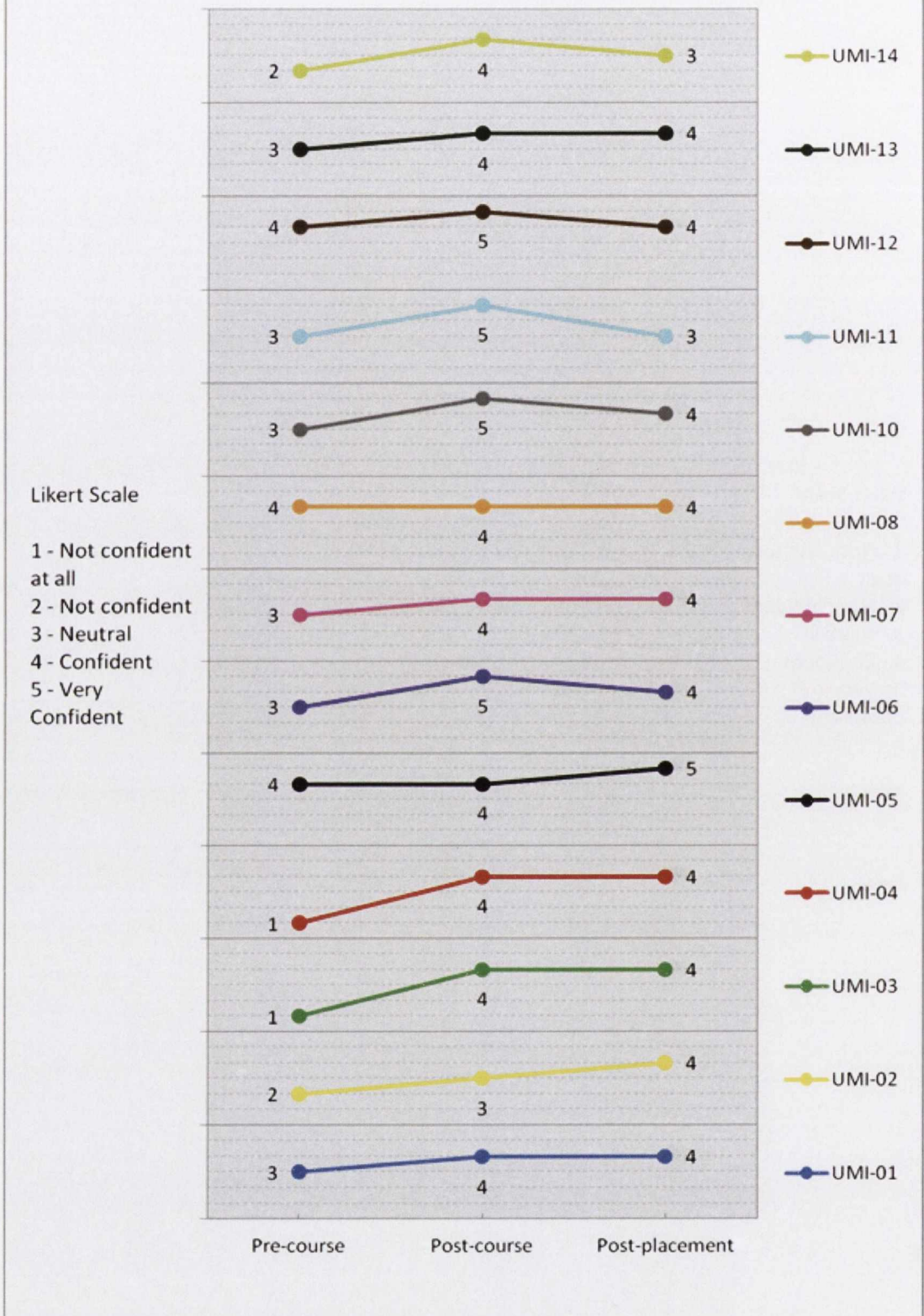


Figure 5.9 Confidence in assessing a patient's readiness for change

How confident are you in your ability to express empathy and reflect a patient's emotions during an interview?

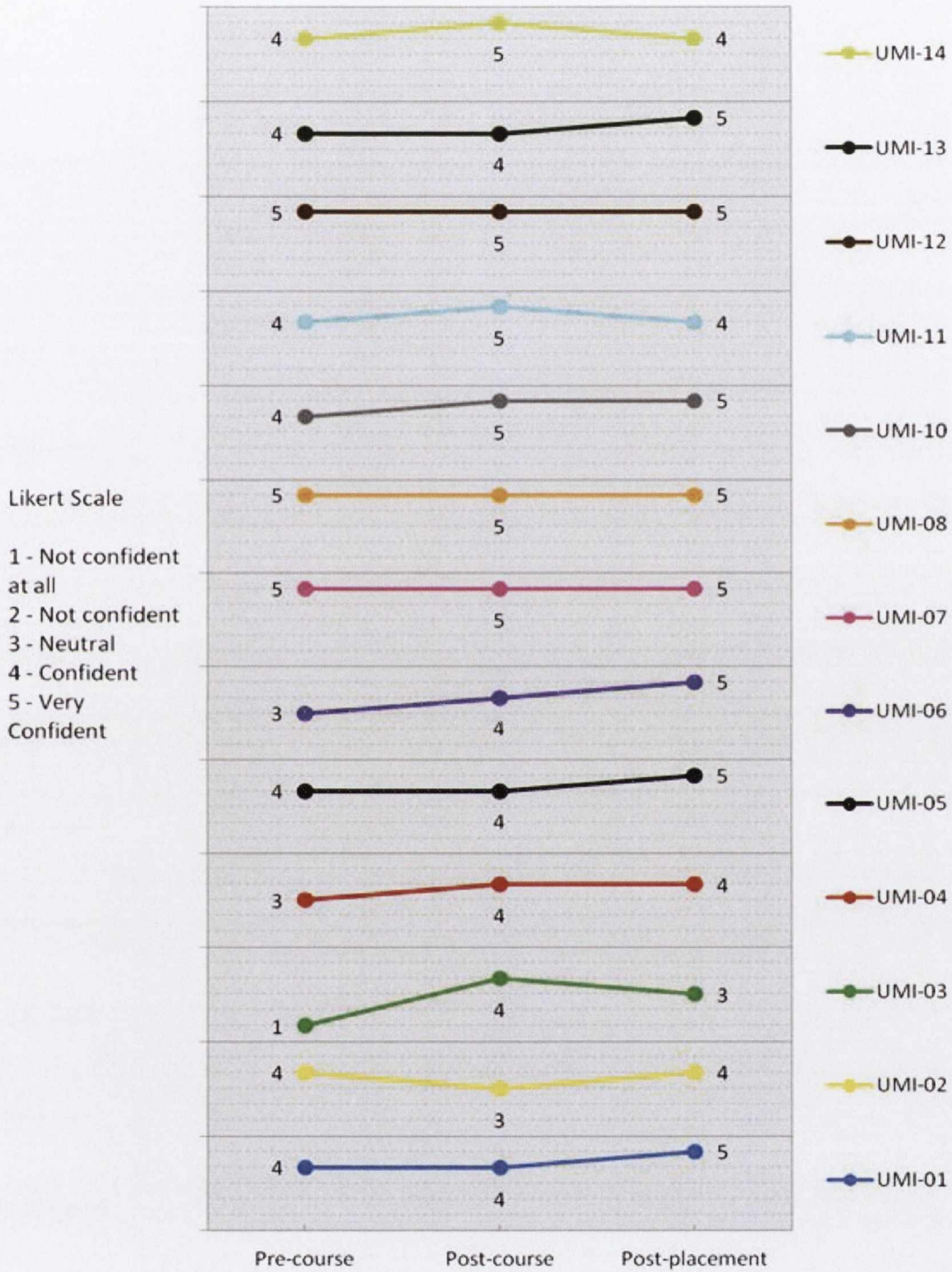


Figure 5.10 Confidence in the ability to express empathy and reflect a patient's emotions

How confident are you in your interpersonal skills, such as eye contact, asking open-ended questions and using silence in an interview with a patient?

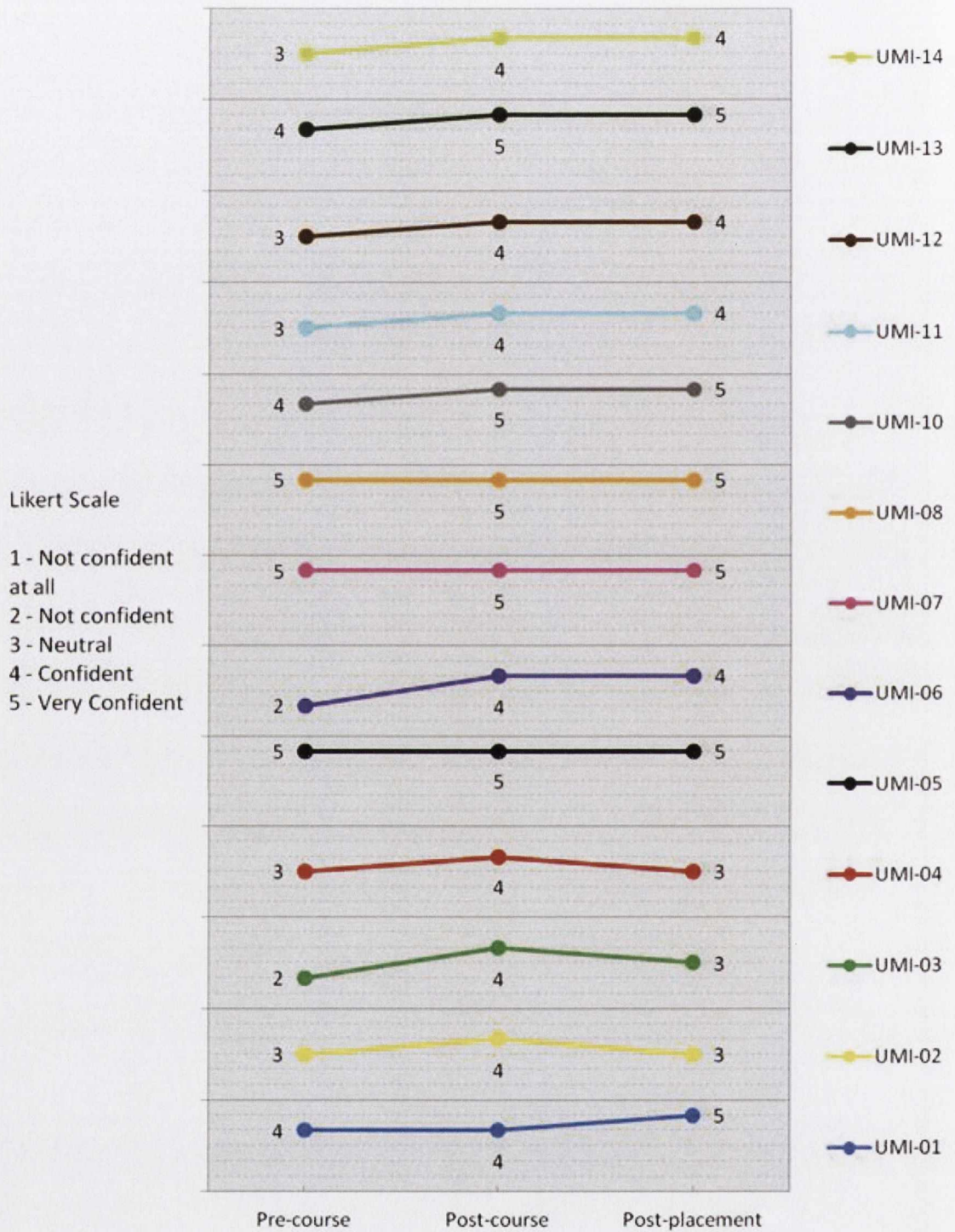


Figure 5.11 Confidence in interpersonal skills

If you met a patient with obesity in your practice, how confident would you be in your ability to motivate the patient to increase their physical activity?

