Early development of a web-based resource for individuals with non-specific chronic low back pain: An action research-inspired approach

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ABSTRACT

Title: Early development of a web-based resource for individuals with non-specific chronic low back pain: An action research-inspired approach.

Background: Non-specific chronic low back pain (CLBP) is costly to both individuals and society. It is a difficult condition to treat, as there is no readily identifiable pathological explanation for the pain individuals experience. In addition, no definitive treatment exists, since most treatments have limited impact on the condition. Appropriate management has the potential to reduce the number of people with disabling long-term CLBP, and so reduce its personal, social and economic impact. This is especially true in chronic conditions such as CLBP, where individuals, rather than health-care practitioners, make the day-to-day decisions about how to manage their conditions.

To address the need to self-manage conditions, the latest guidelines recommend a combination approach to treatment, which includes a biopsychosocially based educational component. This educational component may aim to provide self-management strategies or address common misconceptions surrounding what CLBP is and how best to manage it. The problems associated with providing an educational component within private practice include the time and costs involved, as well as the need for specialist training in how to provide the education. One approach to overcoming these obstacles is to provide the educational component through a web-based medium.

The internet is increasingly being favoured as a medium for the delivery of health-related education topics due to its versatility and the low costs associated with delivery.

Purpose: This study conducted an initial exploration into what content should be included in a web-based educational resource for individuals affected by non-specific CLBP. In addition, a preliminary investigation into the design of the presentation of the resource was performed.

Methods: An action research-inspired method was used. Interviews were conducted using a semi-structured interview approach. Three groups were interviewed: 'expert practitioners', 'experts in on-line education and web design' and 'individuals with non-specific CLBP'. Expert practitioners were interviewed until data saturation was reached, while the latter two groups were interviewed until repetition occurred. Due to time and resource constraints, it was not possible to conduct all interviews until data saturation. The interview responses were instrumental in constructing what

material should be included in the content of a web-based resource, as well as providing a starting point for how the content should be presented.

Results and discussion:

Content: The main issue identified was the need to reconceptualise the purpose of treatment. In chronic pain, treatment focuses on 'management' rather than 'cure'. Two main components of education were identified: self-management and reconceptualising pain. The expert practitioners identified a number of techniques that they considered to be useful in assisting an individual to self-manage their CLBP. These included techniques such as sleep management, relaxation techniques, activity management, and medications management. Reconceptualising the meaning and purpose of pain was viewed as necessary to correct common misconceptions surrounding pain.

Barriers to self-management were also identified, including motivation, psychosocial aspects (such as depression) and lack of practitioner knowledge. It remains unclear whether the resource should aim to address some of these barriers.

Presentation: Functionality, or fulfilling the purpose for which it was designed, was identified as the most important aspect of designing a web-based resource. Presentation features were discussed, such as a strong preference for video-over text-based presentation formats. Lastly, emerging technological trends that could impact on the design and use of a web-based resource were identified. For example, the increasing use of 'smart phones' will potentially impact on the content design and presentation.

Conclusion and directions for future research:
A wide array of content would need to be included in a web-accessible educational resource for individuals with CLBP. Further investigation is needed to find out whether some of the identified barriers to self-management could be addressed by a web-based educational resource. More information is needed regarding the impact of technological trends, the depth of information individuals desire, how to address barriers to treatment and the best formats to present different types of content. Further investigation is also needed to establish when, why and how individuals choose to access the internet for health information.

Keywords: Low back pain; Chronic; Web-based; Education; Internet; Resource.

DECLARATION

Name of candidate: Sarah Dryburgh

This Thesis/Dissertation/Research Project entitled 'Early development of a web-based resource for individuals with non-specific chronic low back pain: An action research-inspired approach.' is submitted in partial fulfillment for the requirements for the Unitec degree of: Master of Osteopathy

Candidate's declaration

I confirm that:

- This Thesis/Dissertation/Research Project represents my own work;

- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

    Research Ethics Committee Approval Number: 2009-1019

Candidate Signature: …………………………………………….Date: …………………

Student number: 1271338

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ACC	Accident Compensation Corporation
AR	Action research
BPS	Biopsychosocial
CLBP	Chronic low back pain
LBP	Low back pain
UK	United Kingdom
UREC	Unitec Research Ethics Committee
WACG	Web Accessibility Content Guidelines

SYMBOLS USED WITHIN THIS THESIS

…	Omitted text
[text]	Text has been inserted into excerpt for clarification purposes

JUSTIFICATION OF TERMS USED WITHIN THIS THESIS

'Individuals with LBP'

The term 'individuals' was chosen over the term 'patients' for a number of reasons including:

1. People do not present to a healthcare practitioner every time they experience an exacerbation of their LBP (Pransky, Buchbinder, & Hayden, 2010). Therefore not every potential user of the resource will be a 'patient'. This fact influenced the decision to use the term 'individual with CLBP throughout this thesis.

2. People living with chronic conditions make the decisions regarding their day-to-care (Bodenheimer, Lorig, Holman, & Grumbach, 2002). Therefore, it was felt that the term 'patient' was not fully descriptive of the collaborative care relationship that has been shown to be important in the appropriate management of chronic conditions.

HOW TO READ THIS THESIS

This research project constitutes the initial exploration into the development of a web accessible resource for CLBP using an action research-inspired approach. The thesis has been divided into nine chapter:

Chapter 1: Introduction

Chapter 2: Literature Review

Chapter 3: Methodology

Chapter 4: Method

Chapter 5: Findings and Discussion

Chapter 6: Limitations and Quality Issues

Chapter 7: Conclusions

Chapter 8: Directions for future research

Chapter 9: References

Appendices

CHAPTER ONE

Introduction

Low back pain (LBP) is a common and costly condition that occurs throughout the Western world (Goubert, Crombez, & De Bourdeaudhuij, 2004). In New Zealand, the number and cost of back-pain claims reflects this—in 2007–2008, 14,369 new claims cost $57 million and 9,655 ongoing claims cost $250 million (ACC, 2008a). Of particular concern are the 'ongoing claims', which reflect the proportion of individuals who are affected by chronic LBP (CLBP) (Moseley, 2003a). These individuals often experience frustration, as no underlying pathology[1] can be found to explain their condition (O'Sullivan, 2005). In addition to its associated costs, CLBP is renowned for being difficult to treat. In order to address the treatment difficulties and attempt to reduce the economic impact of this condition, new approaches to treatment need to be explored to more effectively allocate resources (Vlaeyen, Crombez, & Goubert, 2007).

Individuals with chronic conditions, such as CLBP, make the day-to-day decisions about how to manage their conditions. In other words, they 'self-manage' their conditions (Bodenheimer, Lorig, Holman, & Grumbach., 2002). Appropriate management has the potential to reduce the number of people with disabling long-term back pain, and so reduce the personal, social and economic impact of LBP (Airaksinen et al., 2005). The latest guidelines advocate that a key component of LBP management involves including an education intervention as a component of care (Airaksinen, et al., 2005; Savigny et al., 2009). Education can address misconceptions about LBP as a condition and about the meaning of pain. These misconceptions have been shown to be widespread among individuals with CLBP and relate strongly to the development of long-term disability (Briggs et al., 2010; Goubert, et al., 2004; Moseley, 2004; Urquhart et al., 2008).

There are a variety of obstacles associated with including education as a component of private practice. One problem involves the need for practitioners to be appropriately trained to provide education. Other factors include the additional time treatment sessions would require to provide education. Cost is another potential limitation, both in terms of the additional consultation time required to provide the education and the cost of practitioner up-skilling. One approach to overcoming these obstacles is to provide the educational component through a web-based educational resource that an individual can access at their own convenience, rather than during the time-limited consultation (Zufferey & Schulz, 2009).

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[1] The manifestations of a disease (McLeod & Hanks, 1985).

Research has shown that web-based education is effective at adding an educational component to treatment at no extra cost (Wofford, Smith, & Miller, 2005). The educational component of such web-based educational resources provides individuals with an opportunity not only to better understand their condition, but also to increase their ability to actively participate in decisions that concern their treatment (Wells, Hepworth, Murphy, Wujcik, & Johnson, 2003).

Aims

This research study aims to:

1. Explore what material should form the content of a web-based educational resource for individuals affected by non-specific CLBP.

2. Conduct an initial investigation into the presentation considerations pertinent to the development of a web-based educational resource.

The resource will be designed as a supplement, rather than an alternative, to 'usual treatment'.

PAYING FOR LOW BACK PAIN: THIRD PARTY PAYMENT IN NEW ZEALAND

The cost of low back pain

The costs associated with LBP are substantial (Burton et al., 2004; McBride, Begg, Herbison, & Buckingham, 2004; Walker, Muller, & Grant, 2003). Chronic LBP is associated with considerable socio-economic costs (both monetary and opportunity) associated with long-term disability, absenteeism, income compensation and healthcare (Ekman, Johnhagen, Hunsche, & Jonsson, 2005). For example, between 2007–2008, 9,655 ongoing claims cost NZ$250 million (ACC, 2008a) and accounted for over 80% of the money spent on compensation for back pain. These figures only reflect the direct costs of back-pain claims, such as charges for diagnosis, treatment and rehabilitation, including hospital, medical, ancillary and complementary health care (Walker, et al., 2003). Indirect costs are those costs not directly related to treatment and include loss of earnings and productivity, including the imputed value of unperformed tasks such as housekeeping (Walker, et al., 2003). The indirect costs have been estimated to be significantly higher than direct costs. Although there is an absence of New Zealand data, Australian data estimated the indirect costs at AU$8.15 billion. This figure is approximately eight times higher than the estimated direct costs of AU$1.02 billion (Walker, et al., 2003). Although these costs are only estimates, they are useful in that they provide an indication of the size of the economic impact of LBP in an industrialised population that is similar to New Zealand.

Many of the direct costs and some of the indirect costs are met by public or private health insurance schemes. In New Zealand, the Accident Compensation Corporation (ACC) is the main insurance body responsible for meeting LBP healthcare costs.

The Accident Compensation Corporation

The ACC is a national insurance scheme, which arose from a 1967 Royal Commission report known as the 'Woodhouse Report' (ACC, 2008b). The scheme first came into operation on 1 April 1974. The scheme was originally governed by the Accident Compensation Act 1972, since up-dated to the

Accident Compensation Act 2001. The role of ACC is to "provide comprehensive, no-fault[2] personal injury cover for all New Zealand residents and visitors to New Zealand" (ACC, 2008c). This cover includes ACC taking a role in the prevention, treatment, rehabilitation and compensation for all injuries to New Zealanders and tourists visiting New Zealand (ACC, 2008c).

The ACC is funded through several mechanisms. As well as Government funding, levies are collected from individuals' earnings, businesses' payrolls, petrol sales and vehicle licensing fees (ACC, 2010c). As of 1999, ACC became 'fully funded'. This means that the organisation has to collect enough money during each levy year to cover the full lifetime costs of every claim that occurs in a given year (ACC, 2010c).

Like other insurance agencies around the world, ACC must control their costs. Due to recent government pressure, there is currently particular emphasis on ACC's legal obligation to ensure that it is fully funded, which has resulted in stricter control over the claims approval process (ACC, 2010d). In the year 2010, the ACC deficit resulted in a refocusing of ACC's approach to their role. There is currently an emphasis on cost-efficiency and operating as a "prudent commercial insurer" (ACC, 2010d). The focus on stricter fiscal controls has resulted in increases of ACC levies (ACC, 2010a), and tightening of access to treatment across the board (ACC, 2010b). The emphasis on cost control suggests that ACC has a vested interest in reducing the cost of LBP on society.

Education is suggested as a component of treatment in the ACC treatment protocols for professional groups that treat LBP (ACC & New Zealand Chiropractors' Association, 2003; ACC & New Zealand Society of Physiotherapists, 2000). Unfortunately, there is currently little guidance over what content should be covered. In the available treatment protocols, education on the psychosocial issues surrounding pain is advised, although the issues themselves are not specified (ACC & New Zealand Chiropractors' Association, 2003; ACC & New Zealand Society of Physiotherapists, 2000). In addition, there is no reference to the inclusion of education that may assist individuals in correcting misconceptions associated with pain. It is currently unclear whether pain education is not included because healthcare professionals incorrectly assume that patients will not understand the

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[2] Individuals are eligible for treatment, regardless of the way the injury occurred. In addition, individuals do not have the right to sue the party at fault, except for exemplary damages (ACC, 2008c).

information (Moseley, 2003c) or because the provision of neurophysiological[3] information to patients is a relatively new approach. The treatment protocols also do not mention how an educational component should be incorporated into a consultation. The lack of practical information about the implementation of educational strategies means that education can be easily over-looked (Moseley, 2003a).

The Corporation currently offers various specialised pain management programmes that address chronic pain, although none of these focus specifically on LBP (ACC, 2009). These programmes are allocated to practitioners who complete specific educational modules and tender for contracts to provide these programmes. The limitations associated with many of these programmes include the expense to ACC and time commitment required by the individual participants. The specialist practitioner training required and the extra paperwork needed to allow individuals to participate, are also potential limitations.

A web-based educational resource has the potential to enable more practitioners to offer a treatment that is aligned with current best evidence and treatment guidelines (Airaksinen, et al., 2005; Burton, et al., 2004; Savigny, et al., 2009). The accident compensation corporation could benefit due to minimisation of the costs and paperwork associated with providing education. Practitioners could benefit as the resource could potentially be offered without the need for additional education. In addition, such a resource has the potential to increase the number of individuals who have access to an evidence-informed educational resource. Such a resource would not be designed as an alternative to intensive pain management programmes. Instead it would allow more individuals to receive education earlier in their treatment, which could potentially reduce the need for more expensive and intensive pain management programmes (Moseley, 2002).

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[3] The processes involved in the function of the nervous system (McLeod & Hanks, 1985).

THE BIG PICTURE: WHERE THIS STUDY FITS

This research project forms the introduction to a much larger project. The focus of this project was to develop a baseline from which the content and presentation of a web accessible educational resource for CLBP could evolve. Figure 1 provides a visual overview of how this research project, represented as 'Phase 1', fits into the overall resource development process.
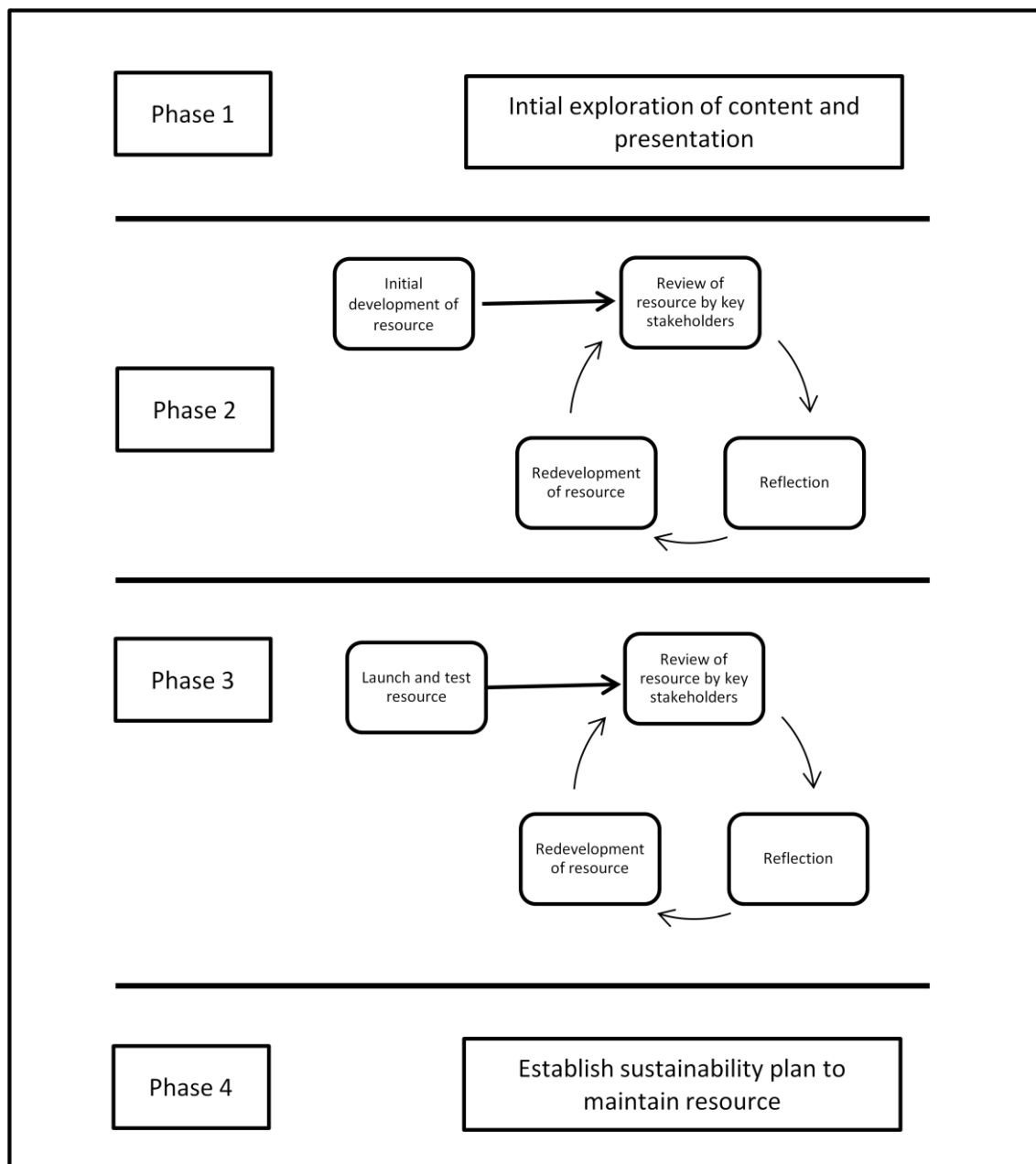
Figure 1: 'The big picture': How this research project (Phase 1) is involved in the development of an educational resource.

CHAPTER

TWO

Literature Review

Introduction

Low back pain (LBP) is an extremely common condition. It is also notoriously challenging to treat, especially when it becomes chronic. While there is currently no definitive treatment for chronic LBP (CLBP), promise has been found in including an educational component alongside manual therapy or exercise programmes. Although education as a form of treatment has been shown to be useful for individuals with CLBP, there are a number of difficulties associated with the provision of appropriate, relevant education.

This review explores the epidemiology of LBP, and some of the common terms used to define it. The healthcare models through which this condition is understood are briefly examined. The use of education as a component of treatment is investigated and the costs associated with CLBP are identified. The chapter concludes with a discussion on the internet as a medium for the provision of education on CLBP.

What is low back pain?

Low back pain is anatomically defined as the experience of pain and/or discomfort that occurs below the costal margin and above the inferior gluteal folds, with or without leg pain (Burton, et al., 2004) (see Figure 2). Low back pain is a common disorder, with the lifetime prevalence reported at over 70% in industrialised countries (Airaksinen, et al., 2005; Burton, et al., 2004; O'Sullivan, 2005). The incidence peaks between the ages of 35 and 55 (Andersson, 1999). Chronic LBP is the most common cause of work-related disability in people under 45 years of age, as well as the most expensive cause of work-related disability, in terms of workers' compensation and medical expenses (Deyo & Weinstein, 2001).
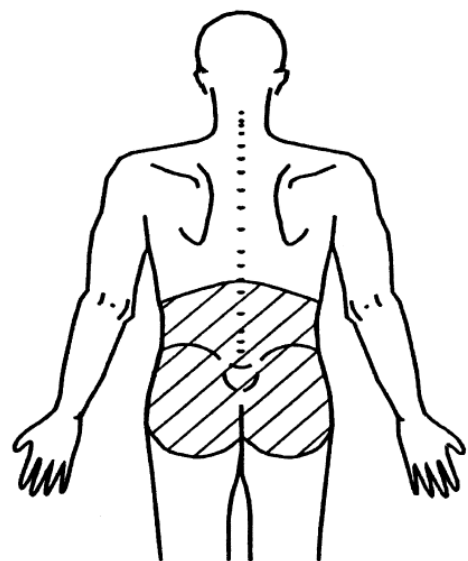
Figure 2: Visual depiction of the anatomical region indicated by the term 'low back pain'. Reprinted from the Journal of Manipulative and Physiological Therapeutics, 27 (4), Walker, B. F., Muller, R., & Grant, W. D., pages 238-244., Copyright (2004) with permission from Elsevier.

The risk factors for LBP are currently only partially understood and inconsistently documented (Dunn, 2010; Hestbaek, Leboeuf-Yde, & Manniche, 2003). Possibly the most important risk factor for a new episode of LBP is a previous history of LBP (Andersson, 1999). This is particularly true during the twelve months following an episode of LBP, where the risk of recurrence is doubled (Hestbaek, et al., 2003). Other common risk factors include heavy physical work, frequent bending, twisting, lifting, pulling and pushing, repetitive work and sustained low load postures (such as sitting) (Burton, et al., 2004; O'Sullivan, 2005).

Additional risk factors have emerged from research into the neurological, psychological and social factors that affect the pain experience. The research is currently inconclusive regarding the actual impact of psychological and social factors; however a number of factors are thought to have at least a small effect (Burton, 2005). For example, psychological factors such as negative thinking, catastrophising and abnormal anxiety regarding pain have been shown to be associated with high levels of pain, disability and muscle guarding (O'Sullivan, 2005). Social factors that may negatively impact on pain perception include work or family tension and job dissatisfaction (Argueta-Bernal, 2004).

Low back pain is a widely used, very general term that refers to a symptom rather than a diagnosis. The distinction between a diagnosis and a symptomatic descriptor is important in the case of LBP, as 80-90% of individuals who experience LBP will not receive a definitive diagnosis due to the challenges associated with the diagnostic process in LBP (Deyo & Weinstein, 2001). Experimental studies show that certain structures in the back are sources of nociception[4], such as ligaments, discs and paravertebral muscles. While these structures may contribute to the experience of LBP (Savigny, et al., 2009), the association between symptoms and diagnostic imaging methods, such as x-rays and MRIs is weak (Argueta-Bernal, 2004). This has lead to the use of a wide variety of non-specific diagnostic terms by healthcare practitioners, such as 'strain', 'sprain', or 'degenerative processes'. Terms such as 'strain' and 'sprain' have never been anatomically or histologically characterized, therefore determining precisely which structures are the cause of nociceptive signals is not currently possible (Deyo & Weinstein, 2001). Those individuals labelled with these terms are described as having 'non-specific LBP' (Cedraschi et al., 1999). The remaining 10-20% of individuals, in whom an

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[4] The reception of noxious stimuli by sensory nerve fibres. Nociception does not constitute pain, although it may lead to the perception of pain (Butler & Moseley, 2003).

underlying pathological cause can be identified (such as a tumour, fracture or nerve root compression) are described as having 'specific LBP' (Cedraschi, et al., 1999).

Low back pain is often clinically classified based on the duration of symptoms. The most commonly used timescale divides LBP into three categories (Burton, et al., 2004):

- Acute LBP   Pain persists for less than 6 weeks
- Sub-acute LBP   Pain persists for 6-12 weeks
- Chronic LBP   Pain persists for longer than 12 weeks

Traditionally, LBP has been considered as a self-limiting condition with most individuals recovering from an episode within six weeks of the onset of symptoms (Hestbaek, et al., 2003). While this is true for most individuals, a small minority will not recover, instead developing CLBP. The estimates for the size of this group vary considerably with estimates ranging between 2-7% (Ekman, et al., 2005) and 23% (Airaksinen, et al., 2005) of those who present with acute LBP. As more is learnt about the natural history of LBP, the use of these statistics are being challenged. While it is clinically useful to classify LBP into acute or chronic categories based on a timeline, this does not give a particularly accurate reflection of LBP within the population (Burton, 2005; Cedraschi, et al., 1999; Hestbaek, et al., 2003). A time-based classification system relies on the assumption that LBP has a linear course. Although the life course of LBP has not yet been definitively studied (Dunn, 2010), longer term studies show that LBP is characterised by "variability and change" (Cedraschi, et al., 1999, p. 358) rather than complete recovery. In fact, presenting to a health care practitioner for a truly initial episode of LBP is rare as many individuals experience LBP during their childhood or teenage years (Pransky, Buchbinder, & Hayden., 2010). Low back pain is more likely to occur as a pattern of symptomatic periods interspersed with pain free or low pain periods (Burton, 2005; Hestbaek, et al., 2003), although in some individuals the symptoms (and associated disability) become persistent. Even amongst individuals with long-standing persistent pain, the symptoms may fluctuate from day to day (Cedraschi, et al., 1999). In addition, contrary to popular belief, while individuals commonly stop presenting to healthcare practitioners for treatment after six weeks, this does not necessary indicate complete recovery, although research studies often correlate concluding treatment with recovery (Hestbaek, et al., 2003). The acknowledgement of the variable nature of

LBP has lead to the suggestion that 'recurrent[5]' LBP should be included within the CLBP group, especially when considering action to minimise the consequences of LBP, such as disability, recurrence and work loss associated with LBP (Burton, 2005; Liddle, Gracey, & Baxter, 2007).

