A Review of Current Therapeutic Practice for the Management of Chronic Pain

Dershnee Devan, BOcc (UKZN), Dip in Hand Therapy (UP)
Lecturer, Department of Occupational Therapy, School of Therapeutic Sciences, University of the Witwatersrand

ABSTRACT

This literature review covers current evidence-based practice in chronic pain management, proposes a model of intervention and examines future directions for clinical practice and research in this field. The literature search was conducted over three databases; Pubmed, OT Seeker and Pedro. Literature published from 2004 to 2013 was included in the search. The majority of the articles reviewed were recent (2008 to 2013) however a few articles and one book prior to these dates were included as they are important studies and reviews that have remained key to the management of chronic pain. The initial search yielded a total of 3221 articles and books. This was systematically narrowed down to 229 relevant articles and books. A total of 25 articles including three books were eventually used to review the current treatment approaches and modalities used in the management of chronic pain by occupational therapists. Modalities reviewed include graded motor imagery, pain education, yoga and the role of an interdisciplinary approach. A review revealed a need for further research in the field of chronic pain rehabilitation.

Keywords: Chronic pain, pain management, therapeutic modalities

INTRODUCTION

Chronic pain is defined as pain that lasts longer than three to six months, or pain that persists beyond the expected time frame of healing for an injury[1]. This review looks at current practice in chronic pain management. The model of "pain as a disease entity" proposed by Siddall and Cousins[2] is reviewed along with the interdisciplinary approach to chronic pain management. Lastly the specific modalities of intervention are examined and future directions for research in this field identified.

METHODOLOGY

A review of the literature was conducted over three databases; Pubmed, OT Seeker and Pedro to establish current pain management practice. The terms used in the search included 'occupational therapy', 'pain management', 'chronic pain' and 'rehabilitation'. The literature published from 2004 to 2013 was included in the search. The majority of articles reviewed were recent (2008 to 2013) however a few articles and one book prior to this were included as they are important studies and reviews that have provided key information on the management of chronic pain. The inclusion criteria covered studies of rehabilitation programmes or modalities used in the conservative and therapeutic management of chronic pain, expert opinion articles, literature reviews, randomised controlled trials and qualitative research. Studies involving children or adolescents with chronic pain, acute pain and medical intervention for chronic pain were excluded. Rehabilitation of chronic pain was used as the main criterion that determined inclusion for this review.

RESULTS

The initial search yielded a total of 3221 articles and books. This was narrowed down to 229 relevant articles and books. A total of 25 references including three books were eventually used to review the current treatment approaches and modalities used in the management of chronic pain by therapists.

Treatment approaches for Chronic Pain

Siddall and Cousins[2] proposed a model where chronic pain was viewed as a disease entity similar to arthritis or a neurological disorder, instead of a symptom of an injury or disease[2]. The implication is that in a condition such as arthritis where one of the symptoms is prolonged and persistent pain, chronic pain, should be acknowledged as a secondary diagnosis. Thus chronic pain has been reported as having its own symptoms, signs and pathology which can be the primary diagnosis[2]. Symptoms such as hyperalgesia, allodynia and paraesthesia present in fibromyalgia or complex regional pain syndrome can be attributed to the disease of chronic pain [2]. Sidall and Cousins[2] argued that chronic pain is a complex disease and there is currently no modality that will 'cure' an individual of chronic pain. These authors maintain that chronic pain sufferers usually react differently to the modalities administered, despite sharing similarities in the initiating or underlying disease process or injury. They argue that chronic pain is not always remediated solely by interventions that target the symptoms or underlying pathology[2]. The management of symptom intensity and achievement of improvement of function for the chronic pain sufferer is the usual goal of pain management i.e. the health care provider may often not be able to 'cure' the individual of the symptoms experienced.