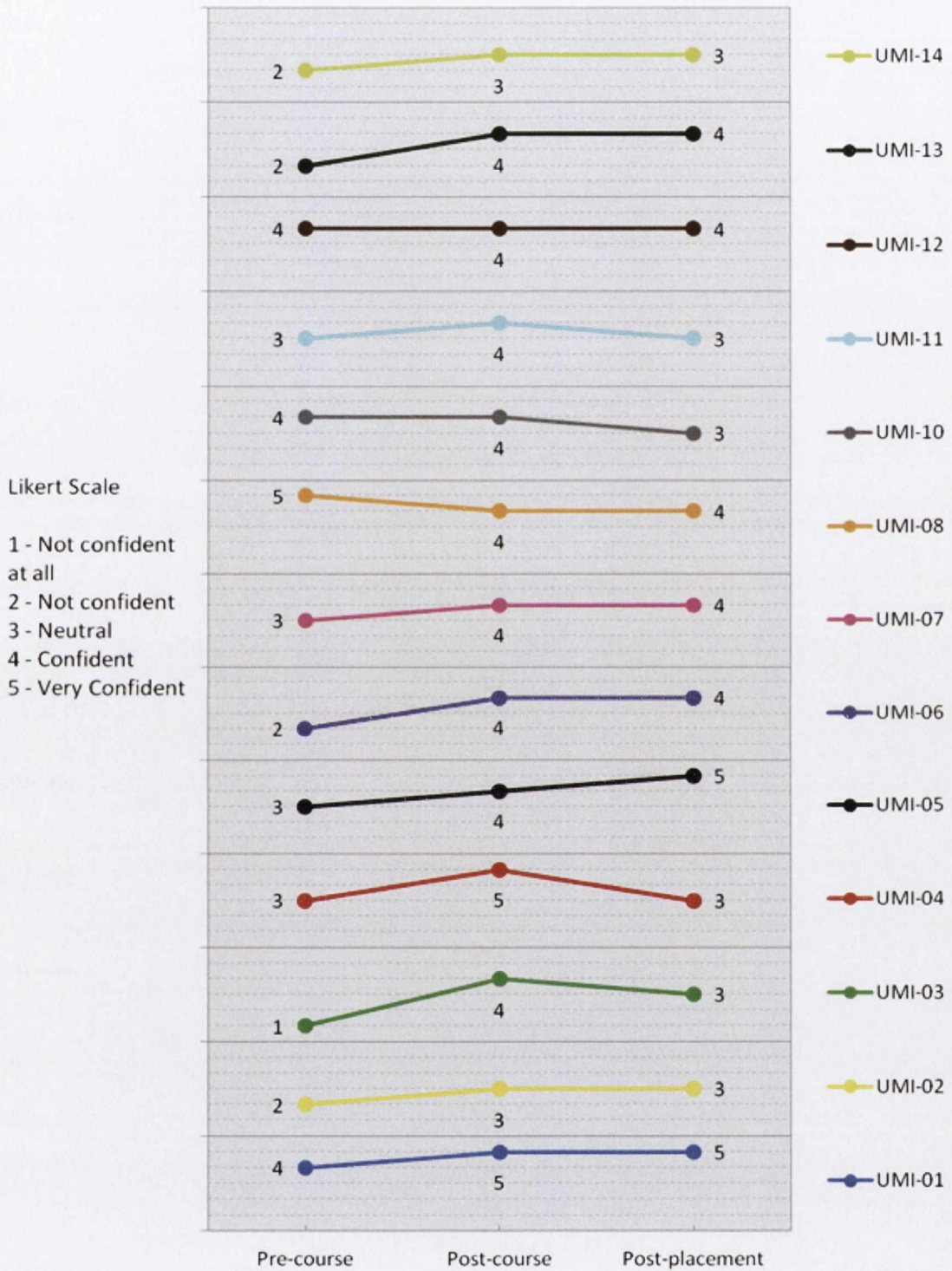


Figure 5.12 Confidence in the ability to motivate an obese patient to increase their physical activity

How confident are you in your skills to motivate a patient to lose weight?

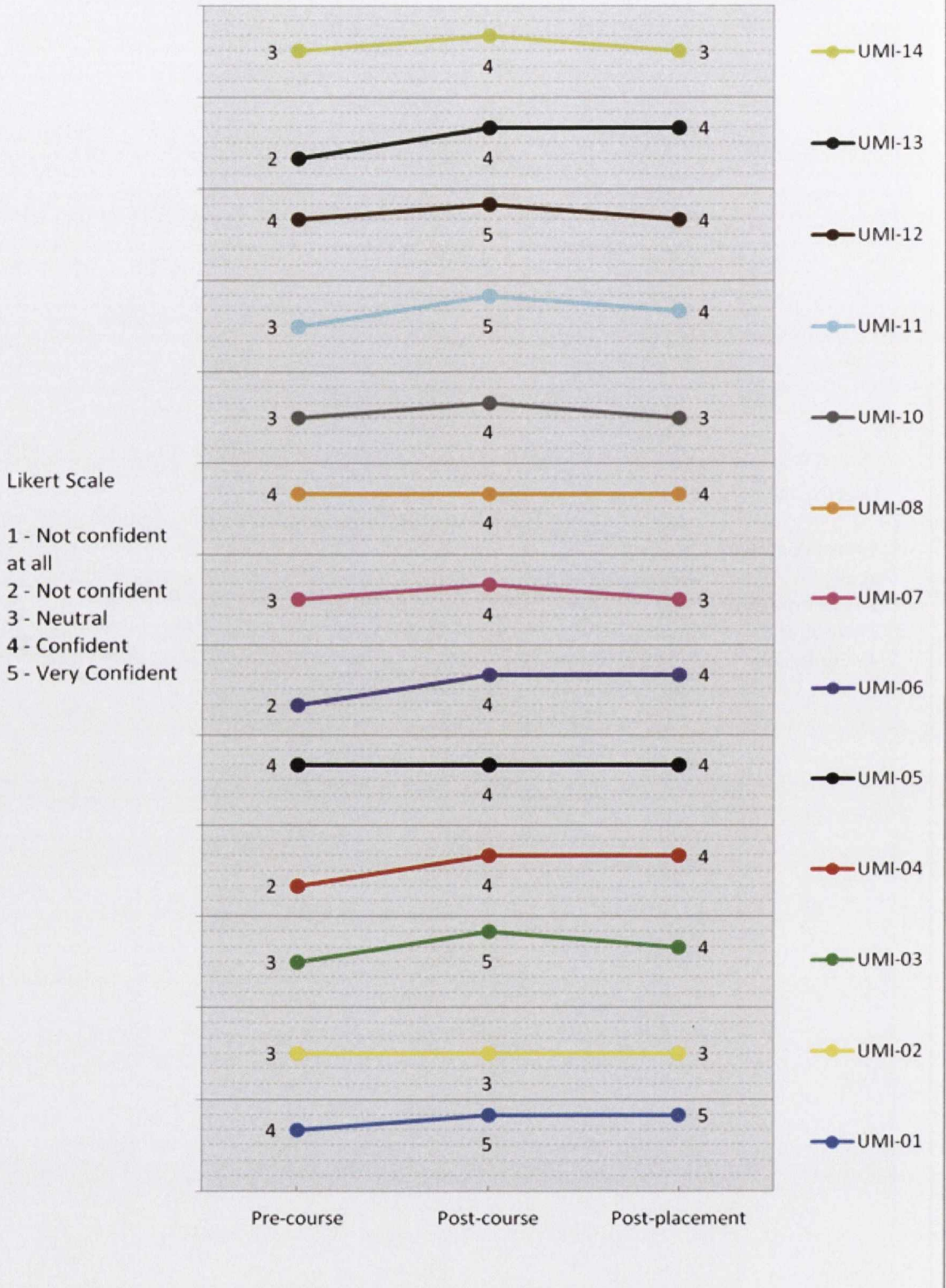


Figure 5.13 Confidence in the skills to motivate a patient to lose weight

How confident are you in your ability to improve adherence to physiotherapy?