Treating low back pain

Chronic LBP is a multifactorial phenomenon. While many therapeutic approaches exist, studies generally find that treatments only produce a relatively 'small effect' if they produce any significant effect at all (Artus, van der Windt, Jordan, & Hay, 2010). The small effect size is likely due to a number of factors, including the current poor understanding of the aetiology and natural history of LBP (Dunn, 2010) and the heterogeneity of the LBP population. In the case of CLBP, one problem also lies in the fact that treating CLBP is not a simple case of healing an injured tissue. Due to the highly variable nature of LBP, neither the aetiology nor responsiveness to interventions is consistent from individual to individual (Delitto, 2005). It has taken a long time for the highly individual nature of CLBP to be acknowledged; however, the current guidelines and literature now consistently reflect this fact (Airaksinen, et al., 2005; Savigny, et al., 2009; Weiner, 2008). The delay in acknowledging the individual aspects of LBP was in part due to the prevalence of the biomedical model of healthcare (Grimmer-Somers, Kumar, Milanese, Moreton, & Young, 2009; Main, Richards, & Fortune, 2000).

Models of healthcare

Humans use models to simplify the world around them in order to explain or understand it (Engel, 1977). No model can ever hope to fully capture all the intricacies and subtleties of the world we live in, although they are useful ways of promoting understanding. The predominant model in healthcare at this time is the 'biomedical model' (Grimmer-Somers, et al., 2009). This model is useful in many instances, but has not been particularly successful in treating CLBP for a number of reasons, resulting in the adoption of an alternate model – the 'biopsychosocial (BPS) model'. The following section will discuss both models briefly, followed by an explanation of how education fits into the current model of healthcare and why education is important in managing CLBP.

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[5] New episode of LBP after a symptom free period, as opposed to an exacerbation of persistent LBP (Burton, et al., 2004).

The biomedical model

The biomedical model (also known simply as the 'medical model') is the predominant model through which the idea of illness is understood at this point in time (Grimmer-Somers, et al., 2009). This model is based on the premise that there is a direct, causal relationship between an illness and its signs and symptoms. In other words, the model assumes the stance that the more severe the signs and symptoms, the more severe the pathology. While this viewpoint is relevant in understanding acute forms of illness or acute exacerbations of chronic conditions, it is less useful when considering complex conditions such as CLBP, where most pain is considered idiopathic, or 'non-specific'. In conditions such as CLBP the physical findings seldom correlate with an individual's experience of pain and disability (Main, et al., 2000; Moseley, 2007). Over the past two decades, it has been acknowledged that a complex, multidimensional condition such as CLBP does not lend itself to the apparent simplicity of the biomedical model (Airaksinen, et al., 2005; Burton, et al., 2004; Savigny, et al., 2009). The pathophysiology of CLBP are very difficult to study or treat in isolation as many of the pathoanatomically 'abnormal' findings are also commonly observed in the pain free population (Boos et al., 2000). In addition, these pathoanatomical findings correlate poorly with levels of pain and disability (Nachemson, 1999). Instead, the biological, psychological and social factors unique to the individual need to be considered together. In addition, by not considering the social and psychological factors associated with a condition, the biomedical model does not seek to understand why a particular individual would choose to present for treatment at a particular moment in time. When and why an individual chooses to seek treatment is an important factor in CLBP where longitudinal studies have shown that recurrent exacerbations are common and that these episodes are often managed without consultation (Pransky, et al., 2010). Ascertaining why an individual should choose to present for treatment is essential to understand their unique circumstances, allowing treatment to be tailored accordingly (Pransky, et al., 2010). The need to recognise and treat each individual with CLBP as a unique being with a singular social, psychological and biological make-up has lead to the widespread adoption of the BPS model as the primary model upon which treatment for CLBP is based (Weiner, 2008). Currently many practitioners and insurance companies follow a biomedical model of care (Grimmer-Somers, et al., 2009; Main, et al., 2000; Moseley, 2003c; O'Sullivan, 2005). The reasons include a lack of understanding of the mechanisms underlying chronic pain (Moseley, 2003c) as well as difficulties in changing large, established claim systems (Grimmer-Somers, et al., 2009). However, the problems associated with a biomedical model of care have been identified and individual practitioners and insurance companies are slowly shifting their approach (Grimmer-Somers, et al., 2009; Moseley, 2003c).

The biopsychosocial model

The BPS model first appeared in the literature in the 1970s. Its formalisation as a model is generally attributed to Engel (Weiner, 2008). The BPS model is an alternate model of healthcare that grew out of a dissatisfaction with the perceived shortcomings within the biomedical model, particularly its limitations in acknowledging the unique psychological, social and behavioural aspects of illness (Borrell-Carrio, Suchman, & Epstein, 2004). The BPS model attempts to view the individual presenting with a healthcare complaint as an individual who is formed from a unique biological, social and psychological situation (Borrell-Carrio, et al., 2004; Engel, 1977). This model encourages healthcare practitioners to work in partnership with those they are treating to achieve healthcare outcomes. The result of working in partnership is that the power and responsibility for treatment do not rest solely in the hands of the healthcare practitioner; instead the BPS model encourages shared ownership of a problem, where the individual seeking care is imbued with the power to make decisions regarding their health (Grimmer-Somers, et al., 2009). The medical diagnosis does not hold centre-stage as the most important aspect of care, and there is a drive to ensure that a practitioner is providing assistance that is relevant for the individual (Pransky, et al., 2010).

The BPS model, like any healthcare model, does not exist without its critics. While it is not within the bounds of this literature review to discuss all the potential problems with this model, it is important to note a recurrent warning within the CLBP literature. Anecdotal evidence would suggest that there is a growing trend amongst some practitioners toward classifying individuals with CLBP as having mostly psychosocially driven pain (O'Sullivan, 2005). However it appears that only a small sub-group exists where psychosocial factors become the dominant or primary pathological basis for LBP (O'Sullivan, 2005). Weiner (2008) offers a word of caution as he praises the advances the BPS model has allowed in treating CLBP. He highlights the fact that although the current pathoanatomic understanding of CLBP is limited, this may not always be the case. The BPS model is useful in creating a fuller understanding of CLBP, but the biological mechanisms should not be ignored in favour of concentrating on psychological or social factors alone.

The need for caution in using the BPS model has not diminished its usefulness. Its implementation is widespread and forms the basis of the World Health Organisation's International Classification of Functioning, Disability, and Health (Weiner, 2008), as well as the latest guidelines for the treatment and prevention of CLBP (Airaksinen, et al., 2005; Burton, et al., 2004; Savigny, et al., 2009). In contrast to acute LBP, few management guidelines for chronic LBP are available (Airaksinen, et al., 2005). Recently this lack has been addressed with the release of two guidelines based on extensive

research and discussion groups: The United Kingdom's (UK) National Collaborating Centre for Primary Care's 'Low back pain: Early management of persistent non-specific low back pain' (Savigny, et al., 2009) and the European Union's Cooperation in Science and Technology (COST) B13 Working Group on Guidelines for Chronic Low Back Pain 'European guidelines for the management of chronic non-specific low back pain' (Airaksinen, et al., 2005). Both the European and UK guidelines are based on the BPS model and advocate that the current best evidence suggests that treatment for CLBP should include a BPS-derived educational component. This educational component should provide individuals with advice and information to promote self-management of CLBP (Airaksinen, et al., 2005; Savigny, et al., 2009). The guidelines differ in their recommendations for the type of treatment that should accompany this education, with the European guidelines promoting a combination of exercise and education for LBP and the UK guidelines a combination of education with an exercise programme or course of manual therapy or course of acupuncture. Both guidelines emphatically conclude that only BPS-based education is useful, while education based in the biomedical model (including pathological and anatomical information) was not to be recommended (Airaksinen, et al., 2005; Burton, 2005; Savigny, et al., 2009). Offering formal education programmes as stand-alone alternatives to treatment was also not recommended as they have been shown to be ineffective (Savigny, et al., 2009; Waddell, 2004).

Low back pain and education

Low back pain 'myths'

The beliefs individuals hold can be a key factor in how they manage and interpret pain (Goubert, et al., 2004). In fact, the fear of pain has been found to be more disabling than pain itself (Crombez, Vlaeyen, Heuts, & Lysens, 1999). Misconceptions about the meaning of pain have been found to be associated with a worse experience of LBP and associated disability (Briggs, et al., 2010; Goubert, et al., 2004; Urquhart, et al., 2008). These misconceptions relate to beliefs such as that the amount of pain is intrinsically linked to the severity of an injury. Other common misconceptions include the unrealistically high expectations placed on health professionals and diagnostics tests, including the belief that x-rays and modern high technology imaging techniques can always identify the cause of LBP (Briggs, et al., 2010; Goubert, et al., 2004; Urquhart, et al., 2008). In a study on the prevalence of misconceptions in a European community by Goubert et al. (2004) it was found that many of the

participants[6] viewed medical diagnosis, medical treatment and activity avoidance as the proper approach to LBP management. These beliefs are unhelpful as the majority of the time it is not possible to identify the underlying cause of LBP. There are currently no available studies on whether individuals in New Zealand hold similar misconceptions. However, an Australian study by Briggs et al, (2010) found similar types of misconceptions to those found in the European study. As Australia is a close cultural neighbour to New Zealand, it is possible that New Zealanders may hold similar misconceptions about LBP. The exact relationship between LBP beliefs and the experience of LBP still requires further study; however, it is known that fears and unhelpful beliefs about LBP can have a significant negative impact on the experience of people with LBP (Pellisé & Sell, 2009). Research has shown that the information and advice given to individuals can be a potent element of treatment (Burton, Waddell, Tillotson, & Summerton, 1999). Better educated patients tend to have better treatment outcomes due to the associated increase in realistic behavioural modifications and expectations (Ullrich & Vaccaro, 2002).

Patient education and choice have not always been deemed to be important. The process of decision-making was historically seen as the sole responsibility of the healthcare professional. With the acknowledgement of some of the problems with the biomedical model of healthcare and the move to a more patient-centered model of medicine, this is no longer the case (Molenaar et al., 2000; Ullrich & Vaccaro, 2002). Individuals have also become more conscious consumers of healthcare. Individuals expect to be given more information, and many express a desire to participate in medical decision-making (Molenaar, et al., 2000; Pellisé & Sell, 2009). This trend is apparent in the literature surrounding LBP, where self-management of the condition is encouraged, if not essential for positive outcomes.

There is currently no definitive treatment for LBP. As a condition, it is a highly individual experience, and it is therefore unlikely that a 'magic bullet' treatment will ever be found (Delitto, 2005). Due to the singular nature of LBP, the lack of successful treatments and the current poor understanding of the underlying mechanisms involved in producing this condition, it is essential that affected individuals become actively involved in their healthcare (Zufferey & Schulz, 2009). A key focus for healthcare practitioners working with individuals with CLBP is to assist them in learning to self-manage their condition. The current best evidence suggests that it is of value to acknowledge that

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[6] Participants were representatives of the general population.

LBP is a common experience rather than a serious disease that requires careful monitoring (Crombez, et al., 1999; Savigny, et al., 2009). It is also important that practitioners and individuals with CLBP are aware that the focus of CLBP management should be shifted away from finding a complete resolution for the pain. Instead, the focus should be on providing advice and information that can be tailored to an individual's unique situation, enabling them to deal with their health problems more effectively, while assisting them to live as normally as possible despite their condition (Savigny, et al., 2009; Zufferey & Schulz, 2009).

Reconceptualising low back pain

In the context of clinical interventions, educational programmes are generally designed with the intent to give individuals the strategies and tools necessary to make daily decisions that allow them to cope with their condition (Pellisé & Sell, 2009). Managing the experience of pain itself is one of the biggest factors in coping with CLBP on a daily basis. However there are many misconceptions surrounding pain and what it means to experience pain that can adversely affect an individual's ability to cope with CLBP. To assist individuals in coping with CLBP, it may be necessary to re-educate them to align their understanding of pain with a modern scientific explanation (Moseley, 2007).

One of the main LBP misconceptions is that pain is closely linked to the severity of the injury. This is seldom true in LBP, particularly in CLBP. The International Association for the Study of Pain defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (Merskey & Bogduk, 1994, p. 210). The key to this definition is the concept of 'potential tissue damage,' as it identifies that pain is not necessarily related to tissue damage. Non-specific chronic pain is often defined as pain that persists beyond the expected time course of tissue healing and generally occurs in the absence of identifiable tissue damage (Audette & Bailey, 2008).

The concept that pain may occur in the 'absence of identifiable tissue damage' is highly relevant to individuals experiencing non-specific chronic pain, as it acknowledges that nociception[7] is not necessary for the perception of pain (Butler, 2000). Unfortunately the concept that pain can occur without a pathological basis is not widely acknowledged, with many individuals still using the

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[7] Nociception refers to the reception of noxious stimuli by sensory nerve fibres. Nociception does not constitute pain, although it may lead to a perception of pain (Butler & Moseley, 2003).

structural-pathology[8] model to attribute pain to an injury or other pathological process (Moseley, 2003c).

Moseley (2007, p. 169) suggests that the problem with the structural-pathology model lies in the fact that it is based on the out-dated concept that pain "provides an accurate indication of the state of the tissues." Therefore it has been supposed that chronic non-specific pain is caused by either unresolved tissue damage or a psychological disorder. With a modern understanding of pain, this model has become outmoded, and does little to provide a satisfactory explanation as to why people experience non-specific chronic pain (Moseley, 2003b).

Another problem with the structural-pathology pain model lies in its failure to take into account the 'plastic nature'[9] of the nervous system. Research now shows that pain does not correlate with the actual state of the tissues and that pain is, in fact, modulated by factors other than pathological processes (Moseley, 2007). The result of the plasticity within the nervous system is that an individual can experience debilitating pain, even in the absence of an injury or other pathological process (Moseley, 2003b; Wright, 2002).

Reconceptualising how individuals view pain is a reasonably new and novel approach to educating individuals with CLBP. Neurophysiological education has been shown to affect the beliefs individuals hold regarding pain. An appreciation of the neurophysiological mechanisms of pain has been shown to change the way individuals think about pain. The educational advantage of understanding pain is shown through a reduction of the threat value of pain and improvement in the management of it (Moseley, 2003b, 2007). Reducing the threat value of pain allows individuals to shift their focus away from pain and movement avoidance in favour of empowering them to share in positive decisions about their rehabilitation (Hochlehnert et al., 2006; Moseley, 2003a).

Many individuals with back pain express a desire to learn about their condition, what to expect, and what they can do about it (Coulter, Entwistle, & Gilbert, 1999; Molenaar, et al., 2000). Although this information is desired, many individuals report difficulty in sourcing relevant information. There are many possible reasons to explain the difficulties in sourcing information, although there is evidence

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[8] A model of pain that relies on the assumption that the pain experienced gives an accurate indication of the state of the affected tissues (Moseley, 2007).

[9] Plasticity refers to the ability of the nervous system to change its capabilities through experience (Moseley, 2003b).

that it is in part because health professionals underestimate patients' desire for and ability to understand information about chronic pain (Coulter, et al., 1999; Moseley, 2003c). In addition, the time spent in consultation with health professionals is typically short and there is often not enough time to fully explain conditions or answer questions an individual may have (Coulter, et al., 1999). Another major obstacle to the inclusion of sufficient education within the consultation is the cost, both in terms of the time and economic value of such programmes (Coulter, et al., 1999; Guzman et al., 2001).

Traditional patient education programmes are challenged by potential barriers of storage, access problems and the need to keep content materials up to date (Pellisé & Sell, 2009).The internet provides a potentially useful alternative to physical resources (such as printed media) by providing low-cost educational information aimed at assisting individuals in learning about their CLBP, as well as assisting them in questioning their attitudes and beliefs about their back pain, and what management system works best for them (Foster & Butler, 2003; Lewis, 1999; Zufferey & Schulz, 2010).

The internet as a medium for health education

The internet is increasingly being favoured as a medium for the delivery of health-related education topics due to its versatility and the low costs associated with delivery (Wells, et al., 2003). Although some older studies have shown that health education provided via the internet is ineffectual, these studies have focussed on internet delivery as an alternative to 'usual treatment' (Brox et al., 2008). Positive results have been found in studies that include an internet based educational intervention for LBP as an additional component of 'usual treatment' (Chiauzzi et al., 2010; Schulz, Rubinelli, Mariotti, & Keller, 2009; Zufferey & Schulz, 2009).

Trends show that many individuals are using the internet as a means of further health education (Pellisé & Sell, 2009). A growing body of literature documents the importance of online health communication as a promising tool for enhancing self-management of chronic conditions (Suggs, 2006; Zufferey & Schulz, 2010). Web-based patient education has the potential to blend with other education and advice offered in the healthcare environment (Zufferey & Schulz, 2009). A 2007 (Ayantunde, Welch, & Parsons) survey in Nottingham, England found that 82% of patients surveyed who had internet access and 21% of those with no internet access professed interest in using trustworthy health information on the internet. The survey also found that nearly half of the individuals surveyed had used the internet to access health information and most of these

individuals were interested in using validated health information. The increasing ease of access to the internet means that it is a resource that is becoming more viable as a means of easily transmitting health information. The latest available statistics on household access to the internet in New Zealand dates back to 2009, where it was found that 75% of New Zealand households had access to the Internet at home, compared with 65% in 2006 (Bascand, 2010). Of the total population it was found that 80% of individuals aged 15 years and over had used the Internet in the previous three month period, up from 69% in the same three month period in 2006 (Bascand, 2010). It was predicted that these figures would continue to rise.

Although increasing numbers of individuals are turning to the internet for health education (Ullrich & Vaccaro, 2002), the quality and validity of the available CLBP websites, and quality of information contained within them is often poor (Foster & Butler, 2003; Li, Irvin, Guzmán, & Bombardier, 2001). The low quality is due to a number of factors including that websites are often written from a special interest perspective (for example, to sell a product) (Li, et al., 2001) and they often do not follow current treatment guidelines (Foster & Butler, 2003; Li, et al., 2001). For example, Butler and Foster (2003) found that of the 60 websites they reviewed, 14 recommended bed rest as a treatment for LBP. Bed rest has been conclusively associated with worse outcomes for LBP and is not to be recommended (Airaksinen, et al., 2005). Unlike most written other media, educational material placed on the internet is not subject to peer review (Li, et al., 2001). This means that anyone, regardless of their qualification or motive, can place information on the internet (Foster & Butler, 2003; Gilliam, Speake, Scholefield, & Beckingham, 2003). Another common complaint is that most websites only offer very general information and advice that individuals find difficult to apply to their unique situation (Foster & Butler, 2003; Schulz, Rubinelli, Zufferey, & Hartung, 2010). A solution to the problems associated with the quality and validity of websites is the use of clinician referrals to appropriate websites (Gilliam, et al., 2003; Li, et al., 2001). A clinician referral allows individuals to source reliable and trustworthy information and avoids the confusion created by poor quality websites.

When individuals are able to access sites that contain quality information, the use of the internet as a means of providing education has a number of advantages. It gives individuals the ability to access information at a time and place that suits them, as often as they wish (Lewis, 1999; Pellisé & Sell, 2009). Repeated access is useful as studies have found that, on average, individuals forget about half of what they are told by a healthcare practitioner within five minutes of leaving the consultation room (Treweek, Glenton, Oxman, & Penrose, 2002). In addition, health professionals may forget to pass on relevant information (Pellisé & Sell, 2009). There is, therefore, scope for improvement in

communication between professionals and patients, which is especially true if patients are to become more active participants in their own care.

Ensuring that individuals have access to supplementary information is one way to ensure that what happens during a consultation can be revised (Coulter, et al., 1999). Other advantages include the fact that the costs associated with internet-based education are generally lower and up-dating the information is rapid and cost effective (Treweek, et al., 2002). Internet education has been found to be useful in balancing the power relationship between healthcare practitioners and their patients as it allows individuals to develop more in-depth knowledge of their condition. During the consultation, this increased knowledge enables individuals to ask more focussed questions within the consultation, allowing them to make more informed decisions concerning their treatment (Lewis, 1999; Pellisé & Sell, 2009; Zufferey & Schulz, 2009). Although individuals may benefit from the information they receive, it is imperative to remember that education is most useful when incorporated within treatment, not as a stand-alone approach (Burton, et al., 2004). In addition, it is important that healthcare practitioners work closely with individuals when creating internet based healthcare resources to ensure that the needs and expectations of the individuals correspond with the information provided (Gremeaux & Coudeyre, 2010).

Educational websites for individuals with chronic low back pain

While there are very few examples of successful, well-researched websites for CLBP (Chiauzzi, et al., 2010; Zufferey & Schulz, 2009), an example of a successful website does provide evidence that online resources can be successfully incorporated into treatment. ONESELF is a successful internet based educational resource for CLBP. This resource is a project developed and run by the University of Lugano (Switzerland) as a means of providing a combination of information and support for enhancing the self-management of CLBP. The site is currently available only in Italian. A number of studies (Schulz, et al., 2009; Schulz, et al., 2010; Zufferey & Schulz, 2009; Zufferey & Schulz, 2010) have been conducted on the users of ONESELF and the results have been consistently positive. The findings include that the users of ONESELF felt that they could take all the time they needed to navigate the website, unlike consultations with their healthcare practitioners, which they felt were rushed. The majority of ONESELF users found that the website helped build their frame of reference about the nature and course of their LBP, as well as developing their sense of self management, improving their self confidence and enabling them to maintain a high level of motivation for self-management (Zufferey & Schulz, 2009). However, the authors offer a word of caution as they found that the website was only really helpful for individuals who were already engaged in a process of

self-management or at least who were inclined to do it (Zufferey & Schulz, 2009). For those individuals not engaged in a self-management process, abandoning the idea of a biomedical solution (i.e a diagnosis with a corresponding cure) represents a distinct philosophical shift in the individual's relationship with and management of their CLBP (Suggs, 2006). This shift is a personal decision that can require a considerable period of self-reflection and learning before action is taken. A tool like ONESELF can be useful as it provokes these individuals by showing them that another attitude is possible and may even be advantageous (Zufferey & Schulz, 2009).

Conclusion

Chronic LBP is a multifactorial, highly individual condition. Current understanding of the life history of this condition is lacking, however, the research suggests that many individuals experience it as a recurrent condition. The recurrent nature of LBP has been acknowledged through a broadening of the CLBP label to include both those individuals with persistent pain and those who experience recurrent LBP.

There is currently no definitive treatment for LBP, however the shift from the biomedical approach to the more patient centered BPS model of care has met with some success. Although there is no 'magic bullet' treatment available, the latest guidelines for CLBP recommend that a BPS-based educational component should be included as part of the usual treatment. Education is useful as the highly individual nature of CLBP, and the ineffectiveness of the current available treatments, make self-management imperative. Education is also useful to assist in correcting misconceptions about the meaning and cause of pain in CLBP.

Sufficient education is often difficult to include during the consultation with a healthcare practitioner due to a number of factors such as time constraints. The internet offers a cost-effective means of providing an educational component of care in a cost and time effective manner. While there are many benefits to the provision of education through a web-based medium, care must be taken to ensure that sites are developed according to the current best treatment guidelines.

CHAPTER

THREE

Methodology

Introduction

The Methodology chapter gives an overview of the needs of this project and how they are satisfied by an action research (AR) inspired approach. A brief overview is given of the history of AR and the state of AR in the present day. The qualities inherent to all AR projects will be identified, and an overview of the benefits and limitations involved with using this methodology is included. The chapter concludes with a discussion on how rigour can be achieved and a description of the influences behind the AR methodology that have shaped this project.

The needs of this project

The aim of this project was to create an early draft of a web accessible educational resource for individuals affected by non-specific chronic LBP (CLBP). Creating a resource is a somewhat unusual choice of topic within a Master's research programme. In addition, there is a noticeable absence of studies on how to adequately design online resources for healthcare applications. The methodology and methods used therefore needed to encompass both the emergent nature of a project involving the development of a resource and the academic rigour required for Master's study. Flexibility was needed to allow for exploration of the topic and adaptation of the methodologies to the emergent needs of the project without invalidating the data. The potentially conflicting requirements for a process that was academically rigorous, yet also dynamic and responsive to the emergent needs of developing a resource resulted in the selection of AR as a methodology.