Interdisciplinary Approach

The current model widely accepted as the golden standard for the management of chronic pain is an interdisciplinary approach (previously termed a multidisciplinary approach), as shown by systematic reviews and studies[3-6]. This requires a team of health care professionals with an interest or experience in pain management who work together in a facility to achieve complementary goals and outcomes. Stanos[3] reviewed the interdisciplinary approach and described the involvement of multiple disciplines to achieve a truly biopsychosocial approach with less of a biomedical emphasis. This review included three specific interdisciplinary pain clinics in the United States of America, and covered aspects such as the type of programme run by each institute, outcome measures and duration of the programmes. These programmes generally included individual and group treatment, and therapies ranged from occupational therapy and physiotherapy modalities to psychological interventions. The downfall of the review by Stanos[3] is that it focussed on three specific clinics and did not review current literature which would have included randomised controlled trials and other reviews on the topic. However, Stanos does give more detail regarding the specific structure and organisation of interdisciplinary pain clinics, and this can be used as a good reference by clinicians wanting to set up such a service.

A systematic review by Scascighini et al[4] on interventions and outcomes in multidisciplinary treatment for chronic pain included specific exercises, relaxation therapy, group therapy, patient education, cognitive behavioural therapy, pacing strategies, neurophysiological education and medical training therapy as the proposed minimum standard of multidisciplinary care. The reviewers included 35 randomised controlled studies, however, studies which used techniques such as graded motor imagery (GMI) to target the cortical reorganisation that occurs due to chronic pain[4] were not included. It is reasonable to assume these should have been included as this modality has been shown to play a role in regaining movement and function[7].

Another systematic review on the effectiveness of rehabilitation in the chronic non-specific low back pain population[6] looked at the specific modalities of back school, exercise therapy, transcutaneous electrical nerve stimulation, low level laser therapy, education, massage, behavioural treatment, traction, multidisciplinary treatment, lumbar supports and heat/cold therapy. The review concluded that there was moderate evidence for the use of the multidisciplinary approach with short term effects when compared to no treatment thus these effects may not be sustained on a long term basis. This review carried by van Middelkoop et al[6] was limited to randomised controlled studies published up to December 2008 which makes the research reviewed outdated although the date of publication was later in 2011. The authors did not look at studies including graded motor imagery (GMI), pacing or graded exposure to physical activity which have become prominent in the rehabilitation of chronic pain.

Intervention Modalities used in Chronic Pain

It would not be unreasonable to assume that in order to rehabilitate clients with chronic pain one has to understand the pathophysiology of chronic pain and the psychosocial factors associated with it. However, gaining this basic knowledge seems insufficient, and the acquisition of skills in recent evidence based modalities for pain management would be necessary. This is illustrated well by two of the books written on pain education and GMI reviewed for this article[7,8]. Both books provide a physiological frame of reference and a foundation for the basis of interventions used in chronic pain management. The level of cortical reorganisation that occurs, a better understanding of the role of psychosocial factors, and the context in which the pain occurs could indicate that a change in approach when treating these clients is necessary. This is demonstrated well by Moseley and Flor[9] who examine and substantiate why it is necessary to target the cortex when treating chronic pain. They also illustrate how current treatment modalities such as GMI help to achieve this purpose. The article is a good reference for the neurophysiological background to treatment of chronic pain, and explains these concepts in a simple yet comprehensive fashion. This allows both inexperienced and experienced therapists to learn from the material. The knowledge and skills necessary to administer these modalities or techniques are gained from these research articles and books, attendance of practical workshops and experience in clinical practice. The techniques are fairly simple to implement once therapists are knowledgeable and trained in their use. Moseley et al[7] maintain that to treat pain effectively one must understand the physiological mechanisms underlying chronic pain and the current modalities used. They maintain that it is vital to gain this understanding as it will change all aspects of the clinical interaction one has with the chronic pain client. Following the literature review a number of treatment modalities were selected for closer examination, however one should bear in mind that management of chronic pain is not limited to these modalities. These include neurophysiological pain education, graded motor imagery, graded exposure to physical activity, functional goal setting, yoga, relaxation and mindfulness based interventions.

According to Butler and Moseley[8], pain education is the explanation of the neurophysiological mechanisms underlying the pain, as well as the psychosocial factors affecting the individual. This includes the client's role in the rehabilitation process. This book provides a good overview of the underlying physiology of chronic pain mechanisms, as well as a good format to aid in explaining these processes to a client[8]. The authors maintain that this will help to demystify pain for the client, which immediately serves to decrease the 'threat value' of the pain[8,10].