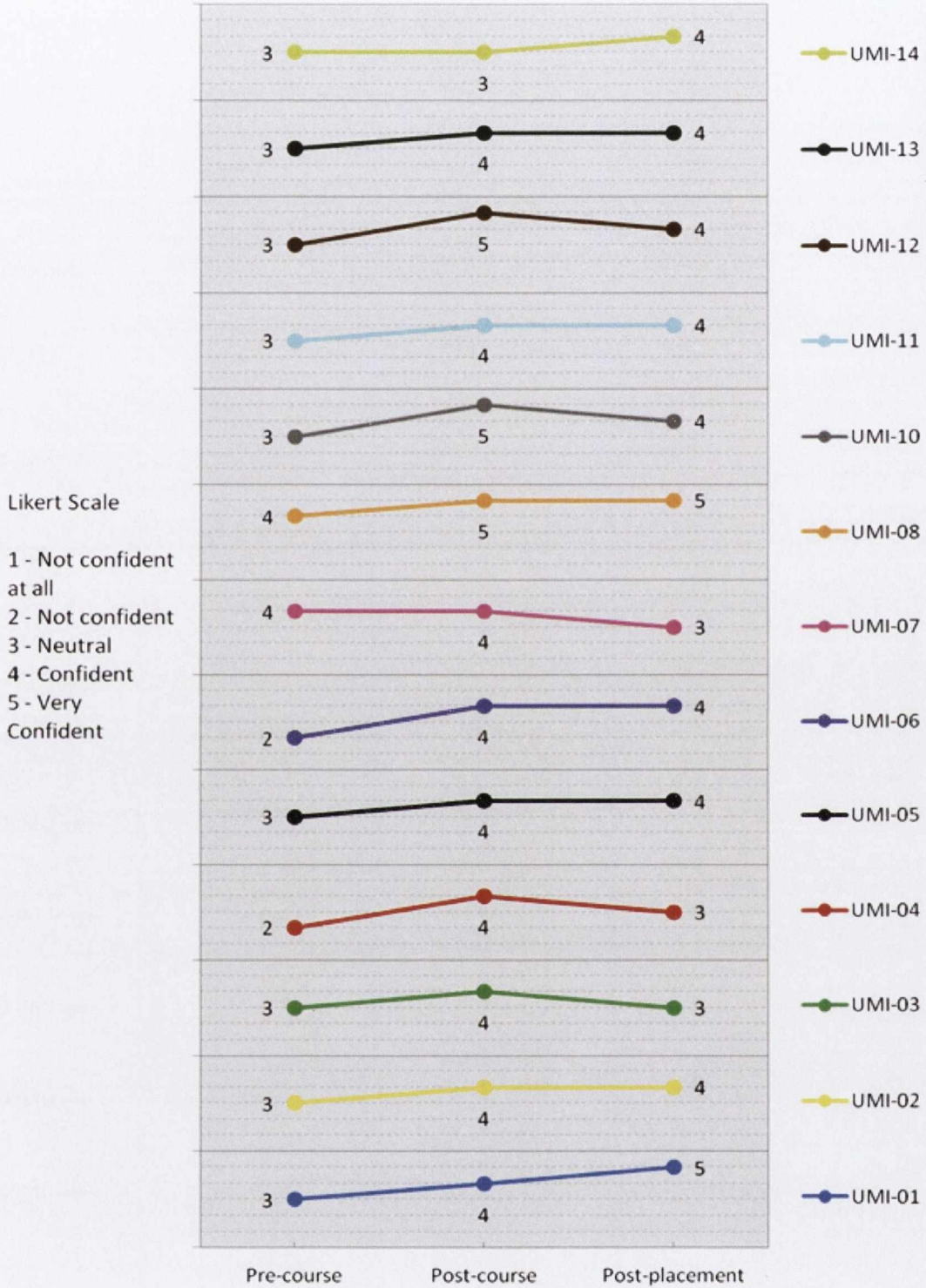


Figure 5.14 Confidence in the ability to improve adherence to physiotherapy

Overall, how would you rate your current skills in advising a patient to change any health-related behaviour?

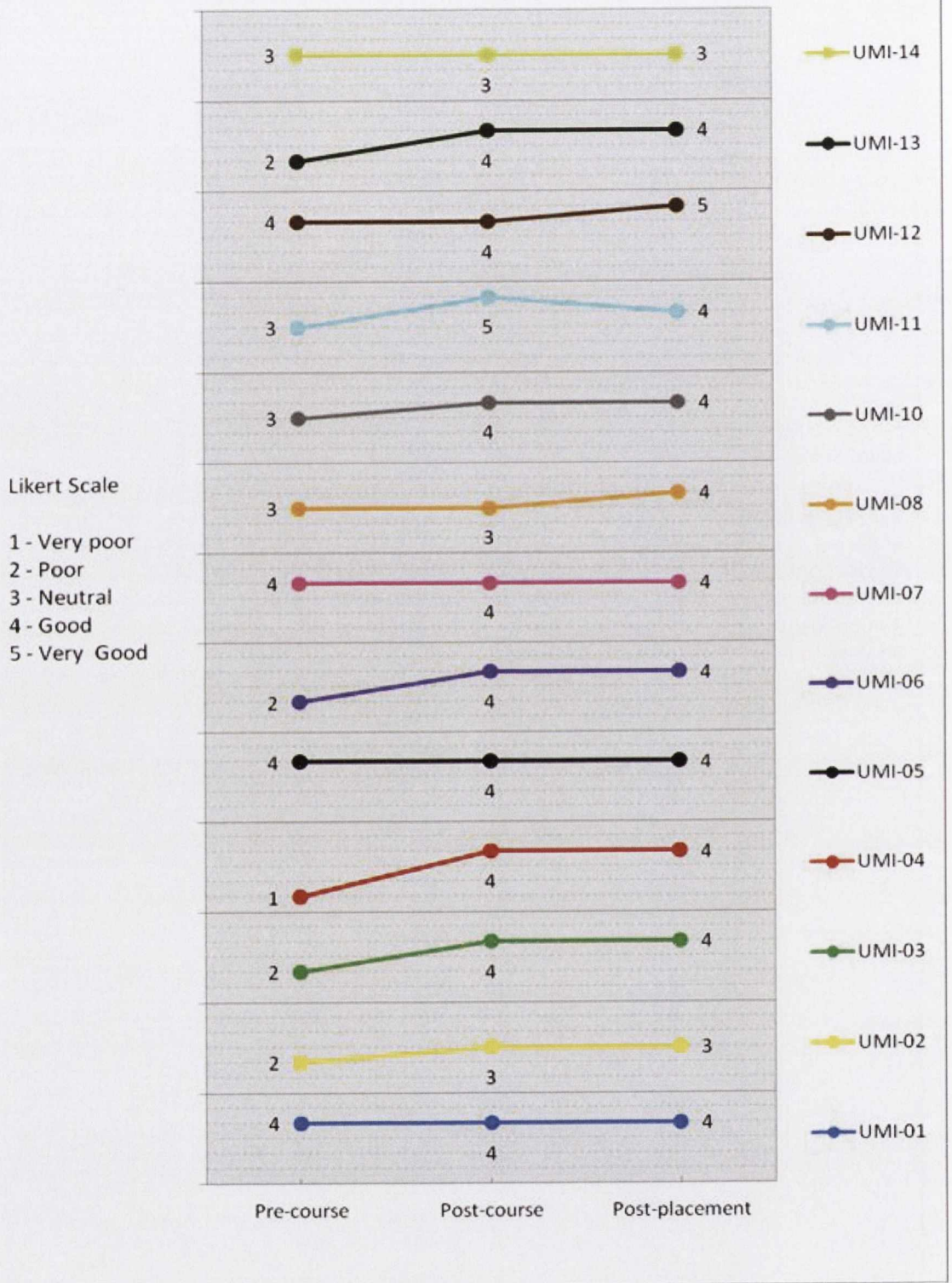


Figure 5.15 Self-rating of current skills in advising a patient to change any health-related behaviour

5.4.2.2 Knowledge and opinion

Knowledge was assessed with 6 questions. Results are presented in table 5.7.

Thirteen participants answered 6 questions each giving a total of 78 responses. At baseline 33.3% of the answers were correct (26/78). At time-point 2, directly after the course 75.6% (59/78) of answers were correct. At the final time-point, after completing a clinical placement, 7 weeks after completing the course, 70.5% (55/78) of answers were correct.

Clinical placement allocation or the use of resource material hosted on Blackboard had no impact on post-course results for knowledge of MI and HBC.

Participants were asked whether they agreed with a statement regarding the role of physiotherapists in behaviour change. Responses are presented in Figure 5.16. Only two participants neither agreed nor disagreed prior to the course, the remaining participants either agreed or strongly agreed. All participants either agreed or strongly agreed for the remaining time-points.

5.4.2.3 Blackboard use

Data on each participant's use of the online resources hosted on Blackboard was collected and is presented in table 5.8.

Question	Time-point	n=	
		Correct	Incorrect
<i>Multiple-choice question</i> Prochaska's Stages of Change include all the following except?	Pre-course	3	10
	Post-course	9	4
	Post-placement	10	3
<i>Multiple-choice question</i> Mr. Murphy has been gaining weight steadily over the last few years. He has tried several different "fad diets" without much success in the past. He has never done any appreciable exercise, and is currently not following any particular diet. He reports he would like to lose about 10kg both for health reasons and to feel better about his appearance. Mr. Murphy is likely in which stage of change?	Pre-course	9	4
	Post-course	12	1
	Post-placement	10	3
<i>True or false question</i> Readiness to change is a fluctuating product of interpersonal interactions.	Pre-course	3	10
	Post-course	12	1
	Post-placement	12	1
<i>Listing question</i> Name three broad clinical concepts underlying motivational interviewing.	Pre-course	1	12
	Post-course	2	11
	Post-placement	3	10
<i>True or false question</i> In motivational interviewing, it is the patient who presents the arguments for change.	Pre-course	10	3
	Post-course	13	0
	Post-placement	13	0
<i>Multiple-choice question</i> Ambivalence is most likely to be seen at which stage of change?	Pre-course	0	13
	Post-course	11	2
	Post-placement	7	6

Table 5.6 Knowledge of motivational interviewing

Behaviour change counselling is an important and effective intervention performed by physiotherapists.