A brief history of action research

Kurt Lewin is generally acknowledged as the originator of AR. Lewin coined the term in 1944 (Dickens & Watkins, 1999; Peter & Robinson, 1984) to describe the research model he had developed in response to the difficulties he perceived while working in industrial relations.

Lewin proposed that science could be used to address social problems. However, rather than studying a single variable within a complex system, Lewin suggested that the entire system should be considered (McNiff, 1988).

The original model conceived by Lewin consisted of a cycle of analysis, planning, acting, observing and reflecting (see Figure 3 on page 25). The cycle was designed to bring ever deepening surveillance of the problem or situation to the researchers and participants, by cycling between these reflection, research and action phases multiple times (Dickens & Watkins, 1999). One of the major features of Lewin's research model was the use of both action and reflection phases. These phases were designed so that actions could be changed and progressively improved as people learned from their own experience (Dickens & Watkins, 1999).
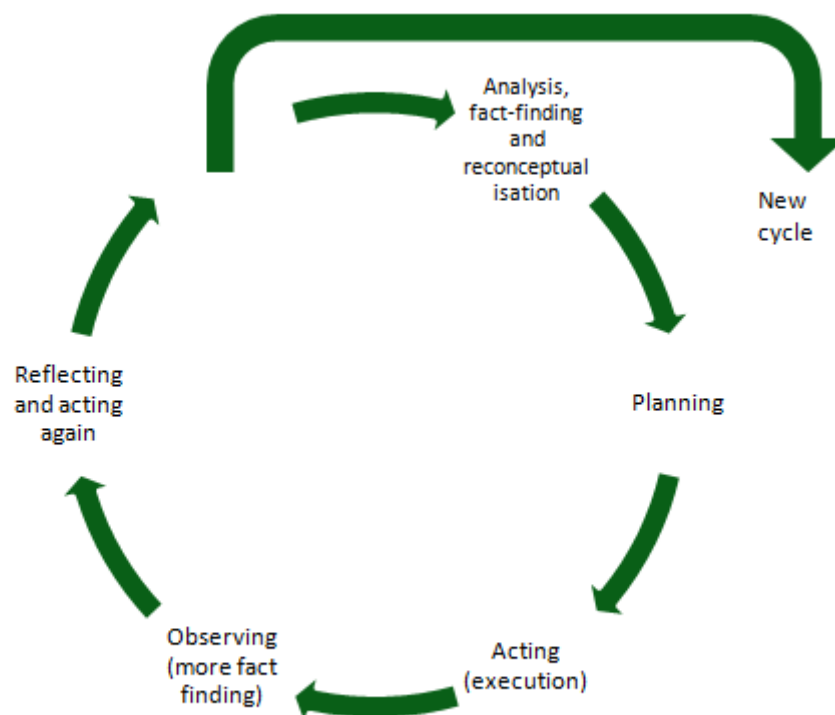
Figure 3: Lewin's Action Research Model (adapted from 'Figure 1: Lewin's action research model' in Dickens and Watkins, 1999).

Action research is a term used to describe an extensive variety of methodologies. Lewin died in 1947, having written very little about his views on AR (Dickens & Watkins, 1999). Peter and Robinson (Peter & Robinson, 1984) propose that because Lewin was unable to fully conceive his theory of AR before his death he left room for elaboration upon and reinterpretation of his definition. This has led to significant evolution and creativity stemming from his original idea. Although each of the variants of AR has its roots in the Lewinian model, there is differing emphasis on different aspects of his process. For example, 'Participatory AR' has embraced the social change theme, while 'Collaborative Inquiry' emphasizes the power of asking questions and of collaboration (Dickens & Watkins, 1999).

Diversity within AR has lead Reason (2006) to argue that the origins of AR are broader than that of a single man, and instead lie in a variety of sources. Philosophically Reason (2006) suggests that the ideological influences behind AR range from liberal humanism, pragmatism, phenomenology and critical theory. Practically, he argues that the different variations under the AR umbrella have been developed through the work of "scholar-practitioners in many professions, notably in organisation development, teaching, health promotion and nursing, and community development both in Western countries and in the majority world" (Reason, 2006, p. 188). Although all forms of AR arguably share a common origin, there is not a unified theory that combined these forms. Instead, what has arisen from Lewin's work are multiple models of research that can be applied to a multitude of situations, ranging from guiding organisational change, planning and policy making, to solving problems, improving systems and developing theoretical knowledge (Dickens & Watkins, 1999). The diversity within the AR field is problematic when attempting to settle of a single definition.

Action research in the present day

In the present day AR is an 'umbrella term' that is used to describe a family of research methodologies that pursue the dual aims of action and research outcomes simultaneously (Dick, Passfield, & Wildman, 2000; Dickens & Watkins, 1999). While there is no definitive approach to AR (Dickens & Watkins, 1999), in a summary of some of the definitions available Costello (2003, p. 3) notes that "action research is referred to variously as a term, process, enquiry, approach, flexible spiral process and as cyclic" in the literature. Other common characteristics of the methodology are that it has a practical, problem solving emphasis and may be undertaken by individuals or teams. It consists of a three-pronged approach, involving research, action and critical reflection and is often used to improve a practice or process. The 'action' in AR describes the intent to understand, evaluate or bring about change in a community, organisation or system, while the 'research' generally denotes the desire to increase understanding on the part of the researcher, the participants or wider community, depending on the scope of the project (Costello, 2003; Dick, 1995). The third important component is 'critical reflection', which involves reviewing actions undertaken and planning further actions (Costello, 2003; Dick, 2005b).

Based on the characteristics mentioned previously, if a single definition could be offered, which can attempt to capture the variations in AR, then the description offered by the Action Learning and Action Research Association is probably the closest. The association defines AR as "a flexible spiral

process which allows action (change, improvement) and research (understanding, knowledge) to be achieved at the same time" (Dick, 2002a).

Attempts have been made to summarise what the subtypes of AR have in common. Dick, Passfield, and Wildman (2000) and Peter and Robinson (1984) found that:

1. All AR tends, to differing degrees, to involve cyclic periods alternating between research and action.
2. All AR has varying participative qualities, involving participants to varying degrees throughout the process.
3. All AR aims to achieve a change as a consequence of the alternating research and action spirals.
4. Dick et al. (2000), also argue that an additional quality of all AR methodologies is the involvement of some aspect of qualitative data collection[10] as well as the inclusion of reflective practices.

It is important to note that both sets of authors commented on the fact that within the various schools of thought, there will always be debate as to how the qualities are defined. Some proponents argue that AR must involve participation where the participants define the problems, cogenerate relevant knowledge and interpret the results (Greenwood & Levin, 2007; Kemmis & McTaggart, 1988) while other proponents emphasise that personal reflection and examination of the researcher's own 'living theory' is a defining feature of AR (Whitehead & McNiff, 2006). Yet others emphasise the emancipatory yearnings of AR and promote the idea that "action researchers aim to act morally and promote social justice through research that is politically informed and personally engaged," (Greenwood & Levin, 2007, p. 10).

A number of authors (Dick, et al., 2000; Dickens & Watkins, 1999; Swepson, 1998) argue that the definitions and degree to which each of the previously described 'qualities' are represented in an individual project is based on choices made by the researcher, and at times the other participants, and is inherent in making appropriate choices that reflect the needs of the individual project.

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[10] Any data collected that is not numerical in nature (Ezzy, 2002).

Costello (2003) and Reason (2006) agree, and postulate that the emphasis in AR is on choice, not prescription, based on a reasoned thought process, as to what best meets the needs of the project.

In summary, due to the existence of multiple forms of AR, the modern day action researcher may choose one or several methodologies to inform their action. Consequently, it may be difficult to identify a 'pure' action researcher, that is, someone who follows only one particular methodology (Dickens & Watkins, 1999).

A discussion of the 'qualities' of action research

Action research usually commences with an observation in the real world that raises questions such as, "what is happening here?" and "how can it be done better?" (Burns, 2000). Action research in one of its many forms is then used to approach the problem. The following section discusses the qualities that are common to all subtypes of AR, as proposed by Dick, Passfield, and Wildman (2000) and Peter & Robinson (1984) in the previous section.

Cyclic periods

The cyclical nature of AR could be said to be its defining feature (Dick, et al., 2000; Zuber-Skerritt, 1991). All AR is based on variations of a spiral of cycles that alternate action and research in some way (Costello, 2003; Dick, et al., 2000). Most cycles involve a reflective cycle, either embedded within each phase, or as a stand-alone phase (Dick, 2000b). There are a variety of models available, which have been developed from Lewin's original model (McNiff, 1988) (see Lewin's model in Figure 3 on page 25). For example, Kemmis and McTaggart have popularised the Deakin Model, seen in Figure 4, which they use in their Participatory AR approach (Kemmis & McTaggart, 1988). This model cycles through the stages "plan, act, observe, reflect".
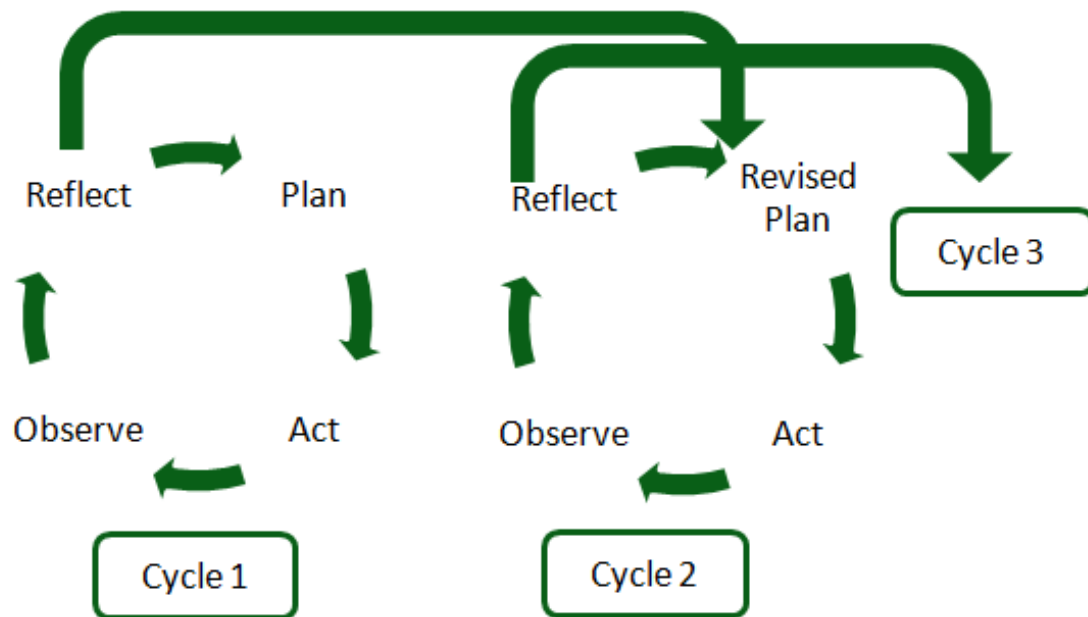
Figure 4: Kemmis and McTaggart's Deakin Model for Participatory Action Research (adapted from 'Figure 1' Riding, Fowell, and Levy, 1995)

Dick prefers to use a simpler model that cycles through three stages; plan, act, review, with critical reflection embedded within the process (Dick, 2002b).
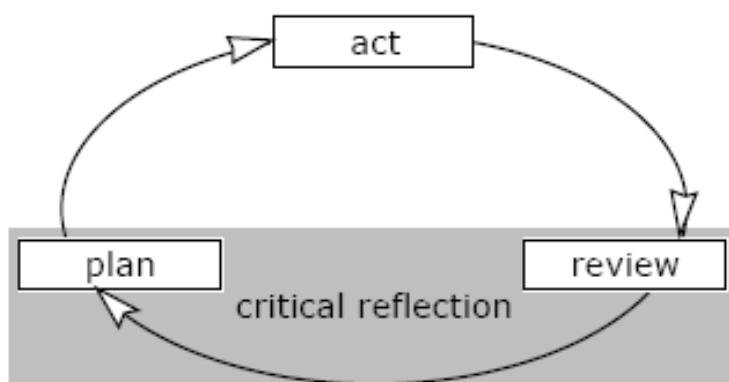
Figure 5: Dick's preferred model of action research (Dick, 2002b). Reproduced from 'Making process accessible: Robust processes for learning, change and action research', Paper 41, Dick, B., Copyright (2002) with permission from Bob Dick.

McNiff (1988) proposes a written model (seen in Figure 6), as she felt that it was less restrictive and prescriptive than models that were represented visually.

The basic steps of an action research process constitute an

- We review our current practice,

- identify an aspect that we want to investigate,

- imagine a way forward,

- try it out, and

- take stock of what happens.

- We modify what we are doing in the light of what we have found, and continue working in this new way (try another option if the new way of working is not right)

- monitor what we do,

- review and evaluate the modified action

- and so on....

Figure 6: McNiff's action research model (McNiff, 2002, p. 11).

Although there are a variety of models to choose from, it is apparent that all the models are variations on the same theme. Each of the models includes the dual requirements for action and research, with a period of critical reflection. Even Checkland's 'Soft Systems' model (see Figure 7), which may at first appear to stray away from a more traditional AR model, has embedded within it the fundamental components of AR. Within the process, there is the need to gather data ('research') and reflect on the data ('critical reflection'), which feeds into devising a new system based on the data and reflection ('action').
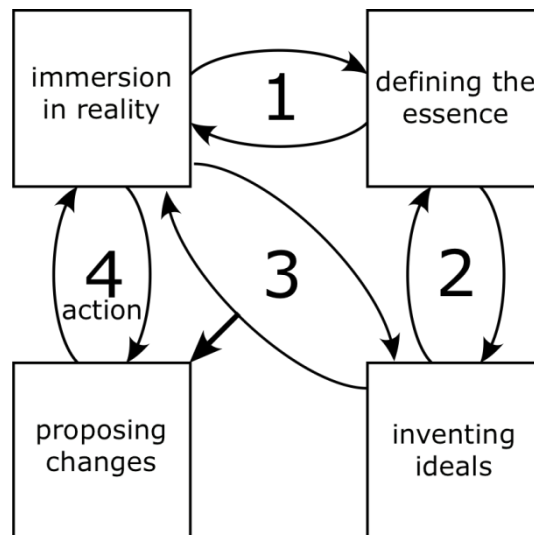
Figure 7: Checkland's Soft System's Methodology (Dick, 1993). Reproduced from Action Research Theses, Thesis Resource Paper, Dick, B., Copyright (1993) with permission from Bob Dick.

Regardless of the AR model chosen, an action researcher may choose to begin at any point within the cycle. For example, the researcher may decide to begin with a plan. The plan usually includes problem analysis, and is the point at which a researcher decides what they will do. The planning stage is often followed by an action stage, in which the plan is implemented. In some instances, an observational or assessment phase may follow the action stage to see what effect the action had. Critical reflection generally follows observation. Following reflection, a new plan is developed that takes into account what was learnt during the previous cycle.

Achieving change through alternating action and research spirals

One of the defining characteristics of AR is that it is practical. This characteristic results in research outcomes that are not only of theoretical importance. The outcomes can also be used to make "practical immediate improvements during and after the research process" (Zuber-Skerritt, 1991, p. xiv).

To achieve a practical outcome, or 'change', an action researcher will generally conduct multiple cycles using their chosen AR model. Change can be achieved both within an individual cycle, between initial and later cycles, or as the ultimate goal of the project. In AR, 'action' and 'change' are not interchangeable terms. 'Change' refers to the intended outcome of an action or series of actions in an AR project. The term 'action' may refer to gathering information or imply the development of a process that will ultimately be used to enact a 'change'. 'Change' may occur during the 'action' phase of the AR spiral, however, observable changes may not occur during every 'action' phase. The

choices made by the researcher, as well as the needs and expected outcomes of the project will reflect how often observable changes are made.

Action and research cycles do not typically occur in a linear fashion. Although the models appear neat on paper, in reality, these cycles tend to be disorganised and reflect the emergent nature of this methodology (Reason, 2006). The early AR cycles are used to gather initial, formative data. It is usual practice for these early cycles to be poorly focussed as the researcher or researchers learn about the problem being researched. As a project progresses and more is known about a problem, more specific data can be gathered, which results in the actions becoming progressively more focussed. The cycles themselves do not follow on neatly from each other. Instead there are often many cycles within cycles. Some cycles last the whole project, whilst others only occur during a short space of time within a particular part of the project (Dick, et al., 2000). There may be periods where only small observable changes occur, even though a large amount of learning is taking place and the project is progressing quickly through multiple action and research cycles. At other times, large changes can occur, in the space of very few cycles. The amount of observable change depends on the needs and purpose of the project, how much is known, and how well participants work together (Dickens & Watkins, 1999).

Participative qualities

The extent to which participants take part in the AR process is a fundamental issue and a choice that the action researcher must make. Most forms of AR seek higher levels of participation than methods which involve participants only as informants[11] (Dick, 2000e). However, while some proponents argue that without full participation a project is not truly AR (Greenwood & Levin, 2007; Somekh, 2006), most voices in the debate recognise that it is limiting to regard full participation as obligatory in AR. Instead, many argue that in real world applications of AR, the level of participation should reflect the needs of the project being undertaken, and should be treated as a conscious design choice (Costello, 2003; Dick, 2000e; Swepson, 1998).

In a discussion on participation in AR projects, Dick (2000e) presents seven levels of participation as an example of some of the participation choices available to action researchers. He suggests that when considering content development, the level of participation could range through four levels:

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[11] The participants are used as a source of data only.

1. Informants – participants provide data

2. Interpreters – participants interpret data

3. Planners and decision makers – participants plan change

4. Implementers – participants implement a plan/change

Participants may also be involved in the research process itself. In this case they could be:

5. Facilitators – participants manage the process of data collection and interpretation

6. Researchers/co-researchers – participants design and run the study

As a seventh example of participation, Dick refers to the way in which participants could be involved in the research process, the content development, or both.

7. Recipients – participants are kept informed about the study and its implications.

The seven levels of participation described by Dick show that when participation is treated as a design choice, rather than an ideological necessity, the level of participation will depend on a variety of factors, such as the desired outcome of the project and the resources available. As participation has a value in its own right in AR (Dick, 2000e), it is up to the individual action researcher to carefully tailor the level of participation with the resources and expectations of the project.

Use of qualitative data collection methods

Due to the emergent nature of AR, it is more often associated with qualitative data collection methods, such as interviews and surveying. However, depending on the needs and desired outcomes, some projects will combine both qualitative and quantitative methods (Meyer, 2007).

Reflective practices

Reflection is embedded within all AR processes as a means of improving rigour. The necessity of reflection will be discussed in more detail during the discussion on rigour later in this chapter.

Benefits

AR has a number of benefits that make it suitable for this project. A selection of these benefits is discussed briefly within this section.

Emergent nature

One of the strengths of AR lies in its emergent nature, which is derived through the use of multiple action spirals (Dick, 2000a). As Figure 8 shows, the AR spiral provides a flexibility that allows imprecise 'fuzzy' beginnings to progress toward appropriate, 'less fuzzy' outcomes (Dick, 2000a). In essence, the AR spiral is data driven, meaning that the direction and development of a project occurs as a result of constant interaction with the emerging data (Dick, 2000c). The data-driven quality of AR is particularly beneficial in an exploratory study, where it is often impossible to know exactly where to start. The emergent nature of AR allows complex problems to be explored as data, interpretations and the resultant actions can be defined progressively as the study proceeds. In addition, the emergent nature means that the method itself can be "continuously negotiated and crafted" (Dick, 2001, p. 7) in light of the growing experience of the researcher.
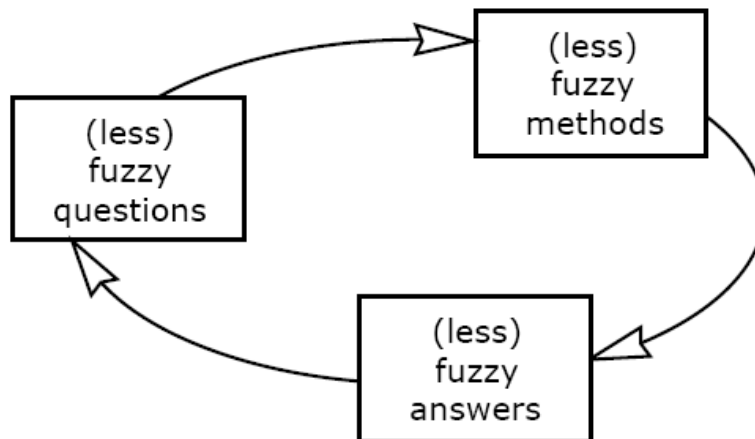
Figure 8: Fuzzy questions and fuzzy methods lead to deeper understanding, more precise questions and more developed methods. Reproduced from 'Making process accessible: Robust processes for learning, change and action research', Paper 41, Dick, B., Copyright (2002) with permission from Bob Dick.

Duality of purpose

The dual purposes of action and research that are inherent to the AR methodology are beneficial. They promote change ('action') which is based on improved understanding of the situation ('research') (Dick, 2005a). The shared emphasis on research and action means that the results are not of purely theoretical importance (Zuber-Skerritt, 1991, p. xiv).

Economies of data

Dick (2005a) notes that most qualitative research accumulates large bodies of data. With the iterative, emergent nature of AR, this would prove unwieldy and difficult to work with. However, AR offers an economy, as only the interpretations from the collected data need to be carried from cycle to cycle (Dick, 1993).

Practitioner/participant development

AR provides opportunities for personal and professional development of the practitioners and participants (Dick, 2001). As the project proceeds, those involved within the system learn, develop and put into practice their experiences. Participants benefit in a variety of ways depending on their level of participation. As co-researchers, they may experience personal and professional evolution, whilst as informers, they may simply benefit from the sharing of the outcomes of the research.

Trade-offs and limitations

The previous section explored the benefits of AR. However, as with all methodologies, there are also a number of limitations, or 'trade-offs' that must be acknowledged alongside the benefits.

Lack of replicability

AR is a qualitative and iterative methodology, which does not seek to closely control variables for comparison against each other. While there are many benefits to this lack of variable control, it does make the data collected in AR projects difficult to replicate (Dick, 2000f). However, with a strong focus on rigour that is appropriate to the AR method, quality projects can be produced, which may not be replicable, but are able to form the basis for understanding other similar situations or studies (Pope & Mays, 2007).

Local over universal relevance

AR, as with other forms of qualitative research, is said to be lacking in generalisability (Dick, 2000f). This lack occurs because AR generally seeks to solve problems that are relevant to a specific situation. In other words, it can be argued that the findings are only relevant to the people or systems actually studied. However, as Dick (2000f) and Ezzy (2002) point out, in the real world it is seldom that we are presented with a situation that models those created in carefully controlled situations, where only variable A can affect variable B. Therefore, Dick (2000f) asserts that

generalisability can be developed through "logical analysis, multiple case studies, or highly diverse samples" (Dick, 2000f).

Achieving Rigour

Rigour refers to the reliability and validity of a piece of research (Nicholls, 2009). Within AR, rigour is achieved through a variety of measures that aim to challenge the researcher to maintain the quality of the data collected and the conclusions drawn. As Reason (2006, p. 187) states, "quality in [AR] inquiry comes from awareness of and transparency about the choices available at each stage of the inquiry." There is continuing debate over how to name and define the qualities that constitute rigour in research that is qualitatively oriented (Meyrick, 2006; Nicholls, 2009). Although the language may differ, there are a number of reoccurring qualities within the qualitative and AR literature that are thought to contribute to rigour (Jeanfreau & Jack, 2010; Meyrick, 2006; Nicholls, 2009; Reason, 2006). Four of the main qualities and some of the methods used in AR to achieve these will be discussed in this section.

Credibility

Credibility "refers to the confidence in the truth value or believability of the study's findings" (Jeanfreau & Jack, 2010, p. 616). The cyclic nature of the action spirals is particularly important in providing credibility in AR. In each cycle the action spiral (Dick, 1997; Dick & Swepson, 1994):

- Tests the data and interpretations created in earlier action cycles
- Continually critiques and refines the methods and interpretations, especially during the reflective phase
- Seeks out data that does not 'fit', which can be used to challenge data that has already been collected
- Allows access to the literature, which can be used to challenge or confirm emerging interpretations.

