A Brief Review of Physical and Psychosocial Factors Involved in Chronic Low Back Pain

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Abstract

There is a high incidence of low back pain (LBP) in developed countries. Researchers have investigated potential occupation setting(s) that increase the risk of LBP and have reported numerous job related adaptations to reduce the various identified risks. However, chronic LBP results in approximately 10% of all reported LBP cases which can result in frustrating prolonged disability and extensive financial costs to the healthcare system. In the absence/successful treatment of medical and neurological pathology, biopsychosocial interventions may assist chronic LBP sufferers regain their personal and professional lifestyle. Following the biopsychological intervention model, recent research indicates that following ‘normal’ clinical practice guidelines for LBP and the feedback/recommendations made by healthcare practitioners (physicians’ and therapists’) plays a crucial role in chronic LBP patients treatment and recovery duration.

Keywords: Chronic low back pain; Disability; Management

Introduction

The lifetime prevalence of low back pain (LBP) is greater than 70-90% in industrialised countries [1,2]. Acute LBP is defined as, increased muscle tonus, and stiffness localised below the costal margin and above the inferior gluteal folds, sometimes accompanied by radiating pain, for up to six weeks; subacute LBP definition is used when the pain continues longer than six weeks, but does not exceed 12 weeks; post 12 weeks, the LBP is then classified as chronic LBP [1,2]. Acute LBP seems to be a common condition for which early intervention is required to prevent chronicity [3,4]. Most LBP episodes tend to improve within the first 60 days [5,6], however, 10% of patients experience prolonged pain and disability, and these cases account for 90% of workers’ compensation costs related to LBP [7] as most of these chronic LBP cases cannot be predicted/diagnosed by anatomical or structural changes [8]. Work absence d mostly due to chronic LBP costs billions of dollars worldwide (estimated to be $100 billion per annum in the USA alone) [9] due to decreased/lost productivity, treatment costs, employing and training a second staff member to fill the vacancy, and ongoing compensation payments [10,11].

Low Back Pain Cause(s) and Prevention Strategies

Many occupations require prolonged periods of lifting, standing, and turning. These activities have been associated with increased reports of musculoskeletal disorders, especially LBP, which result in acute and possibly long-term functional detrimental effects. This risk of LBP has prompted the use of mechanical lifts and other devices to assist workers. Hodder et al. [12] and Holmes et al. [13] suggested that posture analysis of the entire working shift with emphasis on all activities related to the respective workers should be examined. As an example, these researchers reported that long-term care health professionals performed patient lifts and transfers for less than 4% of the shift while patient care, unloaded standing and walking as well as miscellaneous tasks, accounted for 85% of the shift. Manual lifts and transfers occurred twice as often as mechanically assisted lifts but took only half the time. While performing manual lifts, the workers had a median trunk flexion angle of 9.2°, spent 25% of their time flexed beyond 30° and had peak flexion angles greater than 75° in many tasks. A study completed by Nelson-Wong et al. [14] at Regis University, Denver, CO and University of Waterloo, Waterloo, ON reported that 40% of the asymptomatic subjects developed LBP during a two-hour standing exposure. Also, while performing a unilateral stance for two-hours, subjects experienced a decrease in vertebral joint rotation stiffness in lateral bending and increased centre of pressure excursion. As suggested by these researchers, it stands to reason there may be adverse effects to prolonged standing if followed by activities requiring precise balance or resistance of side loads [14]. However, the authors did not address possible a relationship between anthropometric (i.e. body weight, waist circumference, etc.) and functional capacity and the onset of LBP. As stated above, most physical impairments attributed to LBP are resolved within the first two months of injury [5,6,15]. Further, researchers have investigated various intervention strategies (anti-fatigue mats, shoe insoles, and more recently, sloped platforms) that seem to alleviate and/or decrease the risk of LBP [16-18]. Recent research has placed greater emphasis on the role of sloped platforms while performing manual lifts and published results suggest: A reduction in perceived low back pain when using sloped platforms is likely not the result of changes in morphology of the trunk musculature, but possibly related to altered kinematics caused by standing on these platforms [16]. A 59.4% decrease in subjective LBP scores when using a sloped surface compared to level standing [17], Subjects preferred to stand further from the load as slope changed from downhill to uphill [18], A downhill slope led to increased torso lean [19], Lower back activity (erector spinae muscle group) was not affected by the sloped platform [18], and No significant movement differences were observed between men and women [18].