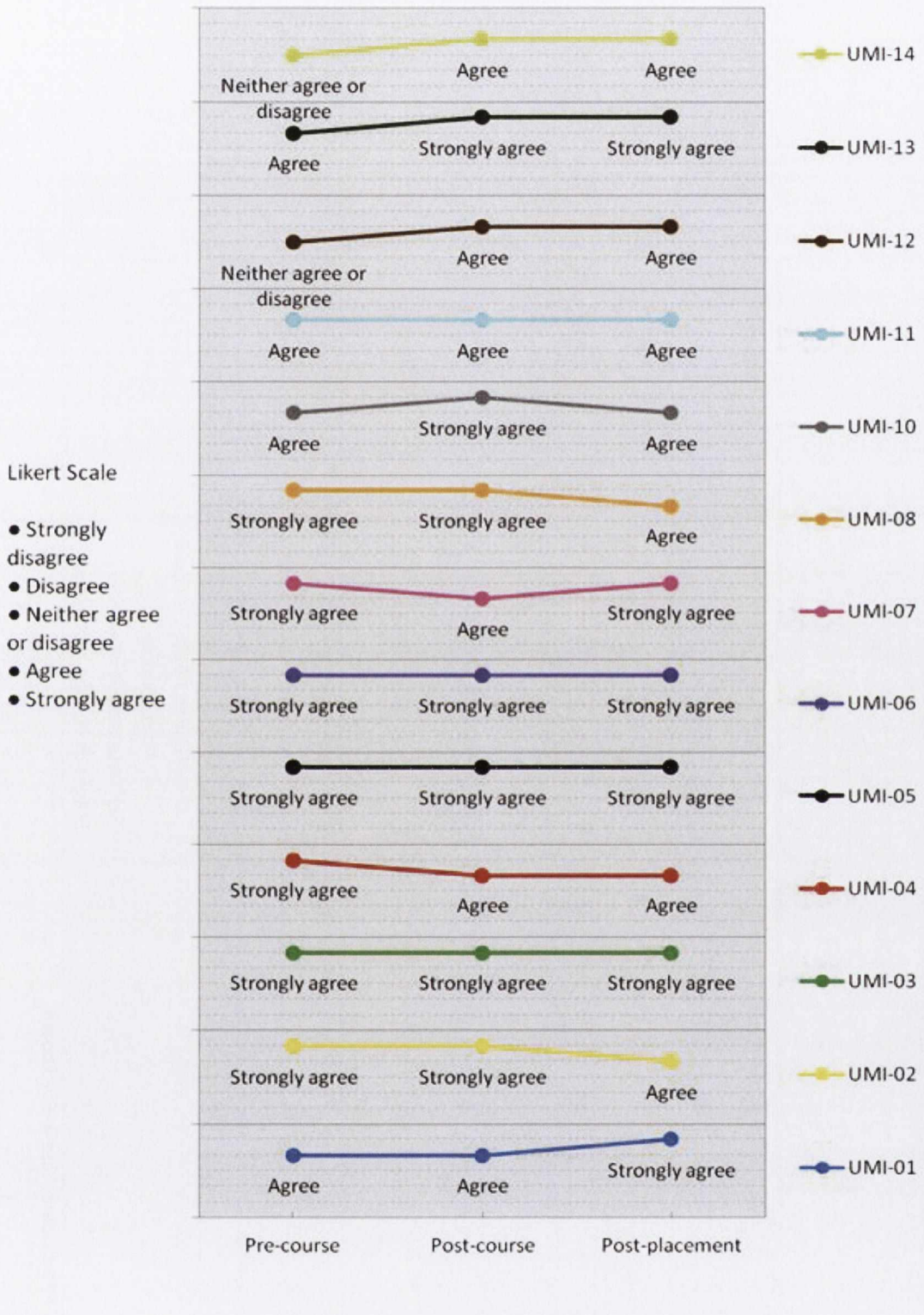


Figure 5.16 Opinions on the importance of health behaviour change for physiotherapists

	Accessed Blackboard	Resource accessed	Week Accessed	Discussion board participation
UMI-01	No	-	-	-
UMI-02	Yes	Course Notes MI resources	2	No
UMI-03	Yes	MI resources Self-assessment resources	4	No
UMI-04	No	-	-	-
UMI-05	No	-	-	-
UMI-06	Yes	Course notes	6	No
UMI-07	Yes	Course notes	3	No
UMI-08	Yes	Course notes MI resources Self-assessment resources Stages of change resources	2	No
UMI-10	No	-	-	-
UMI-11	Yes	Course notes	2	No
UMI-12	Yes	Course notes MI resources Self-assessment resources	6	No
UMI-13	No	-	-	-
UMI-14	Yes	Course notes MI resources Self-assessment resources Stages of change resources	6	No

Table 5.7 Participants' use of Blackboard

5.4.3 Qualitative results

5.4.3.1 Inter-rater and intra-rater reliability of the qualitative data

The method used to examine the reliability of the coding and the formula used to calculate the inter-rater and intra-rater reliability was described in Section 5.3.1.3. The results are presented in Table 5.8 and Table 5.9. When calculating the inter-rater reliability most discrepancies were errors of omission, where one or the other coder overlooked text that could be coded. All disagreements that were not an error of omission were resolved through discussion.

$$\begin{aligned} & \frac{\text{Number of agreements} \times 100}{\text{Total number of agreement} + \text{disagreements}} \\ & = \frac{102 \times 100}{102 + 32} \\ & = 76.2\% \end{aligned}$$

Table 5.8 Inter-rater reliability of the qualitative coding system (Miles and Huberman, 1994)

$$\begin{aligned} & \frac{\text{Number of agreements} \times 100}{\text{Total number of agreement} + \text{disagreements}} \\ & = \frac{113 \times 100}{113 + 21} \\ & = 84.4\% \end{aligned}$$

Table 5.9 Intra-rater reliability of the qualitative coding system (Miles and Huberman, 1994)

It is common to expect that inter-rater reliability be $\geq 70\%$ (Miles and Huberman, 1994) while others suggest it should be as high as 80% to 90% by the final round of coding (Hruschka et al., 2004). The accepted value of intra-rater reliability of the coding system is $\geq 80\%$ (Miles and Huberman, 1994). The results obtained demonstrate high intra-rater reliability and acceptable inter-rater reliability of the coding system.

5.4.3.2 Themes and sub-themes

Three themes were identified from the analysis of the reflective writing which is described in Section 5.3.1.2. The themes and sub-themes are presented in Table 5.10

Themes	1. Barriers	2. Facilitators	3. Awareness
Sub-themes	<ul style="list-style-type: none"> • Lack of feasibility • Lack of support • Time • Lack of confidence 	<ul style="list-style-type: none"> • Feasibility • Educator support • Practice • Blackboard 	<ul style="list-style-type: none"> • Importance of effective communication • Practice methods • Success • Intention to use

Table 5.10 Themes and sub-themes generated through analysis of the reflections

5.4.3.3 Theme 1: Barriers

The first theme identified in the data was ‘Barriers’ which included the following sub-themes; ‘Lack of feasibility’, ‘Lack of support’, ‘Time’ and ‘Lack of confidence’. Lack of feasibility included poor patient suitability such as patients who were already motivated and those who did not want to change. This sub-theme was identified in the data of 10 participants from all of the clinical areas students were allocated to.

“Some of the patients come in and are already ready to get on with whatever exercises they have to do and don’t need or want such input.” [UMI12 – Out-patient department placement]

“I had a few LBP patients still in the pre-contemplation phase who were just looking for a quick fix that didn’t involve them doing much themselves. I tried motivational interviewing with them but decided they weren’t yet ready for change.” [UMI03 – Out-patient department placement]

Feasibility also included a lack of opportunity to implement or practice MI as a barrier.

“There were no real opportunities to practice these skills whilst on placement.” [UMI10 – Primary care placement]

The second barrier sub-theme identified in the data was a lack of support from practice educators, clinical tutors and other members of the physiotherapy staff. This sub-theme was identified in all of the clinical areas students were allocated to indicating that a lack of support does not depend on the clinical site.

“This differed greatly to the communication style of my senior who generally instructed patients on what to do and adopted an “if you don’t do XYZ, the consequences will be ABC” style of communication with patients, and preferred me to do likewise.” [UMI10 – Primary care placement]

‘Time’ was identified as a barrier by participants. This was identified in the in-patient setting, the out-patient setting by the participant allocated to a primary care placement.

“Given the time constraints of a physiotherapy session, I don’t think there was ample time to fully engage with the patients.” [UMI04 – Paediatric placement]

The final barrier identified was a ‘Lack of confidence’. This was reported students completing placement in both the out- and in-setting. For those who a lack of confidence was identified in their data only one reported a decrease for the majority of the questions assessing confidence after completing placement. The remaining students reported no change in confidence for the majority of these questions. The average score for confidence prior to placement for the six participants who reported a lack of confidence was 4.1, which dropped to an average of 3.8 after completing placement.

“I lost the confidence needed to probe further and from then on the treatment session reverted to its normal format...I realised that what held me back were a number of factors: the precarious nature of the situation and the lack of confidence in my own skills.” [UMI14 – Paediatric placement]

5.4.3.4 Theme 2: Facilitators

The second theme identified was ‘Facilitators’. This theme included four sub-themes; ‘Feasibility’, ‘Educator support’, ‘Practice’ and ‘Blackboard’. As it was with barriers, ‘Feasibility’ also included patient suitability and opportunity to practice. This sub-theme was identified in the data of students in both out-and in-patient departments.

"I wanted to tackle two particular patient groups, smokers and the obese. With no shortage of these patient types on any ward, I could easily use my MI skills daily."

[UMI01 – Respiratory placement]

"I think that the placement I was on gave me a good opportunity to practise." [UMI12 – Out-patient department placement]

The second facilitator sub-theme identified 'Educator support', is in direct contrast to the lack of support previously identified as barrier. Of those who received support, three students identified that their clinical educators had been on MI courses. Support however, did not depend on whether clinical educators had been on MI courses. One student reported that the physiotherapists at their clinical site were using MI skills unawares to themselves and that the staff were willing to learn about MI from the student. Educator support did not however impact on knowledge or confidence scores.

"I informed my PE and PT of this objective, both of which were extremely supportive... They too had also completed a two day MI introductory course... Plans were put in place to facilitate my objective, with extra time allowed to allocated treatment sessions to practice my MI skills." [UMI01 – Respiratory placement]

"My seniors and practice educators had been on MI courses and were very positive and supportive of its use." [UMI07 – Out-patient department placement]

I found on my particular placement site that the physiotherapists were carrying out some forms of motivational interviewing without actually realising...they were happy for me to use it and were willing to learn more about the concept [UMI06 – Respiratory placement]

The third facilitator sub-theme identified by participants was 'Practice'. Practicing MI skills and techniques identified by students on in- and out-patient placements

"While I was on my placement I used motivational interviewing as often as possible."
[UMI07 – Out-patient department placement]

“Many elements of what I had learnt during the motivational interviewing course could be woven seamlessly into the assessment once practised.” [UMI13 – Orthopaedic placement]

The final facilitator identified was the use of ‘Blackboard’ and the online resources hosted on it. Blackboard was accessed by eight participants during the study, however only six participants commented on it during their reflective writing. No participant provided reasons for not accessing blackboard. The reasons provided for using this resource was for the completion of a presentation on MI and as a reminder or refresher.

“I accessed the information a number of times on Blackboard if I was unsure of any aspects.” [UMI06 – Respiratory placement]

“I used the information on Blackboard for my presentation and found it was very clear and useful.” [UMI07 – Out-patient department placement]

5.4.3.5 Theme 3: Awareness

The third and final theme identified was ‘Awareness’ which included four sub-themes; ‘Importance of effective communication’, ‘Practice methods’, ‘Success’ and ‘Intentions to use’. Awareness of effective communication in terms of positive patient outcome was identified. This sub-theme was identified by participants in hospital based and primary care placements. This importance of effective communication also extended beyond the benefits for patients, to how MI can benefit physiotherapists and also could benefit other HCPs. Awareness of the need for education in motivational strategies was identified and included within this sub-theme.