Another important technique often used in AR is data triangulation, where a dialectic[12] is created between two different sources of information (Dick & Swepson, 1994; Fotheringham, 2010). Other

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[12] The art or practice of assessing the truth of a theory, through discussion and logical disputation (McLeod & Hanks, 1985).

techniques include discussing the research with peers or participants and being aware of data that does appear to 'fit' with the other data collected (Dick, 1999; Jeanfreau & Jack, 2010).

'Validity' or 'Dependability'

As AR is an emergent process, the questions, relationships and purposes of the project may evolve as a project progresses (Reason, 2006). Therefore, an 'audit' trail, which documents consistency in how data were collected, analysed and responded to, is important as a way of recording the process from data to conclusions. In keeping with the emergent nature of AR, it is particularly important that any deviations from these data collection or analytical processes are "described and justified" (Meyrick, 2006, p. 803).

'Trustworthiness' and 'Internal Validity'

'Trustworthiness' or 'internal validity' encompasses the idea that the results of a project should reflect the data. This quality relates to the internal logic and consistency of the research or argument within the research (Punch, 2005). In other words, there is a need to show that the outcomes are reflective of the data collected. Punch (2005) describes three main features that contribute to this quality:

1. The research has internal consistency. In other words, there is a smooth, logical progression throughout the reporting of the research, showing how it fits together.
2. The findings are shown to be consistent and coherent. This means that the way the findings have been developed is clearly described, including consideration of disconfirming[13] evidence. In addition, the findings are compared within the collected data.
3. There is evidence to show attempts by the researcher to limit their own bias. For example, member checks may be conducted, where the participants check the data collected (for example, a transcript of an interview) or interpretations. Or the findings may be reviewed with a third party who has experience in the field of interest.

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[13] Data that challenges the validity of beliefs or hypotheses.

Critical Reflection

Critical reflection is key to ensuring that confidence can be placed in the conclusions drawn (Dick, 2002b; Meyrick, 2006). In AR, critical reflection is generally a major component of the action cycle as it provides many chances to correct potential errors (Dick, et al., 2000). Critical reflection also allows AR to balance the value placed on flexibility with the desire to create meaningful outcomes through the development of an understanding of why and how choices have been made (Reason, 2006).

'Transferability' or 'Applicability'

This quality refers to whether the findings are generalisable to other settings or situations. It is largely dependent on the internal validity of the study, although internal validity does not ensure that research is generalisable. While many proponents argue that you cannot generalise qualitative research, most agree that studies may form the basis for understanding other, similar studies (Dick, 1995; Nicholls, 2009).

Influences on the action research methodology used in this project

It has been emphasised throughout this chapter that AR is an 'umbrella' term for a variety of methodologies. There was no single AR methodology or method that was suitable for this particular project. However, AR, as an emergent method is flexible enough to be adapted to the particular needs of the project and the resources available (Costello, 2003; Dick, 2000f; Swepson, 1998). Wide reading on AR as a methodology and method was conducted and the particular model used was developed from this exploration of the literature.

The model of AR used in this project does not follow a previously described methodology. As is common in AR, the methodology and methods used had to be adapted to this specific project. The methodology developed draws heavily from the writings of Dick through his on-line AR course, which is offered free through Southern Cross University (Dick, 2009b) as well as his collected writings (Dick, 2005b, 2009a). The model described in these papers was influential due to the strong emphasis on research that is driven by the data, situation and people. In addition, the emphasis placed on flexibility within the design of a project, as a means of tailoring the methodology and methods to suit the needs and resources available, was meaningful. The focus on methodologically appropriate rigour was also significant, due to the academic requirements of this project. Lastly, the appropriateness of Dick's (1993) proposed action model (see Figure 5) was highly influential in shaping the format of the action cycles used within this project.

Other AR influences came from the writings of Costello (2003) and Reason (2006). The egalitarian ideals of democracy outlined in the Participatory AR model were influential (Kemmis & McTaggart, 1988; McTaggart, 1997), although they were not able to be realised within this particular project. Additional influences from outside the AR literature were drawn from various works on Grounded Theory (Charmaz, 2011; Dick, 2000d, 2003; Ezzy, 2002). Like AR, Grounded Theory is a 'bottom up' research approach. The term 'bottom up' refers to the fact that the researcher seeks to generate theory from the data, rather than testing a hypothesis (Jeanfreau & Jack, 2010; Meyer, 2007). The works on Grounded Theory were particularly influential during development of the methods of data analysis that were used in this project, as Grounded theory has well developed analytical procedures for drawing theory from data. A brief discussion outlining the choices made with regards to key factors of AR, such as the role of the participants and the choice of action cycle can be found in the next chapter.

Conclusion

In this chapter the needs of this project have been discussed. A brief overview of the history of AR and the diversity that defines AR in the present day has been explored. The shared qualities that are common to all representations of AR have been examined, as well as the benefits and limitations and trade-offs that occur with the use of AR. The chapter was concluded with a brief discussion on rigour and the influences behind the AR methodology that shaped this project. The next chapter will discuss the methods used and how the AR model was applied to this project.

CHAPTER

FOUR

Method

Introduction

This chapter describes the methods used in this research project. Throughout the chapter, explanations regarding how the qualities of AR were applied to the methods are given, where appropriate. An explanation of the methods of data collection is given, which includes a description of the participants and a brief overview of the role played by the literature. An account is given of the methods used for data analysis. The chapter concludes with an overview of how rigour was maintained within this project.

Participation in action research

As mentioned in the previous chapter, participation has a value in its own right in AR (Dick, 2000e). There are a variety of levels of participation that are available within an AR project (see page 32). Participation is therefore a design choice and the extent of participation should be carefully tailored to match the resources available with the desired outcomes of the project (Dick, 2000f; Swepson, 1998). The exploratory nature, and the limited resources available, as well as the acknowledgement of time as a precious resource to busy practitioners, all influenced decisions regarding the level of participation appropriate to this project.

Level of participation within this project

The level of participation used within this project was low compared with other AR methods, for example Participatory AR methods. The participants fulfilled the role of informants and to a lesser degree, recipients. For this reason, the participants in this project will henceforth be referred to as 'informants[14]'. The low levels of participation were deemed appropriate during this phase of the development of the resource (see page 7 for an overview) as the purpose of this project was to explore the content and presentation requirements for a web-based resource. Although a more collaborative approach was desirable, the resources available were not conducive to this. For example, the informants interviewed all had busy professional lives, and only one researcher was available to conduct the interviews. Coordinating a time for all the members of a group of interest to meet was logistically challenging, especially without the ability to compensate informants for their time. In addition, collaboration was not a priority at this stage of the project due to the nature of the

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[14] The participants are used as a source of data only (Dick, 2000e).

'action' phase at this stage of the overall project. During this part of the research project, the 'action' was not about changing a system. Instead the 'action' was to identify the important features needed in the content and presentation of the resource, in order to create a framework that could be used as a starting point for future change.

Data Collection

Interviews

A semi-structured interview approach was used. This approach has been described as "sticking loosely to a recognizable plan, but allowing for deviations where the interviewee decides that new information is needed," (Nicholls, 2009, p. 640). Informants were selected based on their experience, area of interest, their willingness to participate and the information needs identified by the researcher.

Expert informants were sourced initially through experts known to the researcher, project supervisors and other Unitec staff. Suggestions for further contacts were provided by the informants. This method of generating contacts is referred to as 'snowballing' or 'nominated, network sampling'. This form of sampling involves informants suggesting other people known to them as potential participants for the study (Jeanfreau & Jack, 2010). An attempt was made to increase the variation within the samples by not using every contact suggested. Instead, the experts suggested were reviewed in light of the expertise of those already interviewed. Additional informants were contacted based on whether or not they would increase the variety of informants participating in the project. The benefit of the snowball method is that it has been shown to be helpful in assisting potential participants establish trust with the researcher and the research study (Jeanfreau & Jack, 2010). The researcher purposely sought to establish a baseline of trust through sourcing contacts from an established network, as the network of practitioners with a special interest in chronic pain is small, and the practitioners have high workloads. This meant that contacting practitioners was difficult without an introduction through someone known to them. Even with an introduction, the busy schedules of some potential informants made it impossible to include them. For example, it would have been interesting to speak to an anaesthetist, to bring a different perspective on dealing with individuals with CLBP. However, the suggested anaesthetists were not available for interview.

Informants were initially approached by phone or e-mail, and a brief outline of the project was given, including the aim of the project, the nature of their involvement (an interview) and the

expected time commitment. Upon agreeing to consider participating, informants were e-mailed an information pack including; (a) details about the project and (b) a list of the indicative questions to be discussed in the interview. Where possible, the information pack was sent a minimum of 7 days before the interview. On the day of the interview, informants were given a printed copy of the information sheet and asked to sign a consent form. Two copies of the questions (one each for the researcher and informant) were brought to the interview to maintain the focus of the interview. As this was a semi-structured interview, the informants were not required to answer the questions in order, nor were all the questions directly asked if the topics had been addressed through discussion earlier in the interview. Instead, the written questions were used as prompts during the interview to remind both the informant and researcher what information or opinions were being explored. Within the interview, additional questions were asked based on the informant's responses, where relevant to the development of the resource. The audio from each interview was digitally recorded with the permission of the informant. In addition to the audio recording, keywords and phrases were noted by the researcher during the interview.

Semi-structured interviews enable highly detailed, in-depth information to be collected (Nicholls, 2009). This type of interview avoids the pitfalls of structured interviews, where responses are heavily influenced by the wording and grammar of questions (Packer, 2010). Semi-structured interviews are also beneficial in that they allow the informants considerable latitude in their responses, as well as enabling the researcher to elaborate on and clarify questions, thereby allowing the freedom to specifically cater the questions for the individual being interviewed (Packer, 2010). These benefits made the semi-structured interview appropriate as a research method for this study.

Ethics

An essential part of the research process is the consideration of ethical issues related to data gathering and dissemination of the findings. The study was reviewed and approved by the Unitec Research Ethics Committee (UREC) (see Appendix A). All informants received an information sheet that outlined the aims, purpose and time commitment involved in their participation (see Appendix B and C). All informants provided their written informed consent (see Appendix D).

Informant grouping

The informants were grouped based on the type of information sought from them during the interview. All the interviewees from a particular group of informants formed what was referred to as

an 'interview sequence'. There were three interview sequences, which corresponded to the three groups of informants interviewed. These groups are described in the following section.

The informants

Two groups of experts and one group of individuals with non-specific CLBP were interviewed. Experts were defined as those who had extensive skills or knowledge about the topics of interest (McLeod & Hanks, 1985). A list of the possible topics of interest was created during the proposal stage. The initial list included:

- Pain
- Biopsychosocial messages
- Adult education
- Online education
- Instructional design
- Other topics as necessary

The final list of topics evolved to reflect the cluster-themes, themes and sub-themes identified in the chapter on 'findings and discussion' on page 62.

The experts included were divided into two groups. Each group formed a separate interview sequence.

1. **Expert practitioners**: Those practitioners with a special interest in chronic pain, especially chronic LBP, who included an educational component within their everyday interactions with patients.
2. **Other experts**: Those people who had expertise in other areas pertinent to the project such as web design and e-learning. For the sake of simplicity, this group is referred to as 'other experts' throughout this thesis.

Expert practitioners

Expert practitioners were sourced primarily from the greater Auckland region. However, the snow-balling method of recruitment did lead to the inclusion of two experts from outside this region. One in a medium-sized town in New Zealand's North Island, and one based in Queensland, Australia. The Australian was included with the rationale that New Zealand and Australia are closely culturally related. The interviews were conducted between January 2010 and November 2010. The length of

time between interviews was mainly influenced by the availability of the practitioners and the researcher.

Table 1: A brief description of the expert practitioners

Stakeholder number	General Information	Area of expertise
1	Manual therapy practitioner, lecturer at a large educational institution in the Auckland region.	Neurophysiology of pain; education
2	Physiotherapist working in a large hospital in the Auckland region.	Chronic pain management
3	Pain nurse working in a large hospital in the Auckland region	Pain management specialist within a hospital setting. Focus on pharmaceutical and psychosocial interventions as well as nurse education.
4	Pain nurse working within a specialist pain clinic in the Auckland region	Education in psychosocial aspects of pain management.
5	Psychologist working at a large educational institution in the Auckland region	Specialist in chronic pain. Lecturer in psychosocial and neurophysiological aspects of

	46	pain.
6	Osteopath from the North Island of New Zealand	Special interest in treating chronic pain, particularly LBP. Published work in this area.
7	Osteopath from Queensland, Australia	Special interest in treating chronic pain, particularly LBP. Has completed advanced tertiary study in chronic pain.

Other experts

Other experts were sourced from both the greater Auckland region and Queensland. This was due to both expert and researcher availability. The interviews were conducted between January and March 2011.

Table 2: A brief description of the other experts

Stakeholder number	General Information	Area of expertise
8	On-line educational expert working at a large educational institution in Queensland	On-line education
9	Web-designer	Web design
10	Professional medical education writer	Production of educational materials for medical practitioners and patients

Individuals with non-specific CLBP

Individuals with CLBP were recruited by convenience using 'word of mouth'. Individuals were classed as having CLBP if they had had continuous LBP for 12 weeks or more that was not due to an identifiable pathology. Individuals were excluded if they had training in a health-related profession. Two individuals with non-specific CLBP were interviewed. In the ethics application, it was stated that 'a person other than the researcher will approach Individuals with LBP to ask for their assistance in the study to reduce any feelings of obligation to participate.' However, the two individuals interviewed approached the researcher and expressed their wish to participate out of interest in the project, when they heard about it through the researcher's personal network.

Table 3: A brief description of the individuals with chronic low back pain

Stakeholder number	Description
11	Male, 20s, on-going disabling non-specific CLBP. High fear of pain.
12	Male, 50s, 20 year history of non-specific CLBP, which had spontaneously resolved 3 years prior to interview. Managed CLBP after changing psychosocial approach to pain, to a problem that had to be managed rather than resolved. Change occurred as a result of discussion with manual therapist.

The role of literature

A limited, preliminary early literature review was conducted. Some AR researchers make the decision not to access the literature before starting their project. Instead they choose to access it only once they begin to collect and analyse data (Davis, 2003). However, due to the specialist nature of the content in this project, an initial literature review was conducted to identify and understand the literature most directly relevant to the resource. This included accessing literature on subjects such as the neurophysiology of pain, to ensure a background understanding of the topics. This knowledge enabled more in-depth discussions with the expert practitioner.

The majority of the literature was gathered throughout various action cycles, as data was gathered and analysed. This is common in AR where the literature review, data gathering and analysis are not individual processes that happen at different stages of a project. Instead, the majority of the

literature is gathered once data collection and analysis are underway (Davis, 2003). In this project, the literature was accessed more or less continuously throughout the research process.

The accessing of literature throughout the life of a study is a commonly used strategy in AR, where interpretations, ideas and actions are commonly derived from both the interview data and the literature (Davis, 2003). Dick (1995) suggests that literature can be thought of as a form of data in AR, and can be treated as such. When literature becomes data, it can become part of the critical reflection process as the findings of the interviews provoke specific lines of enquiry in response to queries and questions that arise. Dick (1995) advocates that using literature as data can help a researcher reach conclusions with more confidence, and create actions that are better informed. In this project, the literature was used to search for challenging or confirming arguments, at the same time that tentative conclusions began emerging from the data.

Accessing the literature

Journal articles: Literature was accessed both for the literature review and for comparison with themes emerging from analysis of expert interviews. A mixture of systematic searching supplemented by hand-searching was used. The systematic searches allowed the researcher to develop a high level of familiarity with all the major concepts within the subjects of interest. Hand searching through relevant articles created breadth of content. Systematic searching of the literature was conducted through the use of an extensive search of the electronic search tool known as 'multi-search' using appropriate keywords. In addition, some data based searches using 'ScienceDirect' and web-based searches using 'Google' and 'Google-scholar' were conducted. The first 150 articles retrieved were scanned for usefulness. If there continued to be useful articles appearing after the first 150 articles were scanned, then articles continued to be scanned in blocks of 20, until at least 10 articles of a block were deemed irrelevant. Usefulness was based on title, then abstract, then full text, where it was possible to access it. Where it was not possible to access an article either through the Unitec library or the Unitec inter-loans system, the article was excluded. Hand searching of the references in relevant articles, where appropriate, was also conducted.

Resource Recommendations: Resources and journal articles recommended by informants were sourced where possible, and included if relevant.

Patient resources: A search of the patient resources and self-help books available for CLBP was conducted through the on-line catalogues of the Unitec Library, the Manukau-City libraries and via Google, using a variety of key-word search terms. The available books and websites were perused to

identify whether they included information on how pain works and psychosocial elements. Resources were chosen for inclusion based on:

- Recommendations by expert practitioners
- Inclusion of pain and psychosocial information within the material
- Whether they were designed for use as patient education resources by practitioners
- Whether the information contained within them was supported by the literature.

Data analysis

Initial data analysis and data collection occurred concurrently. The data was analysed using a number of techniques, which were incorporated into the AR action cycle. The following section outlines the benefits of initial data analysis that occurs concurrently with data collection. This section also describes the action cycle model and the methods of data analysis used in this project.

Argument for concurrent data analysis and data collection

Data analysis occurred concurrently with data collection, as is often the case in research methods that are interpretive or exploratory by nature, such as AR (Ezzy, 2002). Concurrent data collection and analysis occurs because it is not possible to know all the important research questions, sampling dimensions or theoretical concepts before beginning data collection. Instead, these elements are discovered as the data is collected (Ezzy, 2002). Data collection, with concurrent early analysis allowed for the collection of data that was more relevant to the generation of appropriate content. In addition, to reach data saturation[15], the data needed to be analysed or else it would not be possible to know when no more new data was emerging during collection.

Ezzy (2002) suggests a number of ways in which early data analysis can occur concurrently with data collection. Three of these were incorporated into this project.

1. Initial analysis and naive coding of data – this will be explained in detail later within this section.

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[15] In the case of the expert practitioners only.

2. Supervisor debriefing – scheduled meetings where the main findings were reported and discussed, especially where disagreement between informants in an interview sequence occurred. This debriefing is important as it:

    a. Assists in maintaining researcher awareness of the influence of personal values and theoretical orientations on data collection and interpretation

    b. Is an opportunity to explore and critique interpretations of the data

    c. Allows discussion of problems with planning and methodology early in the project

3. Maintaining a personal journal and memos – thoughts, observations and developments were recorded as they occurred. A record of the evolution of the project was maintained.

Action cycle model

There are many models of the action cycle. Many of these models were unsuitable as the 'actions' in this project consisted of interviews, literature searching and content development. This meant that the majority of the available models, which focus on actions aimed at improving a group or organisation's performance, or as a means of personal or professional development, were unsuitable as they did not match the aims of this project. A simple model was needed that could be adapted for this project. The model developed by Dick (1993) was found to be adaptable to the requirements of this project. A diagram of his model can be seen in Figure 9 (Dick, 2002b). Dick's (1993) model involves three phases: plan, act and review, with critical reflection embedded within the review and planning stage. This model was chosen because it reflected the nature of this research project: Plans were made before action. The actions were carried out and were reviewed. Between the review and planning stage, the findings (and to a lesser extent, the method) were reflected upon in light of past actions and the desired end point of the project.
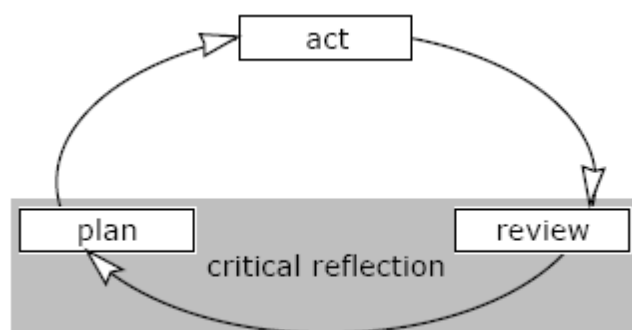
Figure 9: Dick's preferred model of action research (Dick, 2002b). Reproduced from 'Making process accessible: Robust processes for learning, change and action research', Paper 41, Dick, B., Copyright (2002) with permission from Bob Dick.

51

Cycles within cycles

An AR action cycle does not occur as a single discrete process. Instead, there are cycles, within cycles (Dick, 2002b). One cycle does not necessarily lead directly onto another cycle. Some cycles last the whole project, while others occur only within a short space of time. For example, each interview created an AR cycle. Each group of interviews formed an interview sequence, which created an interview sequence cycle. The interview sequence cycles were contained within an even larger overarching content development cycle, which fed into the resource development cycle. A simplified version of the 'cycles within cycles' concept can be seen in Figure 10.

Key

▢	Interview
▢	Interview Sequence
▢	Content Development

Review   Plan

Plan

Review

Act

Review   Plan   Review   Plan

Act   Act
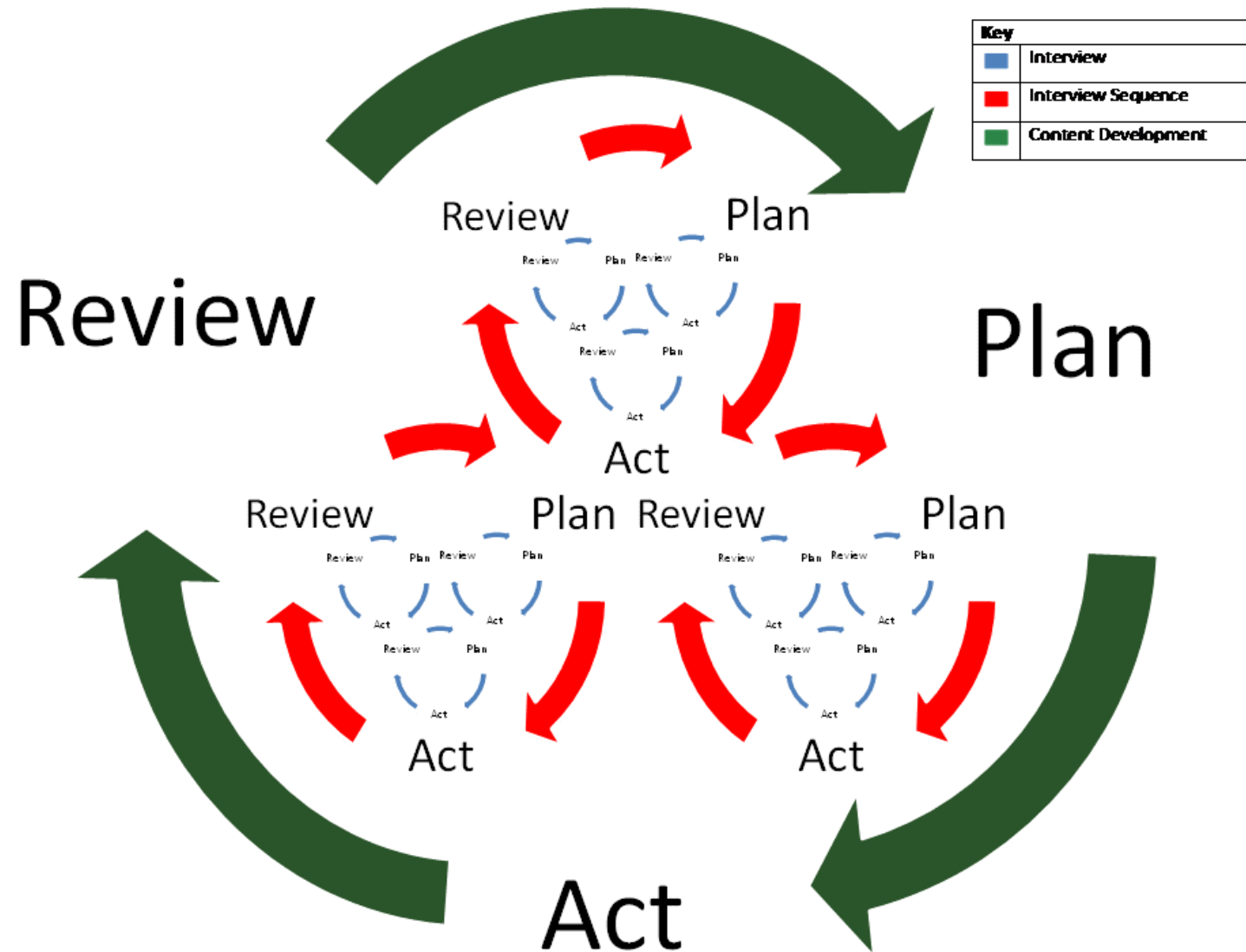
Figure 10: Simplified diagram representing the 'cycles within cycles' concept in action research. Image inspired by Dick's (2000b) description of action research cycles

Analysing the data: Individual interviews

Preliminary data analysis commenced the day after each interview and consisted of three components:

1. *Condensation of the data.* 'Condensation' of the data refers to the process of shortening the dialogue while preserving the core meaning (Graneheim & Lundman, 2004). The process of condensing the interviews was conducted in the following way.

   a. On the day following the interview, the audio recording of the interview was listened to once through with no interruption.

   b. Following this, the interview was listened to for a second time. During the second run-through of the interview, the spoken dialogue was condensed into a written summary that aimed to maintain the manifest content[16] with the inclusion of some verbatim quotes.

   c. The written summary was then compared with the notes taken during the interview. Where interpretations differed between the summary and the interview notes, a record was made.

   d. The recording of the interview was then listened to for a third time. The written summary was compared with the audio recording to check that the summary preserved the meaning of the interview. Particular attention was paid to areas where the summary and interview notes appeared to diverge and changes were made as appropriate.

   e. Some literature was gathered during this initial stage of analysis. The majority of the literature sourced at this stage was used to deepen the understanding of the researcher when new or unfamiliar topics emerged during the interviews. The literature collected as this stage was not generally compared against the data.