The evidence that an explanation of pain neurophysiology can significantly decrease pain intensity and improve function is demonstrated by a study done in 2004[10]. This was a blinded, randomised controlled trial which used control and experimental groups comparing neurophysiological pain education to education about back anatomy and physiology. Neurophysiological education proved superior to the education on back anatomy and physiology, and due to the control for bias the results were sound[10]. This study demonstrates that once the underlying physiology or reasons for the symptoms are understood, client participation in rehabilitation improves significantly[10]. A review published in 2011 however reported that according to the Cochrane quality of evidence classification system there is limited evidence for the efficacy of education on pain neurophysiology and more research is required to confirm the results of previous studies[11].

Due to the cortical re-organisation that occurs as a result of chronic pain, treatment modalities that target these changes seem necessary[9]. Such modalities can be thought of as preparatory techniques similar to Rood and Brunnstrom techniques used in neurological rehabilitation. The GMI programme[7,12], pain education[8,10] and, more recently, the use of tactile discrimination[13] have been shown to be effective with chronic pain clients. While these techniques have been researched in a number of studies including randomised controlled studies, the sample sizes have been small and the results have not been replicated in large scale, randomised clinical trials[12-15]. However there are no other modalities currently available to target the cortical reorganisation that occurs with chronic pain[9].

Although most of the research has been done on clients with Complex Regional Pain Syndrome (CRPS) [7,9,12], GMI is a technique that is advocated for all chronic pain clients as the cortical changes that occur are similar according to functional magnetic resonance imaging (FMRI) studies[9]. The areas in the brain involved with sensorimotor processing are affected the most, due to the sensory feedback and decreased physical activity of chronic pain clients. Less activity is equated with less sensorimotor feedback, which results in physiological changes[9].

Moseley's[12] landmark study in 2006 showed significant improvement in participants with CRPS. He outlined three stages of GMI; laterality recognition, motor imagery and mirror therapy.

The laterality recognition targets the client's ability to recognise the affected side of the body. Moseley's basis for including this aspect into the graded motor imagery programme originates from research which shows that clients with chronic pain have less accuracy and speed of recognition in the affected limb[7,12]. Moseley justifies the training of laterality recognition as an activation of the sensorimotor cortex, specifically the pre-motor cortex and the motor homunculus to target cortical changes[7,12].

Moseley's[7,12] second stage is that of motor imagery, which targets the pre-motor cortex and motor cortex. The client is asked to imagine their affected limb at rest, in static postures, performing simple movements and then performing functional movements. Once the client can imagine coordinated pain free movement of the affected limb with no difficulty, Moseley recommends beginning the third phase of graded motor imagery[7,12].

Mirror therapy is often an abstract concept as most clinicians cannot visualise how this technique is performed unless they have experienced it. It involves the use of a mirror or mirror box, which is used to give the visual illusion of the affected limb. The illusion is said to help reconcile sensory input and motor output[7,16]. In the study undertaken by Moseley each of these stages was used for a period of two weeks. During this time the participants had to engage in each phase, hourly and record participation. The results of this[12] study show significant improvement in pain intensity and function of the participants; however these results do not translate well into daily life[14,15]. It would not be unreasonable to assume that most clients are unable to engage hourly in a modality or technique due to work and personal commitments, thus a problem with compliance with the regimen recommended by Moseley may arise. This would result in adaptation of the scheduling of treatment according to the client's schedule and time available. This could then affect the outcome of the interventions proposed as it would not be a direct replication of the methodology proposed by Moseley.

A systematic review of randomised controlled trials on treatment and prevention of CRPS including GMI from 2000 to 2012, found that the randomised controlled trials were limited by small sample sizes and short follow up periods[14]. In addition both of the randomised control trials that used GMI occurred at the same centre, as opposed to different centres in different settings[14]. A

second systematic review and meta analysis published in 2013[15] found that GMI is effective if used in the specific format proposed by Moseley originally and that mirror therapy may be beneficial if used alone. The review noted that the evidence for GMI is limited and further studies are necessary.