“It highlights the importance of good communication with patients and the value of their input and ideas... it definitely benefits the patients and promotes self-efficacy which ultimately leads to a better outcome for the patient.” [UMI12 – Out-patient department placement]

"I think that motivational interviewing is a very worthwhile and effective style of communication and would be useful in physiotherapy. I feel that therapists are often guilty of adopting a superior stance over their patients, which renders little results in terms of patient compliance with physiotherapy." [UMI10 – Primary care placement]

"I feel that more supports and in-services should be put in place to encourage all health care professionals to incorporate it into their treatment and care" [UMI01 – Respiratory placement]

"I think a module on MI would be a great addition to the physio course." [UMI02 – Out-patient department placement]

The second sub-theme, awareness of 'Practice methods', included an acknowledgement of previous non evidence-based methods. This awareness also included an awareness of the use of new evidence-based methods. This awareness of how participants had been practicing and how they were practicing after taking the course was identified by students allocated to both hospital based and primary care placements.

"I felt patients were coming to you with the objective of you solving their problem and there would not be a need to get the person to buy into the treatment." [UMI02 – Out-patient department placement]

"I found it difficult at the beginning not to be giving my opinions and to let patients come to their own conclusions." [UMI06 – Respiratory placement]

"I feel my physio practice changed, I now approach the patient more holistically."
[UMI01 – Respiratory placement]

"I feel it changed my communication style to be more patient-focused and helped me to consider the patient as a whole and not just their presenting complaint." [UMI06 – Respiratory placement]

“It changed my practice hugely as it allowed me to approach a patient’s compliance in a different way... This technique worked as the responsibility was then reflected back on them, and it allowed me to not feel disheartened when a patient had not been as compliant as I hoped.” [UMI07 – Out-patient department placement]

The third sub-theme identified was an awareness of their own ‘Success’. This sub-theme included being successful with patient outcomes and included reports of students’ own individual success and that taking the course and using MI skills as part of their practice while on placement was a beneficial experience.

“It did change their adherence and outlook towards physiotherapy and patients really showed improved motivation to change when they realised that this is something they really wanted themselves and not just the health care professionals telling them this is what they should want.” [UMI06 – Respiratory placement]

“I feel that this positively affected my overall marks.” [UMI01 – Respiratory placement]

“I can count it very much a beneficial experience.” [UMI14 – Paediatric placement]

The fourth and final sub-theme identified within the ‘Awareness’ theme was the ‘Intention to use’ MI in the future, which was an opinion held by the majority of participants. This follows on from the reported beneficial experience of taking the course and implementing what they had learnt while on placement.

“I have no doubt that I will carry on using my MI skills on into the future as a qualified physio.” [UMI01 – Respiratory placement]

“This is certainly something I will continue to use in my practice.” [UMI03 – Out-patient department placement]

“I found the skills I acquired after the MI course and throughout my placement will tend to me for the rest of my career, and I will carry them forward with me in the future.”
[UMI07 – Out-patient department placement]

5.5 Discussion

The aim of this study was to investigate the effectiveness of a level one MI course at the entry-to-practice level of physiotherapy education. The results indicate that a 2-day level one MI course can improve physiotherapy students' confidence and knowledge of MI and confidence in improving adherence and eliciting HBC. The effects of completing a 6 week clinical placement directly after the course on knowledge and confidence were mixed, with some students reporting an increase in confidence and knowledge, some reporting a decrease and the majority reporting no change over the 13 questions addressing knowledge and confidence. Results of the analysis of the qualitative data echo the results of the preceding studies in this PhD. Opinions expressed by participants of this study are consistent with those expressed by practicing physiotherapists who were participants of the first two studies in this PhD. Similar themes emerged and comparable barriers and facilitators were identified in this study to those identified in Study II.

As with Study II there are few studies of this nature published involving physiotherapists. Comparison therefore with the literature is limited. There are studies investigating the implementation of MI among HCPs (Duff, 2013, Amodeo et al., 2011, Brobeck et al., 2011, Heaven et al., 2006, Rubak, 2006, Miller and Mount, 2001, Velasquez et al., 2000) with which comparisons will be made. Comparisons will also be made with the only two studies that have been published involving students (Bell and Cole, 2008, Poirier et al., 2004). Both of these studies, however, only included medical students. Comparisons will also be made with the study that is most similar in terms of design and sample, to this study, which is the second study of this PhD.

5.5.1 Knowledge

The results of this study indicate that a 2-day level one MI course is effective in increasing physiotherapy students' knowledge of MI and knowledge of eliciting HBC. This result is consistent with the results of the three studies that informed the construction of the questionnaire (Duff, 2013, Bell and Cole, 2008, Poirier et al., 2004), two of which involved students (Bell and Cole, 2008, Poirier et al., 2004). All three

studies reported greater knowledge post-course (Duff, 2013, Bell and Cole, 2008, Poirier et al., 2004). This result is comparable to the results of Study II where participants reported an increase in knowledge directly after completing the same 2-day level one MI course. In a review of 17 workshops (MI and other models) there was an increase in knowledge after taking a course, although none of the studies included physiotherapists or students (Walters et al., 2005). This review also reported no difference in knowledge gained, based on clinical level or years of experience (Walters et al., 2005). This result is consistent with the combined results of this study and the preceding study in this PhD (Study II). The results of both studies indicate that the MI course was successful at increasing knowledge at both levels of physiotherapy education.

At time-point 3, after clinical placement, there was a slight decrease in the number of correct answers compared to directly after the course. The number of correct answers was however, still much higher than baseline knowledge levels. Time-point 3 occurred 7 weeks after the course so it is not surprising that there was a drop-off in correct answers between time-points 2 and 3. Neither Duff et al (2013), Bell and Cole (2008) nor Poirier et al (2004) re-administered their questionnaire at a later date. It is therefore impossible to compare the effect of clinical placement on knowledge and confidence with these studies. Participants of Study II were followed up at a later date and, similar to this study, participants reported that their knowledge remained approximately the same. The time between the course and the follow-up was, however, twice as long and the method for evaluating knowledge was different.

5.5.2 Confidence

The results in terms of confidence are similar to those of knowledge. Confidence predictably increased directly after the course with a slight decrease at time-point 3. The increase directly after completing the course is comparable to those of Duff et al (2013), Bell and Cole (2008) and Poirier et al (2004) and Study II. Study II offers the best direct comparison as it included a follow-up assessment. The majority of Study II participants reported no increase in confidence at their 3-month follow-up. The slight decrease in confidence reported by the students may suggest an over-estimation of their confidence before attempting to put their new MI skills into practice. Their experiences on

placement, while facilitating and reinforcing what they had learned on the course, may have led them to conclude that there is more to learn and more practice is required, as was the case with participants of Study II. Another possible explanation is that they may have realised that implementing MI with real patients is more difficult than role-playing. This is reflected in the qualitative data where lack of confidence was identified as a barrier to the implementation of MI. Of those students who reported a lack of confidence all but one had a drop in their average score for the questions regarding confidence at time-point three.

Confidence was highest at baseline for the ability to develop MI skills, in the ability to introduce oneself to a new patient and in the ability to express empathy. These results are consistent with those reported by Poirier et al (2004) where participants were most confident at baseline in the ability to introduce oneself to a new patient and in the ability to express empathy. Direct comparison between this study and Poirier et al (2004) is difficult as Poirier et al (2004) included first year medical students who would not have had similar clinical experiences and exposure as final year physiotherapy students entering their final two clinical placements. Final year students have already experienced patient-therapist interaction, introducing themselves to patients and expressing empathy. This may explain their initial confidence and therefore confidence levels at time-points 2 and 3 may not be entirely attributed to the MI course. This is a positive result considering empathy was identified by patients (Potter et al., 2003b) and physiotherapists (Aguilar et al., 2013, Association, 2009) as a key value for physiotherapists in motivating patients (McGrane et al., 2014). Poirier et al (2004) reported the least confidence in understanding of the key concepts of MI. This result is again similar with the current study, with the lowest confidence in MI skills reported at baseline; only slightly lower than confidence in understanding of the key concepts of MI. Both of these showed the greatest improvement after the course. The low baseline confidence is to be expected as the students had yet to receive any MI training.

5.5.3 Barriers and facilitators

The barriers and facilitators identified by participants are the same as some of those identified by participants of Study II. Feasibility (the opportunity to practise MI and the availability of suitable patients) was identified in both studies as both a facilitator and a barrier. The identification of this barrier is reflected in the literature where a lack of opportunity to practise MI was reported as a barrier among social care workers (Velasquez et al., 2000) and the opportunity to practise was seen as a requirement to deepen knowledge of MI and to learn from mistakes in a study of nurses (Brobeck et al., 2011). Feasibility is also reported as a barrier in studies involving physiotherapists. These studies however involved the application of clinical instrument measures (Swinkels et al., 2011) and the use of evidence in practice (Jette et al., 2003). In order to facilitate implementation students should ideally be provided with the caseload that provides them with an opportunity to practice MI. Some clinical placement sites however offer more opportunities than others depending on the patients attending at the time students are present. It would be difficult to predict the caseload of clinical sites as students reported feasibility issues in a range of placement sites. This is similar to Study II where participants reported patient suitability as a barrier to implementing MI in a range of workplace and clinical settings. Overcoming this barrier by accommodating every student with a placement that offers the opportunity to practise MI skills directly after an MI course will be difficult given the complexity and inflexibility in organising placements and the fact that it is impossible to predict whether patients will require MI. It would however be more appropriate to incorporate the teaching of MI skills throughout the entry-to-practice course. This study dealt exclusively with MI, there are however other evidence based-theories that foster behaviour change (Chapter 2 Part A). The inclusion of education on these theories and the skills, many of which are similar to MI (Chapter 2 Part B), involved would only be of benefit for students and ultimately patients. Every student would therefore be practicing appropriate communication skills on every placement as evidence-based communication skills would be taught throughout the course.

Support was identified as a facilitator and the lack of support as a barrier by participants of both this study and Study II. The type of support however differed between the studies. Students identified support from educators while peer support was identified by qualified physiotherapists. As discussed in Chapter 4, lack of colleague involvement was reported as a barrier to implementing MI among dieticians (Whitehead et al., 2009b) and dentists (Rosseel et al., 2011). A lack of peer support was also reported as a barrier to the implementation of evidence-based instrument measures among physiotherapists, specifically a lack of discussion and feedback. Physiotherapists in a study by Jette et al (2003) received support from their colleagues and therefore did not identify lack of peer support as a barrier to the use of evidence in practice. However, they did not identify it as a facilitator (Jette et al., 2003). As and when motivational interventions and evidence-based communication methods become the norm among the profession, support will be more prevalent. This is already evident as students who had educators who were familiar with MI reported educator support as a facilitator. Increased support may facilitate more practice of MI skills by students, which was also identified as a facilitator, which may in turn increase confidence in the use of these skills.