2. *Initial data analysis.* The emergent nature of this project meant that themes were not decided on prior to data analysis, instead they emerged from the data. Therefore, 'thematic analysis' was the chosen method of data analysis. Thematic analysis involves coding, which is the 'process of identifying themes or concepts that are in the data' (Ezzy, 2002, p. 86), by

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[16] The description of the content closest to the dialogue (Graneheim & Lundman, 2004).

disassembling and reassembling the data. The first step in the coding process is often referred to as 'naive coding' (Ezzy, 2002). Initial coding is used for the initial identification of themes within the data. Initial coding involved the following steps.

    a.   Prior to data analysis, general topics were determined, which is common in thematic analysis (Ezzy, 2002). For example 'neurophysiology of pain' and 'psychosocial elements' were the two major topics decided on prior to naive coding of the expert-practitioner interviews.

    b.   The condensed text from each interview was read through and recorded under the major topics decided on prior to naive coding (see step a). For example, under psychosocial or neurophysiology of pain categories in the case of the expert practitioner interview analysis.

    c.   Within the pre-determined general categories, similar ideas were placed together.

    d.   Naive codes were deduced through interaction with these similar ideas.

    e.   Naive codes from previously analysed interviews were used where the data appeared similar, although the comparisons between interviews were only on a superficial level during this early stage data analysis.

3. *Completion of data collection.* Data were collected until saturation was reached, in the case of the expert practitioners. The interviews with the other experts and individuals with LBP were used to develop a starting point for the next phase of the project. While saturation was not reached within the latter two interview sequences, strong repetitive patterns emerged.

Once all the interviews in a sequence of interviews, such as the expert practitioner sequence, had been completed and naively coded, the interviews in that sequence were formally compared and analysed.

Analysing the data: Interview sequences

1. Charting of the coded data was performed as a means of identifying the similarities and differences between ideas, incidents and discussion points brought up during the interviews with different informants. Charting is a method of rearranging the data according to the appropriate part of the thematic framework (Pope, Ziebland, & Mays, 2007).

    a.   One chart was created for each interview sequence. The charts were created on A3 paper once an interview sequence was completed. Each participant was

assigned a different coloured pen. The 'naively coded' data from each participant was used. Similar naive codes from each participant were grouped together in the same area on the page. Apparent contradictions were noted with red circles drawn around the text. The audio recording of each of the interviews was then listened to again, while looking at the participant's colour coded text on the chart. This was done to ensure that what was said in the interview was representative of what was shown on the page. Particular attention was paid to the dialogue involving areas of contradiction. Changes were made as appropriate.

b. A second chart was created from the first. This chart was used to summarise all the similar codes on the chart into succinct categories of like ideas. Where appropriate a new term was created to label the category or one of the naive codes was used to label a section of like ideas. Some verbatim quotes and summarised dialogue were retained on this chart for added clarity.

c. A table was created using the data from the second chart. This table summarised the information on the second chart and made the information easily accessible.

d. Disagreement between informants was initially dealt with by listening to the original audio dialogue of the informants. The 'manifest content' and 'latent[17] content' were checked against the apparent disagreement. If concordance could not be found after listening to the original audio dialogue, the disagreement was discussed with the supervisors. If no resolutions could be made regarding how to resolve the disagreement, the key aspects of the disagreement were pursued in the literature. Continuing disagreement at this stage resulted in either a conscious choice to use one argument over the other, with justification, or a note to include further questions on the point in question during the next phase of the project.

2. The data was triangulated with the literature, in order to search for agreement and disagreement. The table created from the second chart was used to compare the literature to the findings from the interviews. Literature from each of the topics was

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[17] Refers to the underlying meaning of the text (Graneheim & Lundman, 2004).

sourced as previously described. The literature was analysed for themes in common with the analysed data as well as unique information. The literature was used to inform and add to any data gathered during the interviews. Where disagreement was found it was noted, then explored, and discussed with the project supervisors if necessary.

3. A table of the initial content outline was created as an end-point of this project. The end-point of this project is designed as the starting point for phase 2 of the long-term plan for the development of the resource.

Using the action spiral for data analysis

An example of how the action cycle was combined with the methods of data collection and analysis can be seen in Table 4.

Table 4: Example of integration of action cycle with data collection and analysis

Plan	Act	Review	Critical reflection
Informant chosen. Interview time and location arranged. Questions sent to informant for perusal.			Notes were made on: - Interview questions that needed modification - Interview technique - Disagreements between participants - Agreements between participants - Any methodological issues encountered
	Interview conducted. Brief notes taken during interview.		
		Initial Interview Analysis: On the day following the interview manifest content of the interview was summarised through multiple replays of the audio recording and comparison with notes taken during interview.	

Issues of rigour

In AR, rigour is approached through a variety of measures that aim to challenge the researcher to maintain the quality of the data collected and conclusions drawn. The measures taken to preserve rigour in this project are described in detail below.

Credibility

    a. Multiple action spirals were undertaken. These allowed early findings to be tested in later cycles, with constant critique and refinement of the methods and interpretations occurring in the reflective phase of the cycles.

    b. Disagreement within the data was sought within each interview. These disagreements were dealt with as outlined in the section on data analysis.

    c. Concurrent data collection and data analysis allowed the interview questions to be modified to address and delve deeper into disconfirming[18] data as it arose.

    d. The data was triangulated[19] through the use of informants from different backgrounds and comparison of findings with the literature. Patterns of convergence were looked for to develop or corroborate interpretations. Triangulation is a generally accepted means of ensuring the comprehensiveness of a set of findings. It is more controversial when used as a test of the truthfulness or validity of a study (Pope & Mays, 2007).

Validity/Dependability

An audit trail documenting the how the data was collected and analysed was created. The procedures used are described in the data collection and analysis sections. Notes on the data and the methodological process, as well as the thoughts of the researcher were recorded in an electronic journal. The notes made were similar to 'memos' made in the grounded theory literature. Memos are notes made by the researcher referring to their developing thought process surrounding the codes as they are developed from the data (Ezzy, 2002; Finlay & Ballinger, 2006).

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[18] Data that challenges the validity of beliefs or hypotheses

[19] 'Triangulation involves the comparison of the results from either two or more different methods of data collection (e.g. interviews and observation) or, more simply, from two or more data sources (e.g. interviews with members of different interest groups).' (Pope & Mays, 2007, p. 90).

Confirmability/Trustworthiness

An effort was made to preserve the internal validity of the findings and to limit the personal bias of the researcher. For example:

e. Member checking[20] was conducted in an attempt to partially control for the personal bias of the researcher. Member checking was conducted during the interviews themselves. At the end of the interview, or at the end of a long section of dialogue, a verbal summary was made by the researcher, which the informant was invited to respond to and correct if necessary. Ezzy (2002) identifies this technique as a means of including rigour early in a project. Although it would have been beneficial to re-interview participants or send them a written summary of the interpretations following the interview, this was not practical due to the busy schedules of most informants. The difficulty in contacting busy practitioners is not unique to this project. For example, it was a difficulty acknowledged by Street et al,. (2007) who used an AR inspired approach to develop a web-based information resource for palliative care.

f. Comparative analysis was used to check the findings between different informants and against the literature.

g. Disconfirming evidence was sought, reflected upon by the researcher, discussed with the supervisors and investigated within the literature, before a decision was made on how to treat it.

h. The audio recordings of the interviews (raw data) were listened to and compared with the findings on multiple occasions throughout the data analysis process to reduce the chance that the original meaning was lost.

Critical reflection

Critical reflection was embedded into each action cycle resulting in constant analysis of the method and findings. There is always the possibility that a researcher's beliefs and values may influence a study, especially in a study such as this, where the researcher is the instrument of data collection (Finlay & Ballinger, 2006). Self-awareness and the critical reflection encompassed within the

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[20] Member checking is a technique in which the researcher checks their interpretations of the data with the participant. It can occur during or after the data gathering process (Ezzy, 2002).

iterative nature of the action cycle provided many chances to recognise and correct for personal bias. In addition, discussions of the results as they emerged throughout the process with the project supervisors provided a forum for researcher preconceptions to be acknowledged and discussed.

Conclusion

This chapter illustrated how the methods chosen for data collection and data analysis within this project were enveloped with the AR methodology. The role played by participants in this project was described and a justification was made for the use of the term 'informants'. An account was given of the methods of data collection and data analysis. The chapter concluded with an explanation of the ways in which rigour was maintained.

CHAPTER

FIVE

Findings and Discussion

INTRODUCTION

This chapter outlines and discusses the findings of the interviews and compares the findings with the current literature. The chapter is divided into three topics. The majority of the material is covered within the two main topics: (1) 'Content'; and (2) 'Presentation'. A third minor topic: (3) 'Why individuals access the internet for information on LBP' supplements the two main topics. These topics are explored through a number of cluster-themes, themes and sub-themes. Interview excerpts[21] are included for illustration purposes.

Topic 1 discusses the content. The results were derived mainly from analysis of the expert practitioner interviews. Where relevant, the opinions of the individuals with CLBP were included.

Topic 2 discusses the issue of presentation. The results were derived from the interviews with the other experts and the individuals with CLBP. Additional comments from the expert practitioners were included where relevant.

Topic 3 provides a brief overview of why individuals with CLBP access the internet to learn about LBP. The results were derived from the interviews with individuals with CLBP.

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[21] 'Excerpt' refers to an extract from the raw data (interviews).

TOPIC 1: CONTENT

Introduction

The expert practitioners all identified education was an important component of their treatment approach.

"Physical modes of treatment alone are not very efficient for treating chronic pain. They just do maintenance treatments, but don't do anything in the long-term to benefit patients."

Overall, there was high consensus between the expert practitioners regarding what content would be useful in a web-based educational resource for CLBP. The analysis of the expert practitioner interviews resulted in the identification of two main cluster-themes, a number of themes and sub-themes. These cluster-themes, themes and their sub-themes represented the content that the expert practitioners identified as useful to include in an educational resource for individuals with CLBP. The cluster-themes are:

1. Treatment in a chronic condition
2. Barriers to treatment

These cluster-themes contain a number of themes and sub-themes. This chapter explores each of these cluster-themes, themes and sub-themes in depth.

Cluster-theme 1: Treatment in a chronic condition

Introduction

In chronic conditions, the purpose and goals of treatment change. All the practitioners explained that it was important that individuals in their care understood that treating chronic conditions required a change in treatment focus. For example, one practitioner remarked:

> *"[I] Stress that the goal of treatment is to manage pain, put it in its place, not necessarily remove it completely. The aim of treatment is to improve function. No single medication will take pain away."*

The purpose and goal of treatment change because chronic pain cannot be 'cured' (Loeser, 2006, p. 2480). For many individuals, the fact that treatment will not necessarily result in a cure is a new concept(Loeser, 2006). As one practitioner explained:

> *"People want to know when their pain is going to stop. Sometimes it's the first time they've heard that it may not stop."*

Redefining the aim of treatment requires the individual to shift their treatment expectations from a focus on 'cure' to a focus on 'management' (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002). This shift is essential to ensure that LBP is not the controlling aspect of an individual's life. As one practitioner explained:

> *"It's okay to have pain and ... it's difficult to imagine a day when they're not going to have any pain at all. We need to aim for something where they're able to function...despite having pain."*

Redefining the purpose of treatment is beneficial as it has been shown that an individual's treatment expectations play a role in their motivation, compliance and satisfaction with treatment (Main, Foster, & Buchbinder, 2010). However, it is a personal choice to accept that the purpose of treatment changes in chronic conditions. The practitioners identified two main areas of content, which they believed would be useful to include in an educational resource. The aim of the suggested content is to assist individuals to address misconceptions and clarify the purpose of treatment in order to change their perception of the meaning of treatment. The topics within this cluster-theme are addressed within two themes entitled: 'Reconceptualising 'pain' in a chronic condition' and 'Self-management of CLBP'.

Theme 1: Reconceptualising 'pain' in a chronic condition

Introduction

Many individuals hold misconceptions about the purpose of pain. These misconceptions are not beneficial to treatment and need to be addressed. As one practitioner explained:

> *"Patients need to realise that pain isn't always there for a reason. [It is] Not necessarily doing more damage."*

In order to explain why pain, *"isn't always there for a reason,"* the practitioners all identified the need to reconceptualise the way individuals understood the purpose of pain. The idea of using educational interventions to address misconceptions about pain has been trialled in a number of studies (Moseley, 2002, 2003a, 2003b, 2004; Moseley, Nicholas, & Hodges, 2004; Ryan, Gray, Newton, & Granat, 2010). The trials found that the effect of educational interventions that are designed to correct misconceptions about pain on outcomes (such as level of pain and disability) is small. However, the effects are significant enough to suggest that these educational interventions may have merit, especially when combined with an exercise intervention (Moseley, 2002, 2003a; Ryan, et al., 2010).

The purpose of pain: Acute versus chronic forms

Reconceptualising the meaning of pain in a chronic condition was an educational aim identified by all the practitioners. Pain is generally thought of as the by-product of a disease process, which is correct in the case of 'acute'[22] pain (Loeser & Melzack, 1999). Although acute pain is unpleasant, it has obvious value for survival. Pain signals assist an individual in identifying that they are injured or have a disease, thereby evoking a wide range of actions to stop the pain and treat its causes. For example, one response to pain is to encourage an individual to rest, which promotes the body's healing processes. Another effect of the pain experience is the avoidance of potentially dangerous situations through the invocation of memories of earlier pain and suffering (Melzack, 2001). The difference between acute and chronic pain, is that the latter is no longer linked with ensuring survival (Melzack, 2005).

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[22] Pain associated with an injury. It is often defined as pain that lasts for 6 weeks or less (Loeser & Melzack, 1999).

The difference between acute and chronic pain can be illustrated through a statement made by one practitioner:

> *"It [chronic pain] is pain that has gone on longer than the expected healing time."*

This quote illustrates an essential difference between acute and chronic pain. For example, if an individual cuts their hand, they will experience pain around the site of the cut. As the injury heals, the pain will generally decrease. Once the injury has healed, the individual will expect to experience no more pain. This expectation is not characteristic of chronic pain, which is often associated with little or no discernable injury or pathology (Melzack, 2001). One practitioner explained the concept of chronic pain to his patients by stating:

> *"Chronic pain is not a finite thing. It is not like acute pain. There is no specific end-point to indicate when it may stop."*

The lack of association with an injury or pathology means there is no healing process that will eliminate the pain. Rather than being a by-product of a disease process, chronic pain becomes a disease in itself (Loeser, 2006). The mechanisms that underlie the development of a chronic pain state are still poorly understood (Melzack, 2001).

The practitioners indicated that one of the most important aspects of the reconceptualisation of chronic pain was to explain that the experience of pain was not linked to an injury. The idea of pain not being linked to an injury is important because it explains why chronic pain does not resolve.

The practitioners also identified that the resource should clarify what is known regarding the cause of chronic pain. In most cases, the exact cause of the chronic pain is not identifiable, due to the complexity of chronic pain mechanisms (Melzack, 2001). One practitioner acknowledged:

> *"Patients need to know that they will not always find a reason why they have pain."*

The inability on the part of the practitioner to confidently identify the cause of pain, is an accepted aspect of treating LBP (Airaksinen, et al., 2005). The practitioners expressed that it was important to emphasise this aspect of LBP in order to assist individuals to focus on managing their condition, rather than searching for an elusive diagnosis.

Reconceptualising the neurophysiology of pain

Many individuals hold misconceptions regarding how pain works (Goubert, et al., 2004). These misconceptions are associated with negative responses to pain, such as heightened fear of pain and catastrophising (Main, et al., 2010; Urquhart, et al., 2008).

Beliefs about the extent to which pain can be controlled are considered to be among the most powerful determinants of how well an individual adjusts to pain (Main, et al., 2010). The correction of fundamental misunderstandings about the neurophysiology of pain have been shown to play a role in mediating the influence of pain and depression (Hochlehnert, et al., 2006; Main, et al., 2010; Moseley, 2003a).

The expert practitioners identified the neurophysiology of pain as an important component of an educational resource. The majority of the practitioners included explanations on the neurophysiology of pain in interactions with their patients. The nurses indicated that they did not provide the explanations themselves, instead referring individuals to other members of their team, such as anaesthetists or physiotherapists. One practitioner justified the inclusion of the neurophysiology of pain by explaining:

> *"[You] Can't tell a person to change their beliefs [about performing activities] without giving them a reason why it might be useful to change their beliefs. The reason it might be useful is that there is a connection between their experience of pain and their beliefs. If they believe that the experience of pain is directly related to tissue trauma or injury they are not going to see how beliefs can alter it."*

Misconceptions about pain are often based on the misunderstanding that the nervous system is hard-wired and that pain "provides an accurate indication of the state of the tissues" (Moseley, 2007, p. 169). For example, one practitioner commented:

> *"If I make it more sore, I'm doing more damage. That myth is still there."*

The problem with believing that the nervous system is hard-wired lies in a failure to take into account the plastic nature of the nervous system. With a modern understanding of pain it becomes apparent that pain does not correlate well with the state of the tissues. In fact, pain is modulated by a variety of factors, which include, but are not restricted, to tissue injury (Moseley, 2007).

The result of the plasticity within the nervous-system is that an individual can experience debilitating pain, even in the absence of injury or other pathological processes (Melzack, 2005). As one practitioner explained:

> "When we are born the body is not given a manual of how the body works. Instead it has to learn from experience...[and it] may start interpreting signals in an unhealthy way."

And another stated:

> "It's not that bone there or that joint. It might have started as an injury to a particular area, but it's bigger than that now. It's in the nervous system, and it's the nervous system that is more sensitive to input."

Studies that educated individuals on the neurophysiological mechanisms underlying the pain experience showed positive effects on the beliefs individuals hold and the way they manage pain (Moseley, 2002, 2003a, 2003b, 2003c, 2004; Moseley, et al., 2004; Ryan, et al., 2010). For example, participants in the listed studies were shown to experience some normalisation of attitudes and beliefs about pain, as well as experiencing an improvement in physical performance and a reduction in catastrophising behaviours. The studies that combined the educational component within a multi-disciplinary pain management approach also reported that participants described reduced disability, reduced health care utilisation and increased self-efficacy (Moseley, 2002, 2003a; Ryan, et al., 2010).

Depth of content

All but one of the practitioners emphasised that any explanation of the neurophysiological mechanisms should be highly simplified. For example:

> "Neurophys is the most difficult part to understand. You need to pitch the info at a very simplified level."

The practitioners gave various reasons for simplifying the information, including their desire not to confuse their patients, for example:

> "I don't explain a lot about the neurophysiology. In very specific cases...I'll explain, but you lose people pretty fast once you get down to that level of detail."

Another reason was due to the difficulties associated with getting individuals to understand complex material, if they only have a very basic understanding of their body:

> *"It can be very difficult to get people to understand the mind-body connection. Although it [pain] may have started as an injury to a joint or area, the pain is now in the nervous system. The nervous system has been sensitised so chopping the bit off won't make the pain go away."*

Or as another practitioner explained:

> *"People's illness beliefs certainly limit the breadth of the discussion you can have because they have to try and understand it from their own world view."*

The practitioner who suggested including a more complex explanation of the neurophysiological mechanisms of pain in the resource was an advocate of the studies conducted by Moseley (2002, 2003a, 2003b, 2003c, 2004; 2004). This practitioner advised basing the content on the book "Explain Pain" (Butler & Moseley, 2003), which provides an in-depth, plain language explanation of the neurophysiology of pain for individuals and practitioners.

One study (Moseley, 2003c) found that although practitioners commonly believed that their patients could not understand complex information on the neurophysiology of pain, it was not necessarily true. The study compared the ability of health professionals to estimate the ability of their patients to understand the neurophysiology of pain with the patients' actual ability to understand the information. The study found that health professionals significantly underestimated their patients' comprehension abilities. Although this was a well conducted study, it was unclear how complex the material used for educating the individuals was.

Difficulties associated with content on the neurophysiology of pain

The majority of the practitioners emphasised that it was also necessary to ensure that individuals did not misinterpret the information communicated to them. As one practitioner explained

> *"People often mistakenly believe that you are trying to tell them that pain is "all in my head". You need to try and avoid this pitfall."*

Further research is needed to clarify the depth of material that is appropriate for a web-based educational resource.

Pain: The mind-body connection

The International Association for the Study of Pain (IASP) defines pain as, "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (Merskey & Bogduk, 2002, p. 210). The expert practitioners all highlighted the importance of using this definition, as it associates pain with both the physical and emotional domains. The practitioners unanimously agreed that it was important that individuals with chronic pain understood that pain was not a purely sensory experience. One practitioner stated:

> *"I think the biggest thing for where we are in our current understanding is getting away from thinking only in terms of biomechanical pain, hence the definition "an unpleasant sensory and emotional experience."*

The practitioners believed it was important that individuals with CLBP understood that the mind and body did not operate as separate entities. For example:

> *"The mind-body connection is important [although] many patients lack this basic understanding. Patients need to realise that pain is more than just 'wear and tear' in a joint. [We] need to stress the emotional and individual aspects of pain."*

The practitioners indicated that it was important that individuals with CLBP understood that pain was not based solely on 'pain signals' sent from a site of injury to the brain. Instead they advocated that individuals should be re-educated to understand that pain is a complex sensation. Pain is not only physical; memories and emotions are integral to the experience (Main, et al., 2010). One practitioner highlighted the mind-body connection by explaining:

> *"What happens in our mind affects our body and what happens in or body affects our mind."*

While another practitioner stated:

> *"Pain will affect mood and mood will affect pain."*

The impact of 'mood' on the pain experience

The reasons for understanding the importance of the emotional aspects of pain have been well substantiated in the literature. There are multiple examples of mood affecting the experience of pain. For example, studies on the connection between the severity of chronic pain and anger (Bruehl, Burns, Chung, Ward, & Johnson, 2002; Carson et al., 2007; Okifuji, Turk, & Curran, 1999),

found that anger targeted toward certain things has a significant impact on pain severity. In particular, it was found that after controlling for background variables, the intensity of anger directed toward oneself was significantly related to increased pain severity and depression (Okifuji, et al., 1999).

The expert practitioners identified beliefs and memories as another important factor in conceptualising the mind-body experience.

> *"One's previous history of pain will affect the pain experience in the present."*

An individual's beliefs and previous pain experiences can have an impact on the current pain experience. This means that an individual's response to pain is influenced by both their beliefs about pain and the emotional significance they attribute to the experience of pain (Main, et al., 2010). The expert practitioners thought that a simple explanation on the impact of beliefs and memories on pain, would be a useful addition to an educational resource. One practitioner suggested an interesting computer based analogy that he used with his patients. The analogy is designed to explain the mind-body connection and how memory is integrated into experience of pain.

> *"...so you get the pain here [body part], but once the signal gets here [the brain] that's when everything starts to get complicated because of the all the files (I go into computer-related analogies here) that are open on the desktop [conscious brain] and as soon as you get that pain your brain immediately starts flicking through the files that aren't open on the desktop [memory and emotions] and it doesn't tell you it's done it. And that's one of the reasons why we end up with a much bigger reaction than we thought we were going to get because it's accessed all this [other] information."*

The impact of memory and emotions on the experience of pain appears to be much greater in chronic pain (Carson, et al., 2007; Main, et al., 2010). Research into acute LBP has not found the same correlations between memory, emotions and the pain experience. For example, only modest correlations have been found between pain intensity and other factors such as pain-related fear and disability (Main, et al., 2010).