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Potential Treatment Options for Chronic Low Back Pain

Various treatment modalities (non-pharmacology/psychological-based, manual therapy, and pharmacology-based) have been used to for chronic LBP sufferers. Recent Cochrane systematic reviews concentrating on psychological interventions reported the following:

- Problem solving therapy (PST) led to partial return to work (RTW) 17 days earlier compared to no treatment or treatment by an occupational physician or general practitioner [20].
- Cognitive behavioural therapy (CBT) or PST does not expedite time and the use of different measurement instruments [15]. An
- Problem solving therapy (PST) led to partial return to work
- Pain intensity, beliefs [28]. Previous experience [29] possible (although
- Cognitive behavioural therapy (CBT) decreased somatic symptoms; however, small effect and
- Only CBT has been adequately studied to allow tentative conclusions [21].
- CBT decreased somatic symptoms; however, small effect and considerable differences in effects were found between CBT effects [21], and
- Compared with enhance/structured (multidisciplinary) care, physiological therapies/CBT were not more effective [21].
- Choachrane and systematic reviews on the effectiveness of manual therapy found:
- No clinically related difference between spinal manipulative therapy (SMT) and other treatments to reduce LBP pain and improve patient function in patients with Chronic LBP [22].
- Based on a small number of available studies meeting the Cocharane review criteria, SMT was found to be no more effective in treating acute low-back pain compared to no intervention, sham SMT, or when combined to another treatment modality [23,24].

Biopsychosocial Factors and the Role of Healthcare Professionals (HCP) Associated with Chronic Back Pain

In the absence or successful treatment of a medical pathology and/or a neurological impairment, researchers have shifted their focus to biopsychosocial interventions in LBP rehabilitation to address concern(s) related to the 10% of patients who experience chronic LBP. The aim of this shift is to prepare chronic LBP sufferers to accept and manage their pain conditions [25] and is based on findings that indicate individuals with negative recovery expectations will remain absent from work two times greater than for those with more positive expectations [15,26-28]; positive patient recovery expectations were associated with a 37% faster suspension of time-loss benefits/return to work [26]. Further, Iles and colleagues [27] reported that recovery expectations measured within three weeks of the onset of low back pain are a strong predictor if that the pain will become chronic. Specifically, negative expectations about recovery were a significant strong predictor of future work absence despite variations in follow-up time and the use of different measurement instruments [15]. An individual's expected recovery time can be influenced by fear, pain, pain intensity, beliefs [28]. Previous experience [29] possible (although not supported by all researchers [30,31] low workplace support and/or a neurological impairment, researchers have developed 'prediction models' based on acute clinical LBP symptoms and psychosocial risk factors, to determine which patients may be at risk of unsuccessful return to work [39].

In the absence of medical pathology or neurological impairment, the 'normal' clinical practice guidelines (CPG) encourage physical activity, despite pain, recommend patients continue with normal daily activities, avoid bed rest and passive treatments, and return to work as soon as possible [40]. Nevertheless, published evidence suggests that HCPs do not always follow these guidelines [41-43] and personal beliefs and attitudes about LBP influence feedback to their patients, regardless of their knowledge of known CPG [44,45].

Past and recent research is also proposing that HCPs’ attitudes and beliefs about back pain may influence the attitudes and beliefs that patients hold about their own LBP [15,46-52]. Further, Domenech et al. [53] and Darlow et al. [47] reported there was a strong correlation between both fear-avoidance and pain-impairment beliefs with the HCPs’ work recommendations, which, strongly supports the hypothesis that beliefs and attitudes are potent modulators of clinical behaviour and may limit adherence to the CPG. These authors also confirmed previous suspicion that a strictly biomedical education/orientation exacerbates maladaptive beliefs and consequently results in recommendations for work and activity levels that differ from those indicated by the evidence [47,48,53]. To assist HCPs, Rainville et al. [46], suggested clinicians enhance their understanding of fear-avoidance beliefs and gain insight into the possible value of CPGs which will assist in decreasing fears and concerns of their patient suffering from LBP. Also, Evans et al. [51], reported that peer-reviewed published education material seems to modify HCPs personal beliefs which led change in practice that followed CPG.

Conclusions

These factors associated with HCP influence may help explain the poor patient adherence to CPG guidelines/recommendations [54]. As such, for patients suffering from LBP, early biomedical diagnosis (elimination of medical pathology and/or neurological impairment) as well as early biopsychosocial interventions may assist patients receive adequate treatment and achieve rapid return to personal and professional wellbeing. Perhaps the key, as stated by Darlow et al. [47], HCPs must be sensitive about the association between their attitudes/ beliefs as their clinical management of their patients with LBP can have a direct influence on these patients.

References