As discussed in Chapter 4, time is a common barrier to implementing MI as reported in studies involving nurses and social care workers, dentists, mental health professionals, physicians, dieticians and members of a cystic fibrosis MDT (Velasquez et al., 2000, Brobeck et al., 2011, Rosseel et al., 2011, Midboe et al., 2011, Whitehead et al., 2009b, Duff, 2013). Time is also a barrier to the implementation of new evidence-based practice methods (Zidarov et al., 2013, Swinkels et al., 2011, Jette et al., 2003). Time was recognised by some educators as a barrier, and extra time was provided to students to practice their MI skills. Providing extra time to students is normal practice when facilitating the learning of a new skill.

Reviewing course material was identified as a facilitator by participants of Study II and online resources were mentioned as a potential facilitator of further MI learning by members of a cystic fibrosis MDT (Duff, 2013). It was for these reasons, and to enable peer support, that resources were hosted on Blackboard. Given this evidence, the use of Blackboard was lower than expected with no students participating in the discussion

board and 38.5% (n=5) not accessing Blackboard at all. Of the students who made use of Blackboard as a resource each only accessed information once. It is however conceivable that students downloaded and saved the material accessed, negating the need to log-on for a second time. The reasons students did not access Blackboard at all or did not participate in the discussion board were not provided in the reflective reports. One can only speculate, therefore, as to the reasons behind this. Students may have discussed MI with fellow students who were allocated to the same site or discussed with the physiotherapy staff. Students may have discussed MI on a different platform, such as part of a Whatsapp group or a Facebook group, the use of these other platforms were however not reported. Students may not have wanted to join the discussion as they knew that it would be monitored by the author (NMG) or students may have had other more pressing demands on their time and therefore neglected Blackboard. Further research into students' use of online resources is warranted to investigate motives for the use or non-use of resources of this nature and to investigate how students discuss the acquisition of new skills among themselves. Those students who did access resources on Blackboard commented on its usefulness as a reminder and for the preparation of a presentation on MI.

The remaining barriers identified by participants of Study II, mental effort and breaking old habits, were not identified by the students participating in this study. Students at this stage of their training are establishing their communication methods and may not therefore have old habits to break. Intellectual demands of the physiotherapy course has been shown to be a cause of stress for students (Walsh et al., 2010) and the mental effort involved in learning is already part of a students' experience of placement. This may be the reason that students did not identify it as a barrier as qualified physiotherapists in Study II did.

5.5.4 Awareness

The final theme to emerge from the analysis of the qualitative data was 'Awareness'. This theme and its sub-themes are consistent with the results of Study II where participants gained a self-awareness of their practice methods. Students also gained a self-awareness of both their old and new practice methods. A recognition of the gap in

practice and how the profession must evolve to include evidence-based methods for increasing adherence and eliciting HBC was identified in both studies. Students identified the need for education in this area of practice which is consistent with the results of Study I and Study II of this PhD. Students also demonstrated an awareness of the benefits to patients and the benefits to therapists; results which are consistent with Study I and Study II. There is further evidence of the recognition of the importance of effective evidence-based communication methods in the students' intention to use MI in the future.

5.5.5 Implications for education

This study indicates that MI taught in a 2-day workshop format is successful at increasing knowledge and confidence among physiotherapy students. This format may be impractical for students, as seen by the low numbers of volunteers for the study, and for physiotherapy educational institutions. A more practical method of delivery would be to incorporate MI throughout the curriculum and provide MI education in smaller blocks during normal timetabling. The complications of providing appropriate clinical placements to students emphasises the need to incorporate the teaching of communication skills throughout the course. This will provide students will opportunities to practice with suitable patients. This method of MI delivery was employed by Bell and Cole (2008) and Poirier et al (2004) and their results are consistent with the results of this study, indicating that education in this format would also be successful for physiotherapy students.

Barriers identified by students in this study can provide guidance for action to accelerate the implementation of MI into practice (Amodeo et al., 2011). Further training and supervision is required to ensure new skills and practice methods are maintained (Amodeo et al., 2011, Brobeck et al., 2011, Walters et al., 2005, Heaven et al., 2006, Miller and Mount, 2001). This supervision and support will become more frequent with increasing numbers of practice educators and physiotherapists completing courses and become more familiar with MI methods. There is a need however to prioritise education of supervising physiotherapists, practice educators and clinical tutors to ensure students are provided with the correct guidance and support in MI techniques while on clinical

placement. The education of student physiotherapists in effective evidence-based motivational techniques should be afforded the same resources, time and effort as any other new skill taught during the curriculum and while on clinical placement. A present limiting factor to the integration of MI into the curriculum, however, may be the identification of faculty who are adequately trained to educate on MI techniques.

5.5.6 Limitations

Some methodological limitations should be considered when interpreting the results of this study. A self-selection bias may be present as participants volunteered for this study. This may have resulted in students who are interested in the area volunteering or may have resulted in the more diligent students volunteering. The presence of a self-selection bias may have led to the presence of a confidence bias (Pallier et al., 2002). The reported confidence levels may be an over-estimation, enhanced, or not, by the presence of diligent students. This potential over-estimation was also reported by Poirier et al (Poirier et al., 2004). The reported confidence levels may be an over-estimation as a result of an attempt to be seen as a diligent student or as a result of an obsequiousness bias (Cook, 2010). An effort to limit the presence of this bias was made by clarifying to students that their responses would be coded and that access to all information would be restricted to NMG only. Using a Likert scale from 1-5 may have provided participants with too few options to accurately judge their confidence and limited the detectable change. It was however same scale used by Piorier et al (2004). A bias many have been introduced into the reflective writing essays, as the instructions provided to students may have framed their responses.

The questionnaire used in this study included questions that may not be entirely focussed specifically on skills and knowledge directly attributed to MI, questions such as confidence in ability to introduce oneself to a new patient. The students involved in this study were final year students who had completed all but two of their clinical placements and had completed three years of the physiotherapy course. Students may have already developed and established these skills prior to taking this course and may, therefore have resulted in the reported high confidence.

Low numbers of volunteers limited the statistical power of the study. The low numbers may be a result of the course taking place outside of term time on two weekdays. Many students reported that they would like to partake but could not as they would be travelling or that they could not afford to take time off from summer jobs. An effort was made to accommodate as many interested students as possible. The low numbers however make further statistical analysis redundant.

Final year students were included in this study and half of the sample completed their final patient assessment during the placement. The final patient assessment is a clinical examination that takes place on either of the final two placements and contributes to the final year grade. As students are evaluated on their performance while on placement, this may have lowered their incentive to implement MI. Students may have focused instead on meeting targets and completing the assessed competencies in order to achieve high marks. The completion of the questionnaire and reflective report was an additional task placed on top of existing course work and preparation for their final clinical placement and final patient assessment preparation. These extra demands may account for a drop in questionnaire scores at the final time-point and the one incomplete reflective report.

5.6 Conclusion

The implementation of evidence-based methods to motivate patients and to elicit health behaviour change within the physiotherapy profession is warranted, as discussed in Chapter 3. The results of Study II indicate that the current format of CPD is successful. This study is the first of its nature among physiotherapy students. It indicates that the same 2-day level one MI course, as investigated in Study II, is successful at improving knowledge and confidence in MI among student physiotherapists. The format, however, requires tailoring in order to fit into the entry-to-practice curriculum and timetable. The up-skilling and education of educators is required to facilitate the integration of motivational interventions into education and therefore practice. This will necessitate the provision of resources within both educational institutions and clinical placement sites.

Chapter 6. Conclusion and implications of this research

6.1 Introduction

The concluding chapter of this PhD will draw together the results of the research conducted and explore their implications. Epidemiological trends make it clear that healthcare in the 21st century will be dominated by the escalation in chronic lifestyle-related conditions (Dean, 2009a). As a result, the focus of healthcare delivery is evolving from treating illness to the promotion of health (Department of Health, 2013, Department of Health, 2012). This evolution places an increasing importance on communication to elicit health behaviour change (HBC) and is particularly relevant to the physiotherapy profession. The research conducted in this PhD indicates that the manner in which physiotherapists currently communicate with patients is no longer optimal. The results of this research indicate that a paradigm shift in how the physiotherapy profession communicates is now required to bring about behaviour change and reduce the impact of the growing problem of chronic lifestyle-related illnesses. Possessing the knowledge and skills to assist patients with change and to assist them in adhering to physiotherapy has been recognised as a key clinical competency for the profession (Dean, 2009b). To be truly patient-centred and to succeed in an evolving healthcare environment, a new approach to communication is required. The current approach, where physiotherapists 'fix' patients, will be replaced with an approach focused on the evidence-based methods of collaboration with and empowerment of patients to explore their own solutions and take responsibility for their own health.

This shift in communication practice has implications, and will require action, at different levels of the physiotherapy profession. Each of these levels, the individual, educational, organisational, and global will be discussed in turn. In their recent seminal Founder's and McMillan Lectures held to provoke thought and call for change within the profession, Dr. Middleton and Dr. Nelson highlighted the need for evolution to occur; at

the individual practitioner level, in the education system and in professional associations (Middleton, 2014, Nelson, 2013). They believe that now is the time for the profession to lead the way in healthcare becoming more preventive and holistic. The physiotherapy profession is in the ideal position to lead this change, yet action is required to ensure the profession maintains this position. There are no physiotherapists representing the profession on the 37 member Healthy Ireland Council. There is also a rise of other professions in the exercise and activity sector who may adopt HBC communications models more effectively than physiotherapists. Urgent action is therefore required to ensure the success of the paradigm shift in physiotherapy communication, thereby ensuring the position of the profession at the forefront of HBC in 21st century healthcare.

There have been successful paradigm shifts in physiotherapy practice before. The design and use of outcome measures was called for in the 1980s and 1990s following initial development in the 1950s (Kidd and Yoshida, 1994). Papers published in the 1980s highlighted the need for valid and reliable outcome measures in physiotherapy practice (Partridge, 1982, Tallis, 1988). A similar study to Study I of this PhD was published in 1993 identifying current practice in the use of outcome measures (Mayo, 1993). The results of this 22 year old study are consistent with Study I, where participants acknowledged the need for change and education in the use of outcome measures (Mayo, 1993). The physiotherapy profession recognised the need to base practice on evidence in the 1990s and this was a priority of action for the profession during that decade (Parker-Taillon, 2002). Papers published in the 1990s detail the implications of evidence-based practice for physiotherapy and called for the profession to conduct research on practice and outcome measures (Twomey, 1996, Partridge, 1996, Jette, 1995). The success of these practice changes are evident, it would be difficult for currently practicing physiotherapists to imagine a profession not based on and educated in the use of evidence and reliable outcome measures.