The impact of pain on 'mood'

The impact of 'pain on mood' in CLBP has also been well established in the literature. For example, depression has been found to be associated with the development of chronic pain. Depression is also well correlated with higher levels of pain intensity in CLBP and is a potent risk factor for

increased levels of disability. It should be noted that although there is a strong link between the presence of depression and the development of CLBP the link is not causal. More research is still needed to establish the exact mechanisms underlying the association. Linton (2011) advocates that it may be useful to view depression as a force that catalyzes pain problems.

Pain: An individual experience

The practitioners unanimously agreed that the individual nature of the pain experience was a key component of explaining pain to individuals. For example:

> *"It [pain] is an emotional and sensory experience. It's also an individual experience."*

Reinforcing the idea of pain as an individual experience was identified as important in assisting with the creation of individualised management strategies. As everyone is different, there is no 'one-treatment-fits all' approach to managing CLBP. Instead a trial and error, individualised approach is needed to work out what strategies are appropriate for the individual. One practitioner explained:

> *"It is up to the individual. They don't always get it right. [I] stress that this is part of the learning process. [It] is finding out where their limits are."*

One of the individuals with CLBP also highlighted the individuality of the pain experience. He noted that acknowledging that his CLBP was different was important, both in itself and as a way of explaining why he had to tailor his management plan to his particular experience of CLBP. He explained:

> *"The thing with lower back pain is that it's one of those non-specific things. It could be anything and everyone is slightly different, so my back pain is different from other people's back pain. What works for some people may not work for other people. For example, some people have back pain from sitting down for too long; I have back pain from standing up too long."*

Theme 2: Self-management in chronic low back pain

Introduction

Self-management can be described as an "individual's ability to manage the symptoms, treatment, physical and psychological consequences and life style changes inherent in living with a chronic condition" (Barlow, et al., 2002, p. 178). In chronic conditions, self-management is an important component of treatment, as it is the individual who manages their own day-to-day care (Bodenheimer, et al., 2002; Cooper, Smith, & Hancock, 2009). Encouraging self-management was regarded as an integral component of an educational intervention. As one practitioner explained:

> *"They're not going to get rid of it [CLBP]; they're going to have to learn to manage life with it."*

And another practitioner stated:

> *"It's about giving them the tools to help them manage it."*

Encouraging self-management involves the creation of a collaborative environment in which a healthcare practitioner supports an individual to find the greatest quality of life (Bodenheimer, et al., 2002). This support is provided through assistance with the acquisition of the skills and confidence that the individual requires to manage their own condition (Bodenheimer, et al., 2002; Cooper, et al., 2009). For example, one practitioner described self-management as:

> *"Giving people as much control of the situation as possible is important, with support."*

The practitioners also emphasised the importance of explaining that there is not one 'magic bullet' treatment:

> *"There's not one magic answer. It's a bit of this, a bit of that."*

Instead, they advocated that a combination of techniques was needed, with effort on the part of the individual to figure out what worked best for them:

> *"They learn to use the techniques that are best for helping them control aspects of their individual lives."*

The expert practitioners also emphasised the importance of providing a variety of techniques, skills and advice that showed where small changes could be made. Small changes are generally more manageable. For example, one practitioner stated:

> *"People are often looking for some, for the Holy Grail, some major thing that's going to make the difference and it's often just a bit of fine-tuning."*

The focus on self-management is not surprising as research into chronic conditions consistently shows that, "how well patients manage chronic pain depends more on what they do than on what is done to them" (Jensen, Nielson, & Kerns, 2003, p. 477). Self-management has been identified as a critical component of managing chronic conditions by health agencies throughout the Western World (Jordan & Osborne, 2007). In New Zealand, it is a core action area of the New Zealand National Health Committee's plan to address chronic disease in New Zealand (Holloway et al., 2007).

Self-management as part of a web-based intervention does have precedence. A web-based 'Chronic Disease Self-Management Program', designed by the Stanford University School of Medicine (Lorig, Ritter, Laurent, & Plant, 2006), has been shown to be effective in changing health-related behaviours and improving health statuses. The programme was 6-weeks long, and involved approximately 25 participants at each intake, with a commitment of 1 to 2-hours per week. At a 1-year follow-up it was found that participants displayed significant improvements in health status. Although this study was only an early attempt at a new self-management delivery mode and was generically targeted toward 'chronic disease', rather than CLBP, the initial results are promising. The results suggest that there is potential for self-management to be usefully included in a resource, such as the one proposed.

The individuals with CLBP also highlighted the importance of creating an individualised management approach to self-management. The informants explained that their LBP was a learning process that consisted of much trial and error over a period of time. For example:

> *"It's a culmination over many years. It's little things, like, I won't do that because it will make my back hurt. It's simple things."*

The practitioners identified a number of core areas in which individuals could modify their beliefs or behaviours in order to better manage their CLBP. These areas were self-efficacy, sleep management, relaxation techniques, activity management, medication management and ergonomics. Each of these areas will be discussed briefly below.

Self-efficacy

The practitioners identified that the most important aspect of self-management was assisting individuals in believing that they had the power to take control. This included helping individuals come to the realisation that the pain would not necessarily go away.

> *"It [pain] will not necessarily go away, but you can take control of it."*

In the literature the concept of taking control is described as 'self-efficacy', although this term was not specifically used by any of the practitioners interviewed. Self-efficacy can be defined as "the confidence to carry out a behaviour necessary to reach a desired goal," (Bodenheimer, et al., 2002, p. 2469). Self-efficacy beliefs have been found to play a central role in decisions concerning strategies to cope with pain, made by individuals with chronic pain (Asghari & Nicholas, 2001; Jensen, et al., 2003). Self-efficacy beliefs have also been found to play a role in improving physical performance and pain tolerance in individuals with chronic pain (Asghari & Nicholas, 2001; Bodenheimer, et al., 2002; Jensen, et al., 2003).

Patient education programmes that include self-management skills have been shown to improve self-efficacy. Programmes that include self-management skills have also been shown to be more effective in improving clinical outcomes than programmes that only provide information (Bodenheimer, et al., 2002). Targeting the content of this resource at improving self-efficacy levels may be an important consideration when writing the content, as well as an important outcome measure of the impact of the resource.

Sleep management

Sleep problems are a common complaint of individuals with CLBP. A recent review (Kelly, Blake, Power, O'Keeffe, & Fullen, 2011) found that more than 50% of individuals with CLBP complained of sleep disturbance. The expert practitioners all stated that they considered sleep management to be a high priority in any education programme:

> *"Sleep's such a biggie. If you sleep badly what are some of the useful pointers to try and improve the quality of your sleep? I think that's important."*

Although sleep disturbance is extremely common in chronic conditions, it is currently unclear whether the disturbances are the cause or an effect of chronic pain (Nicholas, Molloy, Tonkin, & Beeston, 2000). What is known is that sleep is vital for tissue restoration and energy conservation

(Kelly, et al., 2011). Sleep deprivation has also been linked with heightened pain perception, reduced pain tolerance and pain thresholds, even in populations unaffected by chronic pain (Kundermann & Lautenbacher, 2007).

The majority of the expert practitioners discussed sleep management strategies with their patients, or referred them to books such as 'Manage your Pain' (Nicholas, et al., 2000). This book is based on the chronic pain management programme used by the Sydney Pain Management Centre.

Three of the practitioners used the term 'sleep hygiene' to refer to an individual's sleep habits, which is a commonly used term in the literature (Blake & Kerr, 2010). For example:

> *"Sleep hygiene is getting people to think about their habits. So things like alcohol, nicotine, all the stimulants – when do they have their last cup of coffee, or caffeine drink? When do they have their evening meal? Do they have a routine that cues them into winding down at the end of the day? Is their bedroom an activity centre?"*

Poor sleep hygiene, or insufficient time made available for sleep are both common causes of daytime sleepiness, which is the most common symptom of a sleep disorder (Blake & Kerr, 2010). Identifying poor sleep hygiene is an important component of treating sleep disorders (Blake & Kerr, 2010). A sleep diary[23] is often used to build a picture of an individual's sleep habits, which can then be discussed with an individual's healthcare practitioner to identify areas that can be improved.

Two of the practitioners felt that a 'sleep diary' would be a useful addition to a web-based resource. This is an area where the research suggests that a web-based format has benefits over a traditional, written format (Blake & Kerr, 2010; Stone, Shiffman, Schwartz, Broderick, & Hufford, 2003). Web-based formats can have compliance-enhancing features, such as setting up reminder alerts to fill in the diary (Stone, et al., 2003), which improves the individual's ability to accurately self-monitor their sleep patterns (Blake & Kerr, 2010). These compliance enhancing features can substantially increase the usefulness of the diary. For example, in a study (Stone, et al., 2003) that compared compliance rates between paper and electronic diaries, it was found that compliance with an electronic diary was 94%, whereas the paper diaries had a reported compliance exceeding 90%, while the actual compliance was 11%. Accurate self-monitoring is beneficial as it allows the individual to become

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[23] A sleep diary is a record of sleep details, which is usually filled in over a two week period (Blake & Kerr, 2010).

more aware of their own habits. This awareness creates additional benefits in the form of improved collaborative decision making between individuals and their healthcare practitioners (Blake & Kerr, 2010).

A sleep diary and information on monitoring personal sleep hygiene would be a potentially useful addition to a web-based educational resource.

Relaxation techniques

The practitioners all advocated the use of relaxation techniques. This is unsurprising as many people with chronic pain find that their medications are inadequate (Breivik, Collett, Ventafridda, Cohen, & Gallacher, 2006), or the side-effects are intolerable (Morone, Lynch, Greco, Tindle, & Weiner, 2008). Therefore many individuals find that alternative techniques, such as relaxation, meditation and mindfulness[24] are often adopted as additional or primary approaches to pain management (Chen & Francis, 2010; Morone, et al., 2008; Persson, Veenhuizen, Zachrison, & Gard, 2008). The specific techniques discussed within the interviews varied, as the practitioners also emphasised the importance of knowing a variety of techniques, which could be tailored according to individual preference. As one practitioner stated:

> *"Different things work for different people. It could be as simple as a breathing exercise, scanning the body for tension, muscle relaxation or creative visualisation; finding a 'happy place'."*

A variety of techniques have been found to be useful in the literature. For example, slow breathing has been associated with reduced pain intensity and unpleasantness (Zautra, Fasman, Davis, & Craig, 2010). Mindfulness training has been linked to symptom reduction. It has also been found to promote the use of a wide range of coping skills. Mindfulness training has also been linked with positive behavioural changes, as it promotes the recognition of early signs of activities that may exacerbate a condition (Baer, 2003).

A review of relaxation techniques and hypnosis found there was significant support for the use of hypnosis for chronic pain, and modest support for relaxation techniques (Kessler, Patterson, & Dane,

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[24] "bringing one's attention to the internal and external experiences occurring in the present moment" (Baer, 2003, p. 125).

2003). Although the results are promising, all the studies conclude that further research with more methodologically sound investigations are needed in this area (Baer, 2003; Chen & Francis, 2010; Kessler, et al., 2003).

A section that describes a variety of relaxation techniques would appear to be a useful inclusion within an educational resource.

Activity management

Managing activities was identified as one of the key aspects of assisting individuals in learning to self-manage their CLBP. Although there is no 'right' level of activity (Birkholtz, Aylwin, & Harman, 2004), all the practitioners felt that it was important that individuals were able to manage activities in a way that enabled the individual to participate in life at a level that was satisfying for them. Individuals with CLBP can mis-manage their activity levels in a variety of ways. 'Under-activity', where an individual responds to pain by decreasing their activity levels, is a common behavioural response based to CLBP. It arises as a result of the fear of the negative connotations associated with the meaning of pain, such as the belief that more severe pain indicates more severe tissue damage (Peters, Vlaeyen, & Weber, 2005). Individuals using an 'under-activity' management strategy become de-conditioned as they perform increasingly fewer activities (Moffett & Frost, 2000; Vlaeyen & Linton, 2000). De-conditioning occurs due to 'disuse syndrome', where the musculoskeletal and cardiovascular systems are not sufficiently challenged, meaning that both muscle tone and aerobic fitness decline (Birkholtz, et al., 2004). The result of disuse is a downward spiral, where individuals move less, resulting in the loss of muscle tone and conditioning, which often results in an increase in their levels of pain and disability (Peters, et al., 2005; Vlaeyen & Linton, 2000). As one practitioner explained:

> "People end up with disuse and become de-conditioned to work and activity because they're convinced that hurt means harm."

Another way in which individuals can mis-manage their activity levels is through 'over-activity'. This strategy generally results in constant pain, with occasional rest enforcing flare-ups (Birkholtz, et al., 2004). Alternately, individuals may alternate between 'over-activity and under-activity cycles' (described as the 'boom-bust cycle' by some of the practitioners). These alternating activity cycles occur as a result of the individual participating in an excessive level of activity in one period of time (e.g. a day). The period of over-activity is followed by a period of under-activity, as a result of pain.

The result is that the individual is restricted in what activities they can perform, due to the pain, during the in the next time period (Birkholtz, et al., 2004; Vlaeyen & Linton, 2000).

Education on maintaining suitable levels of activity levels was identified as a potentially useful component of an educational resource. All the practitioners associated positive outcomes, such as improved mood and a feeling of empowerment, with appropriate management of activity levels. Research has shown that maintaining activity levels can have a positive influence on CLBP through maintaining or reinforcing positive self-efficacy beliefs[25] (Birkholtz, et al., 2004). All the practitioners identified 'activity pacing' as a key aspect of educating individuals in how to manage their activities.

Activity pacing

Activity pacing is about achieving an acceptable balance between activity and rest, so that the individual is no longer controlled by their pain (Birkholtz, et al., 2004). As one practitioner described:

> "It's about breaking the link between how much you can do on a given day and the amount of pain you've got."

It is a method of self-management, which educates individuals on "how to budget their energy, alternating activity and rest periods in order to 'pace' themselves" (Gill & Brown, 2009, p. 214).

During the interviews it was interesting to note that there was variation in what the practitioners meant by the term 'activity pacing' and how activity pacing was used. This variation split those practitioners who worked within the community, and those who worked in specialist pain clinics. Variations in the approach to activity pacing are not unique to the practitioners interviewed. A recent literature review (Gill & Brown, 2009) on the evidence for pacing as a chronic pain intervention, found that while pacing is a widely used term, it "lacks consensus of definition" (Gill & Brown, 2009, p. 214). The variation in what was meant by the term 'activity pacing' is discussed below.

Activity pacing education by practitioners working in pain management clinics

The practitioners who worked in pain management clinics followed a highly structured approach to activity pacing. The structured approach involved timing certain everyday activities to find a pain-

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[25] "Judgements regarding how well one can do things" (Birkholtz, et al., 2004, p. 447).

free baseline. The baseline was then reduced by 20% to establish a pain free starting point. The baseline was increased incrementally to increase exposure to activities in a way that was pain-free, thereby breaking the pain associated with the activity. The benefits of this approach are that (a) the systematic activity increases do not depend on pain levels and (b) individuals are able to see progress through recording the increases in their baseline over time (Birkholtz, et al., 2004). As one practitioner described:

> *"We get quite scientific about it. You know the timers you can get from Dick Smith? So they measure their tolerance for an activity, take the average [over three baseline times], reduce the average by 20%. This becomes their starting point for the activity. [They do the activity], when the timer beeps they stop and do something different...it means that activities aren't dependent on the type of day they're having"*

Activity pacing education by practitioners working with the community

The practitioners who worked in community practices differed to the pain management clinic practitioners in that they used a less structured approach to activity pacing. The community practitioners advised alternating moderate periods of activity with rest, and stopping before the pain became severe. The community practitioners did not use a structured approach to define the term 'moderate', instead relying on the individual to judge appropriate activity levels through a 'trial and error' approach. For example, one practitioner described how he explained his concept of 'pacing' to his patients.

> *"Say to your patient, "Yes, you are de-conditioned. When you do something, it's going to hurt. This is a normal effect of doing something new. The discomfort may last 1-2 day," (In a really chronic patient it may last a bit longer). "Give yourself a day for everything to settle down before you re-organise another activity. This will give you a chance to increase your threshold of tolerance."*

Two exercise programmes described in the literature for individuals with chronic pain, used this less structured method of activity pacing (Lorig & Holman, 2003; Moffett & Frost, 2000). For example, one programme advised practitioners to tell participants that, "It is normal for unaccustomed exercise to cause muscle soreness, but it should gradually get better as their bodies get used to it" (Moffett & Frost, 2000, p. 296). Another programme stated that individuals should not feel worse after exercise. Instead, they should, "First, cut back on the exercise, find a comfortable exercise

level, stick to this for 1 or 2 weeks, and add to it by 10 to 20% every 7 to 14 days" (Lorig & Holman, 2003, p. 2).

The structured versus unstructured approach to activity pacing created the difference identified between the community practitioners and those working in specialist pain management teams. At first, it appeared that these two methods were conflicting. However, upon reading the literature and investigating the concept of pacing it has emerged that they are simply different approaches along a continuum. It makes sense that those who see the general population would not use such highly structured programmes, as it is less likely that their patients would stick to the suggested programme, without high levels of supervision. Whereas practitioners who work in pain management clinics are able to closely monitor their patients. In addition, practitioners in pain management clinics work on a referral only basis. Therefore, the population of patients they interact with would, theoretically, have more deeply embedded pain problems. In this patient population, a highly structured approach would probably be essential.

The issue of activity pacing still requires further clarification. It may be that both, or neither model is most useful for individuals using the proposed resource. The issue of activity pacing will be further investigated during phase 2 of the development of the resource.

Managing medication

Some of the practitioners indicated that a section on the correct use of medications would be useful. One practitioner described her reasons in the extract below:

> "People get very creative with their medications. A doctor might prescribe something and it will come with instructions on how to take it, but when people don't get the pain relief they're expecting they start to [pause]. They might just stop it, they might double it up, take it more regularly, buy something over the counter, borrow something from a family member [pause] and the cocktail starts growing and people are completely ignorant about the potential damage that medication can do to their body."

The previous extract is illustrative of the reasons the other practitioners gave for including information on how to take medications correctly; to stop individuals from creating uncontrolled "cocktails" of medication, and to educate individuals on the side effects of medications. The practitioners indicated that education on medications should include aspects of the correct use of medications such as: the importance of taking medications as directed and taking medications

according to a timetable, in order to maintain the blood levels of the medication. Three examples of the practitioner's are included below:

> *"[Individuals] shouldn't take pain relief and wait to see what happens. They need to take it [pain medication] on a timetable to block up [the chemical] receptors."*

> *"Taking medication to the clock rather than as needed is the way to go. Then you're not constantly having to appraise the pain."*

> *"People do a boom and bust thing and hold off and hold off, so when they take it [pain medication], it doesn't do anything."*

In addition, the practitioners identified that individuals should be advised to communicate with their general practitioner, regarding whether a medication was effective or not.

> *"Prescriptions are written in such and such a way for a reason. If you don't think the medication is making a difference to your pain, discuss this with your general practitioner."*

Ergonomics

One practitioner identified ergonomics as an additional area in which practitioners could positively influence the lives of individuals. He explained:

> *"[You have to] be careful about the environment you are rehabing them [patients] back into."*

While the literature is inconclusive regarding the merit of ergonomic interventions, there does not appear to be any harm in addressing ergonomics (Burton, 2005). Advice could be included on how to improve an individual's work station set-up. Ergonomic advice is aligned with the New Zealand Occupational Health and Safety requirements, which state that legally every work-place is required to minimise the health risks associated with the work-place environment (Health and safety act, 1992).

Cluster-Theme 2: Barriers to self-management

The practitioners identified a number of barriers to behavioural change and self-management during the interviews. The barriers they discussed included:

- Motivational barriers
- Psychosocial barriers
- Barriers created through the actions and beliefs of practitioners themselves.

The barriers identified by the practitioners are reflective of those barriers found in the literature (Jensen, et al., 2003; Mahomed, Patterson, & St. John, 2008; Middleton, 2004). This section gives an overview of the barriers identified by the practitioners. In addition, a brief discussion is included regarding whether aspects of the barriers can be addressed through a web-based educational resource.

Motivational barriers

Motivation to change was one of the major barriers identified by the practitioners. This barrier affects how able an individual is to change their lifestyle. For example, one practitioner explained:

> *"As much as people say they want to make changes, when it comes down to the actual nuts and bolts of it, you know, you don't often find people really following through on stuff."*

Or as Jensen et al., (2003, p. 477) explained "because learning and then practicing chronic pain self-management is very challenging, the changes necessary for adaptive pain management are unlikely to occur in the absence of significant patient motivation". Lack of motivation may arise from a number of factors. For example, some individuals may not be ready to accept that there is not a 'magic bullet' cure for CLBP:

> *"In chronic pain people need to get to the bit of acceptance before they can move onto the treatment of it, and some people are just not ready."*

These individuals can be described as 'passive self-managers' (Zufferey & Schulz, 2009, p. 30). They are convinced that a solution to their problem can be found by their healthcare practitioner, and they are not yet ready to actively self-manage their condition (Zufferey & Schulz, 2009). An in-depth exploration into the stages of motivation and behavioural change, and how education can affect these stages, would be interesting during Phase 2 of the development of this resource.

Another issue surrounding motivation is the effort associated with changing. One practitioner explained that one aspect of motivation that she experienced on a regular basis was that individuals felt they needed to make major changes in their life, which were just too difficult. She explained that:

> *"[You] Need to show people where they can make small changes...Stress the importance of fine-tuning rather than large, unrealistic, life-altering changes."*

Individuals are unlikely to change maladaptive coping strategies for adaptive self-management strategies, unless they believe that the maladaptive strategies will result in negative outcomes and self-management strategies will result in positive outcomes (Jensen, et al., 2003; Middleton, 2004). For example, for regular exercise to be seen as an important coping strategy, an individual has to believe that the benefits of exercising (e.g. improved muscle tone) will outweigh the potential problems associated with exercising regularly (e.g. short-term increases in pain) (Jensen, et al., 2003).

Methods for overcoming motivational barriers

Record-keeping was mentioned by two of the practitioners as a method for overcoming motivational barriers. A digital form of record keeping (progress reports) could be incorporated into the resource. As one practitioner explained:

> *"Keeping records is something you can incorporate into your programme. It should be separate from a diary because sometimes a diary becomes a bit of a whinge-fest and reminds people of all the things they're not doing. Whereas, if it's some way of keeping records, so that when they go back to a programme they can add information to it, so they can reflect back on it and say, "Oh yeah, I've made some progress here."*

Keeping records is a commonly used self-management technique as it provides of a history of progress for individuals (Jensen, et al., 2003; Nicholas, et al., 2000).

Another commonly used motivational tool that was found in the literature, but not mentioned by the practitioners, was the use of incentives. Individuals can 'reward' themselves for self-managing their pain, for example, they can schedule a fun activity after exercise (Jensen, et al., 2003). It has been found that individuals who include incentives as a part of their self-management programmes are more likely to maintain self-management practices (Jensen, et al., 2003). Whether explanations

or advice on how to use incentives should be incorporated into an educational resource, requires further research and discussion during Phase 2 of the development process.

Psychosocial barriers

The majority of the practitioners identified the importance of psychosocial factors, such as the tendency to catastrophise, depression and fear of pain, as barriers to self-management. The issues identified are consistent with those found in the literature (Asghari & Nicholas, 2001; Campbell & Edwards, 2009; Koleck, Mazaux, Rascle, & Bruchon-Schweitzer, 2006; Waddell, 1987).

The psychosocial barriers were not discussed in-depth with the practitioners, as it was not initially believed that the content of the resource would be aimed at addressing these barriers. However, a recent review (Gremeaux & Coudeyre, 2010) of the internet as a source of health information found positive effects, such as increased activity levels and an improved ability to modify unfavourable lifestyle habits associated with the sites that were included in the review. Web-sites that incorporated a cognitive-behavioural approach to education were found to have an even greater effect on the individuals using them (Gremeaux & Coudeyre, 2010). In addition, this section on psychosocial factors was included because the practitioners believed that awareness of the issues was important. For example, one practitioner stated:

> "[In CLBP] there's the isolation, the catastrophising and there's the fear of the pain and what's happening."

After discussion between the supervisors and researcher, it was decided that a brief overview of the barriers identified should be included in this section for completeness. Further investigation into the psychosocial barriers to self-management and how a web-based resource can be used to affect these barriers, will be conducted during phase 2 of the development of the resource.