Graded activity exposure follows on from GMI and is essentially the exposure to tasks and activities that the individual finds threatening or perceives as impossible to do due to the pain experienced[17]. The concept is similar to that used in treatment of an individual who has a phobia[17]. This modality targets the fear of pain and activity avoidance, both of which have been shown to be disabling in chronic pain clients[17,18]. A review of evidence by Vlaeyen and Linton[19] found that several studies demonstrate a significant improvement in function, fear and catastrophising following graded activity exposure[18]. Randomised controlled trials have shown moderate effect sizes[19]. This could necessitate a cautious approach to this technique as the ideal approach to fear avoidance behaviour that occurs in chronic pain.

Pacing is part of the graded exposure approach and it involves helping clients break down their functional daily activity into manageable parts[19]. The common pattern of behaviour of clients with chronic pain is that they either stop physical activity as soon as pain occurs, or they persist with the activity until it causes severe pain which results in extended periods of inactivity in order to recover (known as the boom bust cycle) explained well by Moseley and Butler[8]. The authors illustrate the concept of helping the client to discover the pace of physical activity that they can cope with on a daily basis[8]. This includes setting specific functional goals in conjunction with the clients. Pacing has been reviewed as a treatment modality and found lacking in terms of specificity and definition[19]. Therapists utilise this technique widely in clinical practice but lack uniformity in its implementation which could result in poor outcomes in treatment[19].

Functional goal setting may achieve increased activity performance, an example of this is Sullivan's[20] progressive goal attainment programme (PGAP). He proposes that the key is to make the initial baseline activity level non-threatening yet physically demanding according to the client's specific physical tolerance and endurance. The Proximal Goal Attainment Programme involves structured goal setting and attainment with a return-to-work focus, deliberately excluding aspects such as pain intensity and symptomatology[20].

Goal setting forms part of self-management, an integral approach recommended recently for pain management[21]. Self-management includes the underlying principles of improved self-efficacy, problem solving, goal setting and a programme that is individually tailored to specific needs[21]. This could have merit in pain management as it is these issues that form the core of an individual's inability to engage in rehabilitation[21]. A 2011 systematic review and meta-analysis recommended self-management as a viable option in pain management as it is cost effective and can be done safely in a community setting[21]. Self-management is proven to work in the arthritis population however the evidence for self-management in the chronic pain population is limited with no proven efficacy[21].

Other modalities used in this field of rehabilitation include relaxation, yoga and mindfulness based interventions[17,22]. Results from a systematic review on mindfulness based interventions concluded that more robust studies are required to prove its effectiveness[21] even though it has shown effectiveness in stress management which plays a role in chronic pain due to the influence of high cortisol levels in stressed states. Relaxation is utilised widely by therapists in various formats[17,22] and a systematic review of studies found positive results for decreased anxiety, depression, fatigue and pain intensity as well as increased mobility[24]. The studies reviewed however were not scientifically robust with respect to study designs, protocols and control groups used[24]. Yoga has been reviewed recently through a systematic review and meta-analysis. It was found to have strong evidence for its efficacy in chronic low back pain in the short term. In the long term however these effects changed to moderate which casts doubt on its efficacy in the long term with this population[25].

Implications

The review revealed a number of modalities available in the field of chronic pain rehabilitation. Their efficacy has not been fully proven and requires further investigation. Large scale randomised controlled trials are need to prove clinical efficacy of these modalities in the long term.

Limitations

This review of therapeutic modalities is limited in that it did not follow the approach of a systematic review. The search was limited to three databases and the articles were selected in a structured manner however this was not done according to systematic review guidelines. A systematic review is recommended to cover all aspects of therapeutic intervention comprehensively in the field of chronic pain management.

CONCLUSION

It is evident from the literature reviewed that chronic pain remains a challenging condition to treat regardless of the precipitating injury or disease. Many of the studies and reviews examined in this review demonstrate low to moderate efficacy which reveals the need to generate further studies on a larger scale, with randomisation and control groups. This will help to establish which modalities are effective in the long term so that the existing gap in evidence based practice can be filled. Blinding in these interventional studies however remains difficult to implement due to the nature of therapeutic intervention and should be noted when evaluating the research in this field.