The research conducted in this PhD, at its core, is about trying to learn how physiotherapists can successfully motivate patients to make positive changes to their health. Firstly, evidence-based methods, such as motivational interviewing (MI),

cognitive behavioural change, social cognitive therapy and self-determination theory, to improve adherence and elicit HBC were identified and explored. Following this, the first study of this PhD evaluated how physiotherapists are currently practising in terms of improving adherence and eliciting HBC. Results indicated that up-skilling and education on evidence-based communication strategies are required and that this is recognised by the profession. Despite this recognition, however, those who have completed courses to improve their communication skills are in the minority, demonstrating the need for change. The final two studies of this PhD focused on strategies to deliver education in this area and involved in-depth study of the implementation of an evidence-based communication intervention, MI. There is extensive evidence for the use of MI in healthcare (Lundahl et al., 2010) and of those Study I participants who had completed continuous professional development (CPD), MI was identified as the most popular choice. Study II investigated CPD in its current format, a level one MI course. Study III investigated the same format of education at the entry-to-practice level. Both of these studies identified barriers and facilitators to the successful implementation of MI that have implications for the profession.

To bring about the change in how physiotherapy communication is currently undertaken, action is required to embed appropriate evidence-based practice methods throughout each level of the profession. The eight-step process to transforming an organisation, as proposed by Dr. John Kotter, can provide a useful framework, demonstrating how these practice changes might be embedded throughout the profession (Kotter, 1995). These steps demonstrate how establishing a sense of urgency, effective leadership, developing and communicating a vision and strategy, empowering for action and consolidating and anchoring new approaches within a professional culture can bring about a permanent transformation. Although not aimed specifically at healthcare, this model is recognised as a leading source of change management and implementation and has been advocated as a method to bring about change in healthcare (Campbell, 2008).

6.2 Implications for the individual

Study I clearly indicated a recognition at the individual level of the need for changes to practice and for educational change in the profession. This study also indicated that it is also at the individual level where action is taking place. The second and third studies focused further on this and identified specific barriers and facilitators to the implementation of MI into practice that will have implications for individual physiotherapists. Barriers included time, feasibility, breaking old habits and the mental effort to do so, and lack of support. Facilitators identified included reviewing educational material, the ability to practice new skills, feasibility, support, and being mindful to use newly learned skills.

The first barrier, time, was identified as a barrier in all three studies and has frequently been identified as a barrier to the implementation of MI by a range of healthcare professions (Velasquez et al., 2000, Brobeck et al., 2011, Rosseel et al., 2011, Midboe et al., 2011, Whitehead et al., 2009a, Duff, 2013). Time has also been identified as a barrier to the implantation of new practice methods by physiotherapists (Zidarov et al., 2013, Swinkels et al., 2011, Jette et al., 2003). The concern among physiotherapists that learning to use and incorporating MI skills into practice will impact on time is valid, but in reality should only be an issue in the short-term. When evidence-based communication skills are fully engrained into practice they will have a positive effect on outcomes making time use more efficient. The profession will be promoting health in an effective way and time will not be wasted on methods that do not work. Planning and scheduling may be one means to alleviate initial time issues. Patients predicted to need greater input in terms of promoting HBC could be scheduled during less busy times in the period when communication methods are initially changing and being learned by individual practitioners for example. The more practise that individuals get, the easier and faster it will be as the new skills and communication methods become engrained into practice. The barrier of time will therefore become less of an issue.

Another barrier brought to light in Studies II and III was that to become competent and confident in the use of HBC methods individuals require the opportunity to practise new skills with suitable patients. Having the opportunity to practise with suitable patients

was identified as a facilitator while a lack of opportunity was identified as a barrier. To address this, it would be ideal, particularly for basic grade physiotherapists, to schedule CPD courses before they rotate into an area where there are plenty of opportunities to practise. Senior physiotherapists working in areas with suitable patients will also require up-skilling in order to promote, support and educate junior staff and for the optimal care of their own patients. If opportunities are lacking, participants in the studies suggested that individuals can practice in a non-clinical setting, and this creation of opportunities to practise was identified as a facilitator in this research. Practising with colleagues, friends and family will provide extra opportunities to consolidate new communication methods. A lack of opportunity is also an ideal means of implementing policies such as 'Make Every Contact Count' (de Normanville et al., 2011), and would provide individual physiotherapists with the opportunity to practise during every patient contact. It has been suggested that even when illness or disability is the reason a person seeks treatment from a physiotherapist, their health priorities should be addressed irrespective of their diagnosis (Dean, 2009b). Practising skills such as use of open-ended questions, reflective listening and summarising can be done with all patients, as can improving self-efficacy, promoting autonomy and empathising with patients.

Breaking old habits, and remembering to do so, were identified as barriers in the studies and will be different for each individual. Physiotherapists who have been taught to focus on clinical and manual skills and prescribe treatment and exercise could facilitate the change in practice by using reminders or other supports and this was identified as a facilitator in Study II. Once new habits in communication are established the mental effort required to be mindful will ease. Participants of Study II identified tiredness and frustration as particular challenges that increase the likelihood of slipping into old habits. As with the time barrier, planning, scheduling and the use of reminders, especially during the learning period, may assist individuals in breaking old habits. If patients who require a lot of intervention for HBC or adherence are given appointments at times when an individual physiotherapist knows they are at their best, it may decrease the chance of slipping back into for example coercive or dictating communication methods. As evidence-based communication becomes established throughout the profession the need to be mindful will decrease and more support from

colleagues will be available. With practice, as with the barrier of time, old habits will dissipate and new communication skills will become easier and more natural.

The onus is on each individual to comply with recommendations and guidelines and to recognise gaps in their own knowledge and skills. It is up to the individual to address any gaps in their practice, embrace change and overcome any personal barriers to ensure that they are providing a truly patient-centred and evidence-based service. Peer support was identified as a facilitator and this can be utilised to the fullest through effective leadership to encourage individual physiotherapists to utilise best practice methods. Individuals who have already recognised the need for change and have taken action to evolve their practice have an opportunity to take responsibility and lead their colleagues by example. It has been shown that clinical level and years of experience had no effect on knowledge gained after completing a HBC course in a range of professions (Walters et al., 2005). This finding is consistent with the findings of this research. Leaders for change can therefore emerge from all levels of the profession, from clinical specialist to newly graduated basic grade physiotherapists. Organising review and practice sessions among colleagues will provide continued support. It was also found in Study II that a refresher course assisted with implementation. If a refresher course is unavailable individuals can organise their own refresher meetings. Colleagues could form review groups, using time set aside for education to review and discuss the material together. Peer support will become increasingly common as more individuals change their practice and can assist others to do so.

6.3 Implications for education

Education will be the driving force behind the transformation of physiotherapy practice. Education of physiotherapists, both at the professional level and at the entry-to-practice level, is therefore an important area for research. It was recognised by participants of the studies in this PhD that the current education system will have to change to incorporate new communication methods to enable physiotherapists to practise in a patient-centred and evidence-based manner. Study II and Study III focused specifically on education. Any change to how a profession practises will face challenges, it was

therefore important to identify specific barriers and facilitators relevant to physiotherapists. These barriers and facilitators can now be used to guide action for the profession to assist with the transformation in practice.

Looking specifically at higher education institutions, this research suggests changes are required in the undergraduate curriculum. Timely introduction of this topic in the curriculum will mean evidence-based communication methods are embedded from an early stage. Providing students with a solid base in the understanding of behaviour change and various HBC theories in the classroom will establish and stress the importance of this area, ensuring it becomes the standard approach. Putting the same emphasis on appropriate communication skills as is put on clinical skills during undergraduate training will further highlight and embed this as a standard of care.

As part of the current PhD, a 2-day MI course was undertaken by entry-to-practice physiotherapists before clinical placement. This means of delivery of training in the area was seen as beneficial and effective by the students who undertook the course. This method of training, however, may not be feasible. Weaving HBC methods and skills into the curriculum is more practical and appropriate and has been successful with medical students (Bell and Cole, 2008, Poirier et al., 2004). Educating students on HBC theories, methods and skills may require the development of a new module. This module would need to incorporate the origins of HBC theories and the development of and theory supporting these HBC models to foster a full understanding of each theory. Factors that influence motivation and the psychology of chronic lifestyle conditions would need to be addressed to allow full understanding behind patient choices. This understanding will foster empathy among student physiotherapists for patients. This module would have to incorporate group discussions, practical skills exercises and multi-media presentations of examples of HBC skills. Prioritising education on HBC skills in educational institutions will require a review of the curriculum, the identification of faculty, hiring new staff or training existing staff to educate students in these methods (Whitehead, 2015). Inter-professional education could play a role, as other HCP training courses have already embedded HBC training in their curricula (Trinity College Dublin, 2015). This is an area

where physiotherapy educators have an opportunity to lead the way and encourage other HCPs to take on motivational HBC techniques.

In addition to undergraduate training in the classroom, clinical placement is a vital component of education and is delivered by practicing physiotherapists. Support from practice educators was identified as an important facilitator by students participating in Study II. The training of practice educators and clinical tutors in HBC methods is therefore key. Collaboration between higher educational institutions and clinical placement sites will be necessary to ensure physiotherapists involved in the education or supervision of students are sufficiently trained. Prioritising the training of clinical tutors and practice educators will ensure that students can observe these skills in practice, get the support and guidance required and be accurately assessed. As with the curriculum, putting the same emphasis on appropriate communication skills as is put on clinical skills during clinical placement will embed this as the standard approach for students. All the resources that are afforded to students when learning a new skill while on placement, such as extra time to practice and identifying suitable patients with which to practice, should be afforded to the learning of HBC and communication skills.

Grading of HBC skills will be required as part of both curricular and clinical placement training, as it is with other skills (Parry and Brown, 2009). Written examinations however, cannot be assumed to have any relation to actual communication skills in practice (Parry and Brown, 2009). Clinical placements will, therefore, play a central role, not only in the education of communication skills but also in their assessment (Parry and Brown, 2009). Individualised feedback from experienced practitioners will be particularly important (Parry and Brown, 2009). As HBC skills become part of students' clinical placement assessments there is a requirement that those grading and providing feedback be capable themselves (Parry and Brown, 2009). For other HCPs, it has been suggested that training and assessment of HBC skills is a necessity, as described in a study of practising dieticians (Whitehead, 2015). This is equally applicable to physiotherapists.

Study II of this PhD identified barriers and facilitators to the successful implementation of a method of motivational communication among already qualified and practicing

physiotherapists. Keeping up to date with training and up-skilling in light of new evidence is a fundamental part of being a professional physiotherapist and participants in this study regularly undertook CPD training of various types. In Study II, a level one MI training course was evaluated to determine what the challenges and facilitators of implementing HBC skills after training might be.