Depression

Depression was identified as a common psychosocial barrier to self-management in CLBP (Koleck, et al., 2006). One practitioner described some of the problems associated with depression:

> "One of the big things with people with chronic pain is that they don't want to do anything. It makes them withdraw from social and family and work responsibilities because of the pain. We want to help them manage it so that they don't become socially isolated."

The practitioners described a variety of techniques that they found useful in assisting individuals address their depression in order to assist with self-management. One commonly mentioned technique was the use of short-term goals. One of the practitioners identified this by explaining:

> *"Dealing with isolation links in with the goal-setting and activities they want to get back into and so on. Just in the process of goal setting they can reconnect."*

Setting short-term goals is a commonly used strategy in addressing many psychosocial aspects of CLBP (Birkholtz, et al., 2004; Lorig & Holman, 2003). Advice on how and when to set short-term goals could be included in a web-based resource.

Seeking additional help from a trained mental health professional was another strategy that the practitioners indicated may be helpful. For example, one practitioner explained:

> *"People have seen multiple specialists looking for an answer about why they've got their pain and there may not be an answer for them and that can be very depressing for them. They may need psychological help to deal with this."*

However, the practitioners did not view the inclusion of a mental health professional as a necessity in cases where depression was found to play a role in an individual's CLBP:

> *"I wouldn't generally refer them to a psychologist. I would tell them the service exists...in a special case, if I thought they were suicidal then you have a legal obligation. Otherwise it must be the patient's decision."*

Fear of pain

Fear associated with pain was mentioned by many of the practitioners. It has long been established that fears can play a role in disability, although fears have a less significant affect on the severity of pain experienced (Carson, et al., 2007). In the context of specific beliefs about the meaning of pain, anticipation of pain can create unhelpful patterns of escape and avoidance, which result in some control of pain. However, the cost of patterns involving escape and avoidance is unnecessary pain-associated limitations of movement (Main, et al., 2010). For example, even after allowing for severity of pain, fear-avoidance beliefs about work have been shown to account for 23% of the variance of disability in activities of daily living and 26% of the variance of work loss (Waddell, Newton, Henderson, Somerville, & Main, 1993).

It is currently unclear whether a web-based educational resource could be of assistance in addressing limitations created through a fear of pain. Further research and discussion with practitioners is needed to clarify this psychosocial factor during Phase 2 of the resource design process.

Catastrophising

The effects of catastrophising on pain were identified as factors that individuals should be made aware of. Catastrophising can be broadly defined as "an exaggerated negative "mental set" brought to bear during painful experiences" (Sullivan et al., 2001, p. 52). Or, as one practitioner stated:

> *"Catastrophising is really, 'All my worst fears are confirmed by what's happening to me and the sky really is falling in.'"*

Catastrophising about pain and the fear of pain can lead to a preoccupation with pain and a heightened awareness of pain signals, thereby directly increasing pain perception (Peters, et al., 2005). Catastrophising during painful stimulation has been found to contribute to a more intense pain experience and increased emotional distress (Main, et al., 2010). Limiting catastrophising has been shown to be important for improving motivation (Jensen, et al., 2003). A web-based educational resource has the potential to assist with decreasing the level of catastrophising, for example through the correction of misconceptions regarding how pain and tissue injury are linked (Jensen, et al., 2003).

Barriers created through the actions and beliefs of practitioners themselves

All the expert practitioners interviewed had a special interest in pain. All the expert practitioners identified that one of the biggest potential barriers to appropriate treatment was the misconceptions that many healthcare practitioners hold about pain:

> *"Many nurses are prejudiced against chronic pain because they can't see anything wrong with a person."*

> *"Many practitioners are taught the neurophysiology of pain but have no idea how to apply it."*

> *"Research shows that practitioners catastrophise and have a fear of pain in excess of their patients, and their advice does not match the evidence."*

The practitioners interviewed were all chosen because they all had a specific interest in CLBP and chronic pain management, and had received additional training in these areas. However, within the general population of healthcare practitioners, the lack of knowledge surrounding chronic pain management has been well documented within the literature. There are a variety of examples which show that, in general, healthcare practitioners demonstrate considerable misconceptions regarding their understanding of chronic pain and how best to treat it (Ali & Thomson, 2009; Shaw & Lee, 2010) and treatments for CLBP (Slade, Keating, & Molloy, 2009).

The lack of knowledge shown by many healthcare practitioners has implications for the design and implementation of a web-based resource. During phase 2 of development, a decision will need to be made regarding whether practitioners using the resource will require additional training before they are able to recommend the resource to their patients. The resource is intended as a supplement to treatment, not a stand-alone intervention. Therefore, to ensure that individuals can use the content found in the resource to complement their interactions with their healthcare practitioner, it is important to ensure that their practitioner's understanding of chronic pain and LBP management are aligned with the content presented in the resource.

TOPIC 2: PRESENTATION

Introduction

This topic focuses on the factors associated with how to present a web-based educational resource. The majority of the interview data were gathered from the 'other experts'. Within this topic, the other experts are referred to using the term 'informants'. In instances where the data was derived from the 'expert practitioners' and 'individuals with CLBP', the latter two groups are identified by name. Three main cluster-themes were identified during the data analysis process. These were:

1) Functionality,
2) Presentation features
3) Emerging technological trends.

A number of themes and sub-themes are contained within these cluster-themes. The cluster-themes, themes and sub-themes are discussed in detail within this chapter.

Cluster-theme 1: Functionality

'Functionality' can be defined as "the quality or state of being functional" (McLeod & Hanks, 1985). To be functional, means being able to perform "the natural action or intended purpose of a …thing in a specific role" (McLeod & Hanks, 1985).This term describes the requirement of the resource to fulfil its intended purpose; to impart information to the individuals accessing it. In other words, a web-site should be 'usable'. This requirement was alluded to by the informants in a variety of ways. One informant directly emphasized the importance of 'functionality' by explaining what she felt was the key element of web-design:

> *"That's the important thing; that the website serves its purpose."*

The ways in which the informants felt 'functionality' should be addressed will be discussed throughout this section.

Accessibility/Usability

'Accessibility' was a term used by the informants to describe an important aspect of functionality:

> *"Accessibility, in a web context, is for people with disabilities. People who have some sight sort of thing that makes it hard to read. Stuff like that."*

'Accessibility' is a term that is commonly used in the web-design literature to describe the ways in which web content is made more easily available to people with disabilities, such as visual, language or learning disabilities (Caldwell, Cooper, Reid, & Vanderheiden, 2008). Although the term is most often used to describe a specific web-design principle, it encompasses the general idea of 'functionality' and is therefore a useful term under which to group a number of issues that relate to how easy it is for individuals to understand and interact with the information that is being imparted.

The term 'accessibility' encompassed a number of different aspects relating to functionality. The informants identified readability, navigability and 'connectability' as the three most important aspects of accessibility.

Readability

Making the website 'readable' was seen as a critical component of creating a successful web accessible resource. For example:

> *"… if it's informative, then it needs to be readable."*

> *"Readability is the first thing."*

Readability encompassed a number of factors that could be broadly grouped into two main categories:

1) 'Visual aspects', which referred to the actual, physical act of reading; and
2) 'Content aspects', which embodied the idea of the ease with which an individual user was able to make sense of the information provided.

1) *Visual aspects*

Two informants spoke of the importance visual features played in ensuring the functionality of a website:

> *"The most important thing about a website is to convey the information on it and so you make it accessible. You have to make it readable to as many people as possible or you've lost the intent of the website."*

There were several factors that the informants described that they believed had an impact on whether a website was readable or not. These included aspects such as font size and choice, colour scheme, graphics, web-page layout and minimal use of flashing lights. Two of these aspects will be discussed below as examples of the considerations which must be included when designing a web resource that will be appealing to a wide audience.

a. Colour scheme

 One informant described a good colour scheme:

> *"The key to a good colour scheme is to make it readable."*

Another informant explained:

> *"If you're going to put a light blue text on a dark blue background, then that can be more difficult for older people [or] anyone whose eyesight isn't perfect.*

The importance of a 'pleasing' colour scheme has been recognized in the research through the recognition of the fact that the needs of those who use websites goes beyond simple usability and utility, and becomes more about the whole experience (Moshagen & Thielsch, 2010). However, both the literature and one of the informants commented on the fact that accessibility is a very subjective experience (Moshagen & Thielsch, 2010). For example, one informant elucidated:

> *"Design is really subjective…the simple trend is on at the moment because you're trying to make the site accessible to as many people as possible."*

b. Use of conventional layouts

> *"Use conventions used on every other website. Which is [for example] basically information on a page with a 'next' button….it's what people expect to see."*

The previous quote is an example of conventional layouts given by one of the informants. The use of conventional layouts was also emphasised in the literature on accessibility in web-design. For example, the Web Accessibility Content Guidelines (WACG) {Caldwell, 2008 #346@3.2} state that pages should "appear and operate in predictable ways."

2) Content aspects

The informants all emphasized the importance of making the content readable and understandable. The informants discussed a number of aspects to ensure that the content was appropriate for the users. Reading age was mentioned by two of the informants. The WACG advise that to ensure a website is accessible, the reading age should not be more advanced than a lower secondary education level (Caldwell, et al., 2008). One informant emphasized the importance of keeping the language simple by explaining:

> *"I've heard people talk about someone's reading age, but I think it's more their reading level, or their reading aptitude in a specific area. A normal lay-person can have quite a high reading age for reading a novel, but when it comes to scientific stuff you can't just assume they're the same, because a lot of people don't do science. They come in because they want help. They don't know a lot of this stuff."*

The previous extract referred to the idea that an individual's reading level was dependant on the content of the material. The difference in an individual's reading level has been noted in the

literature, where it has been shown that a high *basic* literacy level is not necessarily reflective of a high *health* literacy[26] level (Schillinga & McDaniel, 2010).

The informants indicated that simplicity of the content should be maintained throughout a web-site. For example:

> *"Diagrams and stuff will benefit a patient. The labels should be modified or simplified for patients."*

Another aspect of content readability is ensuring that there are different levels of information. The priority was getting the critical, *'need to know'* information across, as one informant explained:

> *"Be concise in what you say. Take the relevant stuff that a patient needs to know."*

However, it was identified that the most basic information may not be satisfactory for all individuals. Therefore, a facility to provide more in-depth information is desirable for those individuals who want it. As an informant stated:

> *"Your general write-up is catered toward your average patient. Then for further information you can refer them toward more technical links that cater toward the patient who wants to learn more about their condition."*

Navigability

All the informants emphasized that a web-site itself should be easy to navigate. In addition, the individual pages should be easy to navigate and relevant content should be easy to find. As one informant explained:

> *"You don't hide information."*

'Navigability' or 'organisational quality' refer to how logical the grouping, categorisation, or structure of website elements can assist individuals in finding the information they seek (Hasan & Abuelrub, 2011; Palmer, 2002). Navigability is important, as the aesthetic appeal of a website (such

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[26] "The skills required to understand and act on health information" (Schillinga & McDaniel, 2010, p. 243).

as whether it is easy to find information), has been shown to have an impact on how individuals feel about the credibility of the content (Moshagen & Thielsch, 2010).

One informant was involved with the creation of an extensive e-learning site for an online adult education course. She commented that assisting individuals in identifying relevant information was an essential aspect of navigability.

> *"There are so many links. [Individuals want to know] what's important? What's not? What are they actually gonna use? What's optional?"*

Another aspect of navigability is how easy it is to move around and through a website. The informants explained that to create flow through a website, it was important to use common conventions. The WACG guidelines for making a website 'accessible', explain navigability by stating that websites should "appear and operate in predictable ways" (Caldwell, et al., 2008, p. 3.2). As one informant explained:

> *"Another thing to do with accessibility is about what people expect to see. So making the website really easy to navigate...by using conventions."*

Easy navigation is essential, as the success of a website is significantly associated with how easy it is to find information (Hasan & Abuelrub, 2011; Lautenbach, Schegget, Schoute, & Witteman, 2006; Palmer, 2002).

'Connectability'

The informants indicated that how quickly an individual could access the information contained within a website was a significant feature of accessibility:

> *"How well and easily is downloads is important."*

> *"If there's a lot of interactive stuff that takes a long time to download, [it] chews up the data allowance."*

The preference for short download times is reflected in the literature, where short download times are connected with increased beliefs in the reliability of a website (Hasan & Abuelrub, 2011). One of the informants, and the literature, both advocated that it may be advisable to include warnings or

alternative quick download versions, for individuals with slower connections, when it is known that something on a site will have a longer than average download time (Mackey & Ho, 2008).

Additional aspects of functionality

Additional aspects of functionality were found in the literature. For example, consistency, was described as desirable. Consistency can be described as maintaining a general page layout that is consistent throughout a website (Hasan & Abuelrub, 2011). The informants may not have mentioned some aspects of functionality due to time factors during the interview, or because they believed that certain aspects of web-design are intuitive. Or perhaps they were not mentioned, because, as one informant commented:

> *"It is likely that the actual development of the website will be conducted by an experienced web-designer, so it is not necessary to be an expert in all the features of accessibility."*

However, this section on functionality is still important, as an awareness of the issues and current trends in web-design is necessary to ensure that the content of the resource is developed with these principles in mind.

Cluster-theme 2: Presentation formats

This cluster-theme explores the use of video versus text-based media, on-line quizzes, discussion boards and emerging trends in the way individuals access the internet. The informants were asked about how they would prefer to access information (in the case of the individuals with CLBP) or to comment on the trends or preferences they noted in user access of web content (in the case of the other experts). Comments from the expert practitioners that related to the presentation of the resource were included in this section for completeness.

Video versus text-based formats

The informants all indicated that a video based format was valued as a means of accessing information. There were a variety of reasons given for favouring video. For example, the individuals with CLBP both expressed a personal preference for videos, based on their individual learning styles.

> *"That's really my style…some people want to scroll through screens of text, with the odd picture, whereas I'm the opposite. I'd rather see what was going on and how to do it."*

> *"I would prefer, instead of just sitting there reading, I'd rather watch a Youtube video on how something's done."*

The individuals with CLBP also identified the fact that a beneficial aspect of a video-style format allowed is that it allowed them greater independence in their ability to self-manage their condition. The individuals with CLBP explained:

> *"If you had an exercise and you wanted to check you were doing it right and they had a video nested into their site that would be great."*

> *"It's just like teaching someone through repetition. They can watch it more than once."*

> *"I like watching something more than once. Specifically because I don't like asking people to repeat. I learn through repetition."*

Another aspect of videos that was advocated by the individuals with CLBP was the ease with which videos can be interpreted, especially when learning techniques, such as a new exercise:

> *"Words are great, but they can be interpreted wrong. You know, one person reads one thing…two people read the same paragraph and will do different things. One person with do it [an exercise] right and the other person will hurt themselves."*

> *"If you go through and show someone an exercise with a video camera you can cut from one side to the other, or focus on a specific thing. You can accentuate an issue."*

An additional benefit of video over a text based presentation is found in the capability of videos to include large amounts of information in a shorter period of time. As one of the expert practitioners commented:

> *"Their [individuals with CLBP] tolerance for being at the computer might be quite limited, so something short and sharp becomes quite important."*

The issue of the impact of the amount of time spent in front of the computer versus the amount of information provided is an issue that needs to be explored in more depth during the phase 2 of the development process.

All the informants indicated that videos were still appropriate for those with a lower internet connection speed, although flash animation was not favoured.

> *"With a low connection speed videos are fine…flash animation can take a long time to load."*

Video clips were favoured in the literature as a useful addition to educational websites (Mitra, Lewin-Jones, Barrett, & Williamson, 2010). With sites such as 'Youtube' and other video based search engines growing in popularity, it is not surprising that videos are favoured as a means of accessing information. When used in a planned manner, video clips can bring themes to life and stimulate student interest in topics (Mitra, et al., 2010). It has been found that one of the key uses of video is to present new information in a way that enables individuals to engage actively with the subject. In a study on e-videos for tutorial purposes it was found that videos were able to challenge preconceptions held by the participants by showing alternative viewpoints (Mitra, et al., 2010). This makes videos a potentially useful presentation media when challenging the misconceptions individuals may hold regarding the meaning of pain and treatment. Another advantage of video over text-based media is that it makes use of both audio and visual processing centers within the brain, which can lead to more engagement with the content than when only one sensory system is used (Mitra, et al., 2010).

A word of caution should be offered. Although the informants were unanimously enthusiastic about the potential for video as a form of communication, it is important that the information is provided in more than one way, such as through a traditional text-based medium. Firstly, although both the individuals with CLBP interviewed discussed their preference for video, two is a very small sample size, so the preference for video may not be reflective of the CLBP population as a whole. Secondly, as one expert-practitioner explained:

> *"People learn in so many different ways that you have to try and cater to all the different ways of learning to get the message across."*

While it would not be possible to fully cater for all learning styles, it is important to have a variety of ways of accessing the information, such as video and text, to enable individuals to access information in ways that suit their individual needs. Further exploration as to what presentation styles individuals with CLBP favour will need to be a focus during phase 2 of the development of the resource.

Interacting with the content

In any learning experience, engaging with the content is important. Different individuals engage with content in different ways. As one expert-practitioner explained:

> *"Some people are very good at taking in the knowledge and doing something with it. With other people it's the practical experience."*

How to measure whether individuals are engaging with web-based educational resources has been identified as a critical area which can be used to improve resources. Simply counting the number of visits to a site is not enough.

Forums

Forums have been suggested as one possible method of engagement. However, one informant, who was involved in a large on-line educational course found that:

> *"Forums aren't used."*

The lack of forum use was also found in a review on how individuals engaged with a Swiss-Italian internet-based resource for CLBP (Zufferey & Schulz, 2010). However, although forums were not

favoured as a way of engaging with the site, the study did find that e-mail contact between individuals and healthcare practitioners was a valued feature of the site (Zufferey & Schulz, 2010). E-mail was also found to be a useful form of communication in another study that used an e-mail discussion group as part of a 6 week intervention for CLBP (Lorig et al., 2002). One informant suggested that the preference for e-mail over a forum could be that

> *"Students don't like everyone to see their questions. They would prefer to e-mail them as, they don't mind if it's just one person [who sees their question]."*

Zufferey & Schulz (2010) suggest that the reason e-mail was preferred over forums in their study, could be due to the fact that the forums were designed to promote contact with other individuals with CLBP, while the e-mails provided the opportunity to contact healthcare practitioners. Therefore, they theorised that individuals using the site may have preferred e-mail contact as they wished to seek information from healthcare practitioners, rather than other individuals with CLBP.

If an e-mail feature were included in a web-based resource, care would need to be taken to ensure that individuals knew that the site provided advice only. The advice would be intended as a supplement to, not a substitute for, a consultation.

On-line quizzes

One informant suggested that another feature that could potentially be useful in a web-based resource is the use of on-line quizzes. This informant commented on that on-line quizzes were popular with the students using a distance education site in which she was involved:

> *"They do like the on-line regular assessment thing…it tells them, almost in real time, whether or not they understand that module."*

On-line quizzes could potentially be a useful addition to the resource. They could allow individuals with CLBP (or their healthcare practitioners) to check whether the individuals with CLBP understood the information. Quizzes could also be used in other ways, for example, to find out what misconceptions individuals help before and after interaction with the content of the site. The use of on-line quizzes as a feature of an educational resource requires further exploration during Phase 2 of the resource development.

Cluster-theme 3: Emerging Trends

The informants emphasized the importance of being aware of current technological trends when designing the resource.

> *"iPads and iPhones have only been on the rise for a couple of years now and it's really changed the way people use the web."*

The rise of mobile devices (such as iPhones and iPads) is changing the way people access information. It is predicted that in New Zealand, internet access via mobile devices will soon overtake access via computers (Moore, 2010). The trend toward using 'smartphones[27]' is on the rise. In 2010, 22.8% of all new mobiles were smartphones. This figure was predicted to rise to at least 50% by the end of 2014 (Moore, 2010).

Awareness of the current technological trends and ascertaining how and where individuals will use this resource will be an important design consideration. Awareness of technological trends could have implications for the resource development. For example, if it was found that many individuals would access the resource via their smart-phones then 'flash animation[28]' would be a less favourable medium due to the fact that flash animations are not supported on all mobile devices. As one informant explained:

> *"Mobile device use is on the rise, it's huge, and Apple [mobile devices] doesn't support flash….because of battery life. Well, that's one of the reasons, the main reason; Flash takes up a lot of battery resources and the battery life would be like, 20 minutes [if flash was used]."*

Technology is always changing and evolving and the problem of battery life with flash is being addressed. Adobe, an American software company, is continually developing and up-dating its products to address the problem of supporting flash animation on mobile devices and has recently brought out up-dates designed to specifically support flash animation on mobile devices such as

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[27] A smart phone is a phone that combines the functions of a PDA (personal digital assistant) and a mobile phone. Features also include mobile broadband access, cameras and GPS navigation (Wikipedia, 2011b).

[28] Moving diagrams or cartoons that are made up of a sequence of images displayed one after the other. Uses include entertainment, ad banners and instructional sequences (Freedman, 1999).

iPhones (Adobe Systems Incorporated, 2011). Emerging technology may solve the problem of using flash animation in another way. For example, HyperText Markup Language 5 (HTML5) enables individuals to watch videos without the need for a plug-in[29] such as Flash, which has benefits for mobile devices that do not support flash, such as iPhones and Blackberrys (Mulroy, 2010).

How the current technological trends and consumer preferences will impact on the presentation and content requires further investigation. A larger cohort of individuals with LBP and other experts will need to be included during phase 2 of the development of this resource, to clarify many of the considerations pertinent to the presentation of a web-based resource.

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[29] Adds specific abilities to a larger software application. For example, a plug-in may be used in a web browser to allow a video to be played (Wikipedia, 2011a).

TOPIC 3: WHY INDIVIDUALS ACCESS THE INTERNET FOR INFORMATION ON LOW BACK PAIN

The initial aims of the project did not include asking individuals with CLBP what sort of information they chose to access on the internet. However, during the course of the interviews and interaction with the literature it became apparent that it was necessary to find out what sort of information individuals sought.

The individuals interviewed explained that they used the internet to search for specific information on topics that interested them. The individuals with CLBP indicated that they used the internet as a resource to access specific information:

> *"I'll hear about something, like a new type of painkiller and then I'll go look it up, just to make sure. Not like a hypochondriac look. Just things like, what is it? Where is it? Is it available in this country?"*

> *"I saw a sign about TENS machines for back pain and I went and looked it up on-line."*

Whether individuals would choose to access information if their healthcare practitioner recommended a site was unclear. Further clarification of the reasons why individuals choose to access the internet will form an important part of the interviews during Phase 2, to better determine what content individuals with CLBP would be most interested in accessing.

CHAPTER

SIX

Limitations and Quality Issues

LIMITATIONS

The limitations of this project are characteristic of any exploratory study. The limitations are identified and described below. The limitations will be addressed during phase 2 of the development of this resource (see overview on page 7).

1. Expert-practitioner interviews - The range of professions was not fully representative of all the professions engaged in dealing with CLBP. Time constraints (both researcher and expert), as well as resource constraints prevented the inclusion of more professions in this study. However, the addition of the views of other health professionals involved in the management of CLBP, such as GPs and chiropractors would be beneficial to add depth during the next phase in development.

2. Due to the time and resource limitations the interviews with individuals with CLBP and 'other experts' were limited in number. While repetition was seen, the literature shows that a key aspect in creating appropriate resources is involvement of the end-users (Gremeaux & Coudeyre, 2010). Therefore a more extensive data set would be useful to further investigate the needs and expectations of the individuals with CLBP. However, the main purpose of this phase of the development of the resource was to identify what content should be included in an educational resource for individuals with CLBP. The limited interviews did give a starting point and basic overview of the important aspects of presentation and why individuals with CLBP choose to access the internet. As the project evolved, the significance of identifying and responding to the needs and expectations of the individuals with CLBP became apparent and will therefore be a major focus of Phase 2 of the development process.

3. Multiple interviews with each participant were not conducted. Although unusual in AR, the decision not to re-interview was made after reflection and discussion with the project supervisors for two reasons:
   a. There was a high level of consensus between the individual informants and between the informants and the literature, with regard to the majority of the issues identified.
   b. The informants had busy professional lives and were not easily available for multiple interviews. As this was an exploratory study, it was decided that 'buy-in' for the next Phase of the resource development would be higher if the informants did not

perceive that their time was being used to gain their opinions on inconsequential matters that could be answered through reflection and interaction with the available literature.