The nature of chronic pain is multimodal as demonstrated by the review above thus it will require the intervention of an interdisciplinary team with an approach that works to promote holistic functioning of a client on a physical, psychological and social level. It is hoped that this will serve as the future basis for all rehabilitation of chronic pain.

REFERENCES

1. IASP Taxonomy Working Group. Classification of Chronic Pain. 4th Ed. Seattle: IASP Press,2012. http://www.iasppain.org/AM/Template.cfm?Section=Classification_of_Chronic_Pain&Template
2. Sidall PJ, Cousins MJ. Persistent Pain as a Disease entity: Implications for Clinical Management. Anaesthethic Analgesia, 2004; 99: 510-520.
3. Stanos S. Focused Review of Interdisciplinary Pain Rehabilitation Programs for Chronic Pain Management. Current Pain Headache Report, 2012; 16: 147-152.
4. Scasighini L, Toma V, Dober-Spielmann S and Sprott H. Multidisciplinary treatment for chronic pain : a systematic review of interventions and outcomes. Rheumatology, 2008; 47: 670-678.
5. Veizi IE, Chelimsky TC, Janata JW. Chronic Regional Pain Syndrome: What Specialized Rehabilitation Services Do Patients Require? Current Pain Headache Report, 2012; 16: 1 39-146.
6. Van Middelkoop M, Rubinstein S M, Kuijpers T, Verhagen A P, Ostelo R, Koes B W and Van Tulder M W. A systematic review on effectiveness of physical and rehabilitation interventions for chronic non-specific low back pain. European Spine Journal, 2011; 20: 19-39.
7. Moseley GL, Butler DS, Beames TB, Giles TJ. The Graded Motor Imagery Handbook. 1st ed.Adelaide: Noi Group Publications, 2012.
8. Butler DS, Moseley GL. Explain Pain. 1st ed. Sydney:Noi group Publications, 2003.
9. Moseley GL, Flor H. Targeting Cortical Representations in the Treatment of Chronic Pain: A Review. Neurorehabilitation and Neural Repair, 2012; 26 (6): 646-652.
10. Moseley GL. Evidence for a direct between cognitive and physical change during an education intervention in people with chronic low back pain. European Journal of Pain, 2004; 8 (1) 39-45.
11. Clarke C L, Ryan C G and Martin D J. Pain neurophysiology education for the management of individuals with chronic low back pain: A systematic review and meta-analysis. Manual Therapy, 2011; 16: 544-549.
12. Moseley GL. Graded motor imagery for pathologic pain. A randomized controlled trial. Neurology, 2006; 67 (12): 2129-2134.
13. Moseley GL, Wiech K. The effect of tactile discrimination is enhanced when patients watch the reflected image of their unaffected limb during training. Pain, 2009; 144: 314-319.