For the physiotherapy profession to transform how it communicates with patients qualified physiotherapists will need HBC training as part of ongoing CPD. A barrier identified by these physiotherapists was the breaking of old habits. This was important for practising physiotherapists who may have spent many years focusing on manual skills and prescription while overlooking how they communicate. Changing entry-to-practice physiotherapy education will prevent newly graduated physiotherapists from having to break old habits and the mental effort, perceived as a barrier, which this entails. There is, however, also a need for practising physiotherapists to develop their HBC communication skills, both for the benefit of their patients and to enable them to train junior colleagues and provide peer support. The results of Study II indicate that the current method of professional development in this area is successful.

A facilitator to learning HBC skills that could be implemented in workplaces was identified by practising physiotherapists in study II. This is the provision of written material in the area of HBC. Reviewing course material was identified by participants in the studies as a helpful factor in learning and implementing new skills. Accessible educational resources for other subjects are common in some workplaces, such as access to databases, journals and libraries. Study participants found repeated reviewing of written material after the course was important to fully implement all aspects of the training. This would be simple for workplaces to implement. The expansion of these resources to include HBC communication material will assist with the implementation of evidence-based communication skills.

The participants in study II recognised the need for training in motivational techniques. There is a need, however, for physiotherapists to recognise the importance of training in motivational techniques for their practice and to prioritise such training. For practice to change physiotherapists should not allow CPD course in this area to be side-lined by

more traditional CPD courses, such as those offered in manual therapy skills. A mind-set shift to one that prioritises HBC training will benefit practicing physiotherapists, their patients and students under their tutelage.

Overall, it is clear that education in the area of HBC training for physiotherapists will be required to change. There are challenges to the provision of this education at all levels; in workplaces, clinical placement sites and higher education institutions. There is a recognised difficulty in transferring training into practice (Heaven et al., 2006). There is also a challenge in how to accurately assess these skills for both students and practitioners. Sourcing funding, resources and facilities necessary to facilitate and implement changes to the education system will be a challenge for individuals, educational institutions and workplaces. Funding is, however, being provided by the state for CPD courses for physiotherapists. The course investigated in Study II was funded by the Health & Social Care Professions Education & Development Unit of the Health Service Executive. Despite these challenges the results of Study I and Study II indicate that physiotherapists are capable of implementing evidence-based HBC communication strategies into practice.

6.4 Implications for organisations

Physiotherapy professional organisations, workplaces, educational organisations and government health departments have a central role to play in enabling changes to professional practice to be realised. Government bodies develop overarching health strategies and can provide funding and infrastructure to deliver on these. National professional associations and workplaces can influence government policy and lobby the state for the funding and resources requirements in making the transformation in practice methods. They therefore have a key role to play in realising government strategies by promoting and leading practice development. A number of barriers and facilitators applicable to the organisational level were identified in the current research and can be addressed by these organisations.

A barrier that was common in Study II and III and is recognised in the literature was that of lack of time. Physiotherapy managers can help address this at the organisational level

by ensuring adequate staffing levels are maintained. Time pressures are becoming more prevalent, however, with increased workloads and understaffing due to budgetary constraints within the Health Service Executive (HSE) due in part to a decrease in public expenditure in healthcare since 2009 (Health Service Health, 2014). Campaigning for appropriate staffing levels nationally by professional organisations may also assist in alleviating time pressures.

Lack of opportunity to practice was identified as a barrier in this research. Simple strategies, such as 'Make Every Contact Count' (de Normanville et al., 2011), could be implemented within organisations to overcome this. This will provide staff with opportunities to practice health promotion with every patient.

Another facilitator identified in this research was peer support. Peer support amongst colleagues in an organisation could be promoted by nominating enthusiastic individuals to train, support and lead their peers. Introduction of mandatory assessment on HBC and communication skills could be a way to ensure staff members are not left behind as practice continues to evolve. Peer support in the form of discussion forums or similar networks would support the implementation of HBC skills. These forums or networks could be formed within workplaces, within a geographical area or with the assistance of national associations. National organisations could help establish a clinical interest group in this area to further facilitate peer support.

If HBC communication skills, such as MI, are to be recognised as central to physiotherapy practice going forward workplaces could use strategies to promote a change in communication methods. Workplaces could utilise professional development in-services, journal clubs, tutorials and practice or role-playing sessions for the promotion of change among staff. Providing access to educational resources and providing adequate private consultation areas will make use of a facilitator and address a barrier identified in this research. Workplaces can assist with the transformation by making their staff aware of practice guidelines and recommendations and by introducing mandatory assessment on HBC and communication skills.

National physiotherapy associations in Australia, Canada and the USA advocate the promotion of health and disease prevention as part of physiotherapists' scope of

practice (Australian Physiotherapy Association, 2008, Canadian Physiotherapy Association, 2006, American Physical Therapy Association, 2001) as does the World Confederation for Physical Therapy (World Confederation for Physical Therapy, 2011b). National associations are well placed to communicate the vision of the growing need for effective communication to promote HBC among physiotherapists. Professional bodies can promote the development of practice through fostering of research and publications in the area. The role of professional journals is to disseminate research findings, assist in the move towards evidence-based practice and underpin the scientific and theoretical basis of the profession (Refshauge, 2002). Research into the application of HBC by physiotherapists should be supported by national associations so the profession can continue to grow an evidence base in this area. Conferences organised by professional associations provide researchers with the opportunity to disseminate their research to physiotherapists. Conference themes relating to HBC will promote greater awareness in the profession.

National professional associations have the power to tackle some of the institutional barriers identified in Study II that individual physiotherapists may not be able to overcome on their own. Lobbying for the provision of private consultation areas in new and existing physiotherapy departments could help to overcome the barrier of lack of privacy. Other HCP governing organisations have produced guidelines for the provision of private consultation rooms (Pharmaceutical Society of Ireland, 2010) and similar guidelines could be helpful for physiotherapy practice.

At a government level, the Irish Department of Health's 'Future Health' framework outlines actions required to reform Irish healthcare (Department of Health, 2013). Physiotherapy organisations can influence national policy by creating awareness of requirements to successfully implement such a framework. Physiotherapy organisations can make the Department of Health aware of the facilities and resources, as identified in the studies included in this thesis, required to deliver the transformation of physiotherapy practice to ensure that the profession is practicing in line with policies and frameworks

There is evidence that some of the strategies discussed here are already being put in place by national organisations in terms of CPD courses, conference themes and initial research in the area. In Ireland the Irish Society of Chartered Physiotherapist (ISCP) is active in sourcing funding for CPD courses for its members and organised the MI course investigated in Study II. Furthermore, the ISCP provided a workshop at their annual conference in 2013 entitled 'Focused Communication to Improve Outcomes'. Internationally, the Chartered Society of Physiotherapy (CSP) in the UK have also recognised this with the themes of their 2015 conference being 'Leading change', 'Research into practice', 'Public health, prevention and well-being' and 'Workforce development'.

There are, however, areas that still need support from national organisations. National organisations have a role to play in the establishment and development of education at the professional level and at the entry-to-practice level. As part of its accreditation process for entry level degree courses, the ISCP could work with third level institutions to promote changes in education and practice in HBC.

Before any of these strategies can be implemented, effective leadership by physiotherapy professional organisations is required to create a clear vision for change, communicate this vision and increase recognition within the profession that change is required. A sense of urgency is required due to the rise of other professions taking on roles in exercise, activity and health promotion. Effective leadership is therefore required to ensure the success of the paradigm shift in physiotherapy communication and to ensure the position of the profession at the forefront of health promotion. Support and cooperation between government, organisations, educators and individuals will be required to overcome barriers and make use of facilitators to the successful implementation of new communication strategies.

6.5 Implications for future research

The overall aim of this PhD was to investigate the use of motivational strategies by physiotherapists in the promotion of HBC. The studies conducted indicate that a paradigm shift is required in how the profession improves adherence and elicits HBC.

The research revealed areas that require further investigation. The PhD provides an in-depth evaluation of one potential method of education delivery in this area, at both entry-to-practice and the professional level. Research is warranted to further investigate this type of HBC education and to explore other possible methods of delivery. There is a need to develop assessment and evaluation tools to assess the use of HBC and communication skills for physiotherapists. An evaluation tool would facilitate education development by revealing if graduating physiotherapists and current practitioners are adequately trained in HBC communication techniques.

The evolution of the healthcare environment and healthcare reform requires physiotherapy leaders to raise the profile of the profession, improve practice in line with emerging evidence and create a sustainable professional future (Desveaux and Verrier, 2014). The implications of this research highlight the need for effective leadership throughout the profession to achieve the required change throughout the profession and tackle the barriers identified by this research. The need for effective leadership was called for by Dr. Middleton in her recent Founder's Lecture (Middleton, 2014). There is therefore also a need to research leadership within the physiotherapy profession (Desveaux et al., 2012), to ensure that the profession can maximise influence within the healthcare system to address barriers and facilitators identified by this research to effectively transform practice.

6.6 Key actions to address profession-wide change

A paradigm shift in how the physiotherapy profession communicates with patients is required to deliver evidence-based motivational approaches. A number of key actions are recommended based on the results of the current PhD:

- Global physiotherapy leadership must create and communicate a vision, strategy and a sense of urgency for the need for change.
- National associations, regulatory bodies and government bodies must continue to develop policy, source funds and resources, and promote change in practice. Barriers and facilitators to change identified in the studies of this PhD may help guide this development.

- Educational institutions and clinical placement sites must collaborate effectively to educate skilled physiotherapists confident and competent in motivating patients to change their behaviours. Faculty and staff involved in the training of students must be targeted for coordinated up-skilling in order to begin training students immediately.
- Physiotherapy workplace managers must facilitate training and implementation for practicing physiotherapists by acting on barriers and facilitators.
- Individuals must take responsibility for provision of evidence-based practice and lead and support colleagues with change.

If these actions can be put in place, a new patient-centred evidence-based approach will be anchored within all levels of the physiotherapy profession.

6.7 Conclusion

To conclude, the physiotherapy profession is in the midst of an evolution and the profession itself must adapt for the benefit of patients and the long-term benefit of the profession. Physiotherapists have a unique role in healthcare and are uniquely positioned to deliver HBC strategies with patients. The research included in this thesis indicates that motivational interventions can have a positive effect on adherence and HBC. The second and third studies of this thesis indicate that current education in the area, in the form of a CPD 2-day MI course is successful and that student physiotherapist can implement MI into practice. The studies included indicate that the profession, as it currently stands, may not possess the skills or knowledge to properly assist people to change their behaviours. The participants of these studies, however, may not represent the entire profession. A paradigm shift is necessary to address this deficiency. A sense of urgency is required to move the profession away from using coercive, informational and expert power and move it towards patient-centred evidence-based methods, such as improving self-efficacy, being empathic, promoting autonomy and empowering patients. A clear vision and strategy at all levels is necessary to anchor this new approach within the culture of the profession.

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