4. The expert practitioners were not asked for their opinion on whether they thought they would refer their patients to use a resource such as the one proposed, if it were available. The majority of the informants volunteered their opinion that they thought this resource would be beneficial for their patients. On reflection, perhaps a useful initial step in the development process could have been to find out whether practitioners and individuals with CLBP thought they would use this resource if it were developed.

QUALITY ISSUES

The quality issues reduce the rigour of this project. However, by acknowledging the quality issues, it is easier to more fairly judge the value of the findings (Ezzy, 2002; Nicholls, 2009).

1. Participant bias may have been created as participants were sourced in both Australia and New Zealand. This was precipitated by migration of the researcher during the project. While this is potentially beneficial, in that it improves the transferability of the content by adding depth, it must be acknowledged that slight differences in the culture and the set-up of the healthcare systems in each country could have affected the biases and opinions of the informants. An attempt to minimise this aspect of bias was conducted through careful examination, comparison and reflection on the data gathered in each country, with a focus on disconfirming evidence.

2. Participant bias was also created through the interviews with the 'individuals with CLBP' as the informants were self-selected by volunteering to participate. This meant that they already had a high interest in accessing health information from the internet, as well as a reasonable base level of computer skills to allow them to do this.

3. The researcher's interview technique improved with each interview. As interviewing is, to some degree, a learned skill, the improvement was expected. An attempt was made to minimise this source of bias by reading about interview technique prior to the first interview.

4. The quality of the critical reflection improved as the study progressed. However, as with the interview technique, critical reflection is a learned process. The iterative nature of AR was potentially helpful in reducing the impact of an improved ability to critically reflect as the process was repeated many times, giving many chances to improve errors along the way.

5. Participants were recruited using a snow-balling method. This method has been criticised as it does not create maximum diversity (Ezzy, 2002). However, snowballing was useful as it enabled the researcher to access a network of skilled practitioners (Jeanfreau & Jack, 2010) who would otherwise have been very difficult to contact due to their busy professional lives. An attempt was made to increase the diversity of the informants, by not using every contact suggested. Instead, additional informants were only contacted if their background and profession were seen to increase the diversity of informants participating in the project.

CHAPTER

SEVEN

Conclusions

Introduction

The results of this study identified a number of cluster-themes, themes and sub-themes that were contained within two main topics; (1) Content; and (2) Presentation; and supplemented by one minor topic; (3) Why individuals access the internet for information on LBP. This chapter provides a summary of the outcomes of the study. The following chapter gives an overview of the directions for future research.

Topic 1: Content

The study identified two cluster-themes that the expert practitioners regarded as key educational areas for inclusion in a resource for individuals with CLBP: (1) Treatment in a chronic condition and (2) Barriers to treatment. These two cluster-themes were comprised of a number of themes and sub-themes. The outcomes of this topic will be briefly summarised below.

Cluster-theme 1: 'Reconceptualisation of the meaning of treatment in chronic conditions'.

In chronic conditions, the goals and purpose of treatment change. The change is partly driven by the fact that, in most cases, chronic pain cannot be cured (Loeser, 2006). When the focus of treatment no longer consists of finding a 'cure', the purpose and goals of treatment are re-oriented to focus on management, rather than cure. The expert practitioners identified two key areas which were important in assisting individuals shift their focus from cure to management:

1. Reconceptualising 'pain' in a chronic condition

Many individuals hold misconceptions about the purpose of pain. The practitioners identified four aspects of pain that could be incorporated into a resource in order to assist individuals in reconceptualising pain.

1. Explain the difference between acute and chronic pain. Acute pain is linked with an injury or pathology. A natural healing process, which can be assisted by treatment, will generally result in the absence of pain (Melzack, 2001). In chronic conditions, there is often no identifiable pathology or injury. Therefore a healing process or treatment will not 'cure' the pain (Loeser, 2006). The practitioners indicated that understanding the difference between acute and chronic pain can assist in helping individuals shift their treatment focus from a cure to management.

2. Reconceptualise the neurophysiology of pain. Many individuals hold misconceptions about how pain works, such as that the level of pain experienced is an accurate portrayal of the state of the

body tissues. The correction of fundamental misunderstandings about the neurophysiology of pain have been shown to play a role in mediating the influence of pain and depression (Hochlehnert, et al., 2006; Main, et al., 2010; Moseley, 2003a). The practitioners disagreed as to how complex the information presented should be. Further research is needed to establish the depth of content needed in a web-based resource.

3. The mind-body connection was emphasised as a significant component of an explanation of pain. Many individuals are not aware that the experience of pain is affected by both the sensory system and higher functions. In other words, pain can affect mood and mood can affect pain. The level of pain experienced is therefore not necessarily indicative of the degree of tissue damage, especially in chronic conditions. The practitioners identified the mind-body connection as an important concept, to assist individuals in understanding how their current emotional state and past experiences could have an impact on their experience of pain.

4. Lastly, the individuality of the pain experience was identified as an important facet of education for individuals with CLBP. The concept of individuality explains that there is no set 'one-treatment-fits-all' approach to managing LBP. The individuals with CLBP also identified the individual nature of their LBP as an important component of developing an individualised management strategy for their pain.

2. Self-management strategies

All the 'expert practitioners' identified the importance of providing individuals with strategies that would enable them to self-manage their CLBP. This is not surprising as research shows that "how well patients manage chronic pain depends more on what they do than on what is done to them" (Jensen, et al., 2003, p. 477). A number of self-management strategies were discussed by the practitioners.

Sleep management was identified as important by all the practitioners. Sleep disturbance is a common problem among individuals with chronic pain (Kelly, et al., 2011). Two of the practitioners suggested a web-based resource could contain an electronic version of a 'sleep diary'[30]. Studies have found that electronic sleep diaries are superior to traditional written versions (Blake & Kerr, 2010;

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[30] A sleep diary is a record of sleep details, which is usually filled in over a two week period (Blake & Kerr, 2010).

Stone, et al., 2003) as the electronic versions can include compliance enhancing features (such as reminder alerts to fill in the diary) (Stone, et al., 2003).

The inclusion of advice on a variety of relaxation techniques was advised by the practitioners. This is unsurprising as many people with chronic pain find that their medications are inadequate (Breivik, et al., 2006), or the side-effects are intolerable (Morone, et al., 2008). The practitioners emphasised that a variety of techniques should be included to cater for the preferences of individuals using the resource.

Medication management was identified as important to ensure that individuals were not creating medicinal 'cocktails'. In addition, the practitioners advised that a section on the importance of correctly using medications, and communicating with the practitioner who prescribed the medication, should be included.

Activity pacing is a commonly used self-management strategy to assist with the maintenance of appropriate activity levels. How activity pacing was defined created mild disagreement between the practitioners, related to whether they worked within a community practise, or in a pain management clinic setting. The lack of agreement was not unique to the practitioners interviewed. A 2009 review on activity pacing found that, while pacing is a widely used term, it "lacks consensus of definition" (Gill & Brown, p. 214). The community based practitioners used a much less structured approach to activity management when compared with the practitioners within the pain management clinics. It is supposed that the difference was reflective of the needs of the patients seen in the different settings. Further investigation is needed to establish which (if either) method of activity pacing is best suited for use within a web-based resource.

One practitioner identified ergonomics, such as the correct set-up of a work-station, as an important component of care. The literature on treatment for individuals with CLBP is inconclusive regarding the effectiveness of ergonomic changes (Burton, 2005). However, some individuals may find information on ergonomics to be useful. Further questioning is needed to establish, for example, whether the individuals with CLBP would be interested in using ergonomic information provided on-line.

Cluster-theme 2: 'Barriers to treatment'

The practitioners acknowledged that although education was important and behavioural changes desirable, there were a number of barriers that could hinder the ability of individuals to change their

behaviour. Three main barriers were identified, which were consistent with barriers identified in the literature (Jensen, et al., 2003; Mahomed, et al., 2008; Middleton, 2004).

1. Motivational Barriers

The expert-practitioners described a variety of potential motivational barriers. For example, an individual may not yet be ready to accept that they will not find a cure for their pain, or the effort required to make a change may appear too great. Electronic record keeping (progress reports) was suggested as a tool that could be incorporated into a web-based resource to assist in overcoming motivational barriers. Keeping records is a commonly used self-management technique as it provides of a record of progress for individuals (Jensen, et al., 2003; Nicholas, et al., 2000). The use of incentives, or reward schemes, is another commonly used technique for overcoming motivational barriers (Jensen, et al., 2003). The use of incentives is mentioned in the literature, although it was not described by any of the expert practitioners. Follow-up interviews could explore whether advice of the use of incentives could be useful in a web-based resource.

2. Psychosocial Barriers

The majority of the practitioners identified the importance of psychosocial factors (such as fear of pain and the tendency to catastrophise), as barriers to self-management. The psychosocial issues were not discussed in depth, as it was not initially believed that the content of the resource would be aimed at addressing these barriers. The practitioners did not directly suggest that a resource for CLBP should aim to address psychosocial barriers. However, they spoke of barriers such as depression, fear of pain and catastrophising, as they believed that they were important background information, and therefore anyone making a web based resource should be aware of potential psychosocial barriers. There is research to suggest that web-based education for individuals with chronic pain that is based on a cognitive-behavioural model, can address some psychosocial barriers (Gremeaux & Coudeyre, 2010). Further investigation is needed into the psychosocial barriers to self-management and how (or indeed whether) a web-based resource can be used to affect these barriers.

3. Practitioners themselves

All the expert practitioners interviewed had a special interest in pain. All the expert practitioners identified that one of the biggest potential barriers to appropriate treatment were the misconceptions that many practitioners, in the general population, held about pain (Ali & Thomson, 2009; Shaw & Lee, 2010) and treatments for CLBP (Slade, et al., 2009). The lack of knowledge shown by many healthcare practitioners has implications for the design and implementation of a web-

based resource. During phase 2 of development, a decision will need to be made regarding whether practitioners using the resource will require additional training before they are able to recommend the resource to their patients.

Topic 2: Presentation

'Topic 2' focuses on the factors associated with how to present a web-based educational resource. Expertise in the area of web-design and presentation features is not essential, as it is likely that a web-designer will programme the resource. However, an awareness of the issues and current trends in web-design is necessary to ensure that the content of the resource is developed with these principles in mind. An overview of the issues identified is presented below.

Cluster-theme 1: Functionality

The informants emphasised the importance of functionality in a web-based resource. Functionality refers to the quality of being usable. In other words, the resource should fulfil its purpose; to inform those individuals who access it. A major component of functionality is 'accessibility'. This term was used to express the idea that the information should be made easily available to as many users as possible. Accessibility encompassed a number of components, for example, the content should be readable, easy to understand and easy to find. Further discussion regarding elements of functionality will occur during the programming and testing stages of creating a web-based resource.

Cluster-theme 2: Presentation features

'Presentation features' relates to how individuals prefer to access and interact with the content. Video formats were unanimously favoured over text-based mediums, although further investigation is needed to determine how video and text-based presentations should be used. How to engage individuals interactively was also discussed. Interaction with the material was suggested through the use of a personalised e-mail advice service between practitioners and individuals using the site. If this service were included, care would be needed to ensure that individuals knew that the site provided advice only, and was not a substitute for a consultation. On-line quizzes could potentially be a useful addition to the resource. They could be used in a variety of ways, for example, to test what misconceptions individuals held prior to using the site and whether these were altered after using the site. Forums did not appear to be favoured, although further discussion would be useful to establish the opinions of those who would be using the resource.

Cluster-theme 3: Emerging technological trends

An awareness of emerging trends in how individuals choose to access information is important. The rise of smartphones, and the potential barriers associated with certain presentation modes (such as flash animation) was discussed. Technology is constantly evolving, therefore an awareness of how users prefer to access the resource is crucial, as it may impact on the design of the content and presentation.

Topic 3: Why individuals access the internet for information on low back pain

Individuals with CLBP indicated that they used the internet to search for specific information on topics that interested them, such as new medications or treatment approaches. This topic emerged during interaction with the data. It is acknowledged that it would have been useful to include in the original aims of the research. As there were only two individuals with CLBP interviewed for the purpose of this project, it is difficult to establish why individuals access the internet. Further investigation into the wants and needs of the intended users of the resource will need to be a focus during 'phase 2' of the resource development process.

Conclusion

The outcomes of this study have established a starting point from which the content and presentation of the resource can be developed. This research project created many new questions during the process of answering the original aims. 'Phase 2' of the resource development process (see overview on p 7) will aim to address or refine the questions that arose as a result of this research project.

CHAPTER

EIGHT

Directions for future research

Introduction

Phase 2 of the resource development process involves the creation of a preliminary web resource. There are a number of questions that require further exploration during the next phase of development. A variety of these questions are briefly discussed within this chapter.

1. Depth of information

One of the main features of creating a resource is that it must be 'functional' and 'accessible' to those using it. The appropriate level of complexity of the content, needs to be established. For example, the complexity of the information presented on the neurophysiology of pain was highlighted as an area that requires further investigation. The practitioners identified that many individuals have difficulty understanding explanations of the neurophysiology of pain, and disagreed on how complex the material should be. The level at which to target an explanation of the neurophysiology of pain needs to be established. In addition, how best to include links to more in-depth information, for those individuals who wish to further extend themselves, should be researched.

2. Increased inclusion of the target population

One limitation of the study was the small number of individuals with CLBP who participated. A larger cohort of individuals with LBP and other experts will need to be included during phase 2 of the development of this resource, in order to clarify many of the considerations pertinent to the presentation of a web-based resource. In addition, establishing additional information, such as the demographics of users and how practitioners may use the resource, may have an impact on the development process, as an understanding of the target population is further refined.

3. Electronic recording devices

The practitioners suggested the inclusion of electronic recording devices such as sleep diaries or record keeping devices for activity management. Whether to include these devices and how best to include them, will need to be established through further interaction with the literature and discussion with individuals who may use a web-based resource.

4. Addressing barriers to treatment

Psychosocial barriers

The practitioners identified a number of psychosocial barriers to treatment. However, it was unclear whether a web-based educational resource would be able to address these issues. Further research, and discussion with informants, is needed to clarify whether a web-based resource can play a role in addressing some of the treatment barriers.

Addressing misconceptions held by healthcare practitioners

The misconceptions surrounding pain and the purpose of treatment in chronic conditions could potentially be a barrier to the usability of this resource. It is therefore important that healthcare practitioners, who are not specialists in chronic pain management or CLBP, are consulted to find out how they would use a resource such as this. Another area requiring exploration is the possibility of including a section of the resource targeted specifically at educating healthcare practitioners, to better enable them to interact with their patients.

5. Presenting the information

The informants favoured video as a means of imparting information. However, as one participant noted, there are a variety of learning styles. Further research is needed to discover how best to incorporate videos as a presentation tool, without alienating those individuals who, for various reasons (such as low internet connections or personal preference) may prefer to access information via a text-based format.

Engaging individuals was another area in which further research is needed. Offering a service where individuals can seek advice, for example via e-mail was suggested. However, this would involve practitioner's time, either voluntarily of compensated. Discussing the best way to involve individuals in the resource should be an important focus of Phase 2, as it may play an important role in shaping or re-shaping the purpose of the site.

6. Technological trends

The question of how and where individuals with CLBP prefer to access the information needs to be established. Further research is also needed to better establish how these preferences could affect the content and preferred delivery methods (such as the use of flash-based animation or text-based information).

7. Socio-economic position of users

One barrier to self-management that was not mentioned by any of the expert practitioners was the influence of socio-economic variables. These can have a significant effect on access to interventions, the ability to act on health advice and an individual's ability to influence their own health (Burton, et al., 2004). The socio-economic variables and their impact on the demographics of who will benefit from a web-accessible resource for CLBP, requires clarification.

Afterword

'Phase 2' of the resource development process will enable the development of a working knowledge of the content and presentation issues. A working knowledge of these issues will allow the outcomes of this research project to be altered, or refined, as a deeper understanding of the issues is gained through the practical application of the outcomes of this project.

CHAPTER

NINE

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APPENDICES

APPENDIX A: ETHICS APPROVAL

Unitec
NEW ZEALAND
Te Whare Wānanga o Wairaka

phone +64 9 849 4180 fax +64 9 815 2901 web www.unitec.ac.nz
address Private Bag 92025, Auckland Mail Centre, Auckland 1142, New Zealand
Mt Albert campus Carrington Rd, Mt Albert, Auckland, New Zealand
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Sarah Dryburgh
3/34 Eastern Beach Road
Bucklands Beach
Auckland

19 November 2009

Dear Sarah

Your file number for this application: 2009-1019
Title: A concise, web-based educational resource for non-specific chronic low back pain patients

Your application for ethics approval has been reviewed by the Unitec Research Ethics Committee (UREC) and has been **approved** for the following period:

Start date: 18 November 2009
Finish date: 18 November 2010

Please note that:
1. the above dates must be referred to on the information AND consent forms given to all participants
2. you must inform UREC, in advance, of any ethically-relevant deviation in the project. This may require additional approval.

You may now commence your research according to the protocols approved by UREC. We wish you every success with your project.

Yours sincerely

pp Frances Ward
Deputy Chair, UREC

cc: Elizabeth Niven

APPENDIX A: ETHICS APPROVAL EXTENSION

Sarah Dryburgh
3/34 Eastern Beach Rd
Bucklands Beach
Auckland 2012

30th March 2011

Dear Sarah

Your file number for this application: 2009-1019

Title: A Concise, web-based educational resource for non-specific chronic low back pain patients

Your application for an extension to ethical approval has been reviewed by the Unitec Research Ethics Committee (UREC) and has been **approved** for the following period:

Start date: 18 November 2009
Finish date: 18 November 2011

Please note that:
1. The above dates must be referred to on the information AND consent forms given to all participants
2. You must inform UREC, in advance, of any ethically-relevant deviation in the project. This may require additional approval.

You may now commence your research according to the protocols approved by UREC. We wish you every success with your project.

Yours sincerely

Scott Wilson
Deputy Chair, UREC

cc: Elizabeth Niven
    Cynthia Almeida

APPENDIX B: INFORMATION SHEET FOR EXPERT INFORMANTS

Information for participants

A concise, web-based educational resource for non-specific chronic low back pain patients

My name is Sarah Dryburgh and I am a Master of Osteopathy student at Unitec. I am currently enrolled in the Master of Osteopathy programme at Unitec. I am seeking your help in meeting the research requirements of the course, which forms a substantial part of this degree. My research topic involves the development of a concise, on-line educational resource for *non-specific chronic low back pain*[31] patients. The educational resource will provide current *neurophysiological*[32] information to correct misconceptions formed through the application of inaccurate or out-dated knowledge. Additionally, aspects of the pain experience (such as the fact that bed rest is not the best cure for back pain) will be incorporated into the educational resource. The resource is designed to be used as an additional tool in usual care and is not meant as a replacement.

What I am doing

I will design the curriculum for the resource. The curriculum will then be placed into a web accessible format. The creation of the resource will be followed by a peer review and lay-person[33] review. By

---

[31]*Non-specific chronic low back pain* refers to back pain that is not attributed to a recognisable pathology (such as infection, tumour or fracture).

[32] *Neurophysiological* – the processes involved in the function of the nervous system.

[33] *Lay person* - those persons who are not professionals in IT, education or health care.

taking part in this research you will be assisting me in understanding pertinent areas of your expertise that will be used to write the curriculum for the programme.

What it will mean for you

I would like to talk to you about [insert information pertinent to their expertise and my curriculum]

The interview will take between 15 minutes and half an hour, either over the phone or at a time and place that is convenient for you. A shorter follow-up interview may be requested. The interviews will be taped and keywords will be drawn from the interview. All features that could identify you will be removed. The voice recordings will be uploaded onto a computer and stored in a password protected file. Only you, the researcher and the project supervisors will have access to any information provided.

If you agree to participate, you will be asked to sign a consent form. If you wish to withdraw any information provided, you may do so in the three weeks following the interview. Due to the time constraints of the project, no information may be withdrawn after this time. If you wish, you may ask to see the Thesis and/or the educational resource before it is submitted for examination.You will not be identified in the Thesis.

Please contact me if you need more information about the project. If you have any concerns regarding the research project you can contact my supervisors:

Sarah Dryburgh phone 021 236 2000 or email sarah.dryburgh@gmail.com
Robert Moran, phone 815 4321 ext. 8642 or email rmoran@unitec.ac.nz
Dr. Elizabeth Niven, phone 815 4321 ext. 8320 or email eniven@unitec.ac.nz

UREC REGISTRATION NUMBER: 2009-1019

This study has been approved by the UNITEC Research Ethics Committee from 18 November 2009 to 18 November 2011. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 6162). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

APPENDIX C: INFORMATION SHEET FOR INDIVIDUALS WITH LOW BACK PAIN

Unitec
NEW ZEALAND
Te Whare Wānanga o Wairaka

Information for participants

A concise, web-based educational resource for non-specific chronic low back pain patients

My name is Sarah Dryburgh and I am a Master of Osteopathy student at Unitec. I am currently enrolled in the Master of Osteopathy programme at Unitec. I am seeking your help in meeting the research requirements of the course, which forms a substantial part of this degree. My research topic involves the development of a concise, on-line educational resource for *non-specific chronic low back pain*[34] patients. The educational resource will provide current *neurophysiological*[35] information to correct misconceptions formed through the application of inaccurate or out-dated knowledge. Additionally, aspects of the pain experience (such as the fact that bed rest is not the best cure for back pain) will be incorporated into the educational resource. The resource is designed to be used as an additional resource for the treatment of low back pain by a GP or other therapist and is not meant as a replacement.

What I am doing

I will design the curriculum for the resource. The curriculum will then be placed into a web accessible format. Following the creation of the resource, professionals will be asked to review it. Once

---

[34]*Non-specific chronic low back pain* refers to back pain that is not attributed to a recognisable pathology (such as infection, tumour or fracture). That is, back pain that occurs often, without an identifiable cause. For example, your back pain may always occur after gardening, but the back pain is not due to a medical problem, such as a tumour or fracture of your vertebrae.

[35] *Neurophysiological* - function of the nervous system.

professionals have reviewed the resource, I will require people who are not professionally involved in the IT, health and education industries to review the material. By taking part in this research you will be assisting me in ensuring that this resource is understandable, and therefore useful to the wider public.

What it will mean for you

I would like to talk to you about [insert information pertinent to their expertise and my curriculum]

The interview will take between 15 minutes and half an hour, either over the phone or at a time and place that is convenient for you. A shorter follow-up interview may be requested. The interviews will be taped and keywords will be drawn from the interview. All features that could identify you will be removed. The voice recordings will be uploaded onto a computer and stored in a password protected file. Only you, the researcher and the project supervisors will have access to any information provided.

If you agree to participate, you will be asked to sign a consent form. If you wish to withdraw any information provided, you may do so in the three weeks following the interview. Due to the time constraints of the project, no information may be withdrawn after this time. If you wish, you may ask to see the Thesis and/or the educational resource before it is submitted for examination. You will not be identified in the Thesis.

Please contact me if you need more information about the project. If you have any concerns regarding the research project you can contact me or my supervisors:

Sarah Dryburgh phone 021 236 2000 or email sarah.dryburgh@gmail.com
Robert Moran, phone 815 4321 ext. 8642 or email rmoran@unitec.ac.nz
Dr. Elizabeth Niven, phone 815 4321 ext. 8320 or email eniven@unitec.ac.nz

UREC REGISTRATION NUMBER: 2009-1019

This study has been approved by the UNITEC Research Ethics Committee from 18 November 2009 to 18 November 2011. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 6162). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

APPENDIX D: CONSENT FORM

 Participant Consent form

A concise, web-based educational resource for non-specific chronic low back pain patients.

PARTICIPANT'S NAME:

DATE:

I have been given and have understood an explanation of this research project by Sarah Dryburgh (researcher). I understand that this project is a requirement for the completion of the Master of Osteopathy programme.

I have had an opportunity to ask questions and have had them answered.

I understand that everything I say is confidential and that none of the information I give will identify me. Neither my name [nor the name of my organisation] will be used in any public reports.

I understand that any discussions with the researcher will be taped and that key words from the interview will be transcribed. I also acknowledge that all the information (both questionnaires and interviews) will be stored securely at for a period of 5 years. I am aware that I can see the finished research document.

I understand that I may withdraw myself or any information up to three weeks after the interview.
I have had time to consider everything and I give my consent to be a part of this project.

I agree to take part in this project.

Signed: _____

Date: _____

UREC REGISTRATION NUMBER: 2009-1019

This study has been approved by the UNITEC Research Ethics Committee from 18 November 2009 to 18 November 2011. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 6162). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.