14. Cossins L, Okell R W, Cameron H, Simpson B, Poole H M and Goebel A. Treatment of complex regional pain syndrome in adults: A systematic review of randomized controlled trials published from June 2000 to February 2012. European Journal of Pain, 2013; 17: 158-173.
15. Bowering K J, O' Connell N E, Tabor A, Catley M J, Leake H B, Moseley G L and Stanton T R. The effects of graded motor imagery and its components on chronic pain: a systematic review and meta-analysis. The Journal of Pain, 2013; 14 (1): 3-13.
16. McCabe CS, Haigh RC, Blake DR. Mirror Visual Feedback for the Treatment of Complex Regional Pain Syndrome (Type1). Current Pain and Headache Reports, 2008; 12 (2): 103-107.
17. Leeuw M, Goosens ME JB, Linton SJ, Combrez G, Boersma K, Vlaeyen JW. The fear avoidance model of musculoskeletal pain : Current state of evidence. Journal of Behavioural Medicine, 2007; 30 (1): 77-94.
18. Vlaeyen J W S and Linton S J. Fear avoidance model of chronic musculoskeletal pain : 12 years on. Pain. (2012), doi:10.1016/j.pain.2011.12.009
19. Gill JR, Brown CA. A structured review of the evidence for pacing as a chronic pain intervention. European Journal of Pain, 2009; 13: 214-216.
20. Sullivan M J, Ward LC, Tripp D, French DJ, Adams H, Stanish WD. Prevention of Work Disability: Community based psychosocial intervention for muscular-skeletal disorders. Journal Occupational Rehabilitation, 2005; 15 (3): 377-392.
21. Du S, Yuan C, Xiao X, Chu J, Qiu Y and Qian H. Self-management programs for chronic musculoskeletal pain conditions: a systematic review and meta-analysis. Patient Education and Counseling, 2011; 85: e299-e310.
22. Flor H, Turk D. Biobehavioral approach to chronic pain. 1st ed. Seattle: IASP Press, 2011.
23. Chiesa A and Serretti A. Mindfulness-based interventions for chronic pain:a systematic review of the evidence. The Journal of Alternative and Complementary Medicine, 2011; 17 (1): 83-93.
24. Persson A L, Veenhuizen H, Zachrison L and Gard G. Relaxation as treatment for chronic musculoskeletal pain – a systematic review of randomized controlled studies. Physical Therapy Reviews, 2008; 13 (5): 355-365.
25. Cramer H, Lauche R, Haller H and Dobos G. A systematic review and meta-analysis of yoga for low back pain, Clinical Journal of Pain., 2013; 29 (5): 450-460.

❑

Corresponding Author
Dershnee Devan
Dershnee.Devan@wits.ac.za

Occupational performance factors perceived to influence the readmission of mental health care users diagnosed with schizophrenia

Rulaine Smith, B.Occ Ther (Pret), Dip Vocational Rehabilitation (Pret)
Lecturer, Dept. of Occupational Therapy, School of Therapeutic Sciences, University of the Witwatersrand

Patricia De Witt, Dip OT (Pret), MSc OT (Wits)
Adjunct Professor and Head, Dept. of Occupational Therapy, School of Therapeutic Sciences, University of the Witwatersrand

Denise Franzsen, BSc OT (Wits), MSc OT (Wits)
Senior lecturer, Dept. of Occupational Therapy, School of Therapeutic Sciences, University of the Witwatersrand

Michelle Pillay**
Nadine Wolfe**
Carrie Davies**
**Students in the Department of Occupational Therapy University of the Witwatersrand at the time the study was carried out

ABSTRACT

Schizophrenia is a complex disorder due to the range of deficits with which mental health care users (MHCUs) present. In addition, the high rate of relapse and readmission in clients diagnosed with schizophrenia complicates the effective management of the condition. Medical factors have been evidenced to affect relapse and readmission rates however limited data exists regarding the influence of occupational performance factors. The aim of this study was therefore, to determine which occupational performance factors are perceived to affect the readmission of MHCUs diagnosed with schizophrenia. A descriptive, cross-sectional quantitative design with qualitative elements was conducted. Card sorting was implemented in two phases to a conveniently sampled population of occupational therapists and MHCUs diagnosed with schizophrenia. Data were analysed by means of descriptive statistics. It was found that social participation was perceived to be the most influential factor in the readmission of MHCUs diagnosed with schizophrenia. In conclusion, both medical and occupational performance factors affect readmission rates of MHCUs diagnosed with schizophrenia. Therefore to implement a client centred approach in occupational therapy, therapists may need to reconsider the priorities they address in treatment.

Keywords: occupational performance, readmission, schizophrenia

INTRODUCTION

The term 'schizophrenia' was coined by Eugene Bleuler in 1911 and is directly translated from Greek origins to mean *skhizein*: "to split" and *phrên*: "mind"[1]. Schizophrenia is viewed as a complex, debilitating disorder where symptoms in affected persons' range from altered cognitive capacity to disrupted social relationships[2].

The prevalence of schizophrenia worldwide appears to be fairly common, as it is rated at 5-5.0 per 10000[1] according to the DSM-IV-TR. The range of symptoms present in mental health care users (MHCUs) diagnosed with schizophrenia is often difficult to manage for various reasons, but it has been said that one of the main difficulties complicating treatment is the high rate of relapse