

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

Neetu Rishiraj*

ACTIN Health and Rehabilitation Inc., 5767 Oak Street, Vancouver, BC, Canada

*Corresponding author: Neetu Rishiraj, ACTIN Health and Rehabilitation Inc., 5767 Oak Street, Vancouver, BC, Canada, Tel: 604-244-3614; E-mail: nrishiraj@actinhealth.com

Rec date: Apr 22, 2015 Acc date: June 3, 2015 Pub date: June 9, 2015

Copyright: © 2015 Rishiraj N. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

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 is 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].

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 Chocrane 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 not no treatment or treatment by an occupational physician or general practitioner [20],
- Cognitive behavioural therapy (CBT) or PST does not expedite RTW full-time compared to receiving no treatment or treatment by an occupational physician or general practitioner [20],
- 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],
- Chocrane 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 low job satisfaction [32]; pain intensity was identified as a strong predictive factor for LBP chronicity (expected recovery time of more than three months) [29,33,34]. These experiences/influences can result in distress, a depressive mood and somatisation which lead to the progression to chronic LBP [35-37]. To assist patients overcome these beliefs, Udermann et al. [38], reported that educating patients may

have important efficacy results in decreasing LBP and reducing the frequency of, or even eliminating their recurrent LBP episodes. These authors found with patients experiencing 10.4 years of chronic LBP that after one-week of being presented with educational material, 51.6% of the chronic LBP sufferers reported noticeable improvements in their pain and related symptoms [38]. At nine-month follow-up, statistically significant and clinical relevant improvements were reported in pain levels, total number of episodes, and perceived benefits; at 18-months follow-up, these chronic LBP sufferers reported and presented with additional progress [38]. In addition, to assist health care professionals (HCP), 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 follows 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

1. Koes BW, van Tulder MW, Thomas S (2006) Diagnosis and treatment of low back pain. *BMJ* 332: 1430-1434.
2. van Tulder M, Koes B, Bombardier C (2002) Low back pain. *Best Pract Res Clin Rheumatol* 16: 761-775.

3. Shaw WS, Pransky G, Fitzgerald TE (2001) Early prognosis for low back disability: intervention strategies for health care providers. *Disabil Rehabil* 23: 815-828.
4. Steffens D, Hancock MJ, Maher CG, Latimer J, Satchell R, et al. (2014) Prognosis of chronic low back pain in patients presenting to a private community-based group exercise program. *Eur Spine J* 23: 113-119.
5. Von Korff M, Saunders K (1996) The course of back pain in primary care. *Spine (Phila Pa 1976)* 21: 2833-2837.
6. Behm DG, Drinkwater EJ, Willardson JM (2010) The use of instability to train the core musculature. *Applied Physiology Nutrition and Metabolism* 35: 91-108.
7. Hashemi L, Webster BS, Clancy EA, Volinn E (1997) Length of disability and cost of workers' compensation low back pain claims. *J Occup Environ Med* 39: 937-945.
8. Carragee E, Alamin T, Cheng I, Franklin T, Hurwitz E (2006) Does minor trauma cause serious low back illness? *Spine (Phila Pa 1976)* 31: 2942-2949.
9. Katz JN (2006) Lumbar disc disorders and low-back pain: socioeconomic factors and consequences. *J Bone Joint Surg Am* 88 Suppl 2: 21-24.
10. Loisel P, Durand M, Berthelette D (2001) Disability prevention: New paradigm for the management of occupational back pain. *Disease Management and Health Outcomes* 9: 351-360.
11. d'Errico A, Viotti S, Baratti A, Mottura B, Barocelli AP, et al. (2013) Low back pain and associated presenteeism among hospital nursing staff. *J Occup Health* 55: 276-283.
12. Hodder JN, Holmes MW, Keir PJ (2010) Continuous assessment of work activities and posture in long-term care nurses. *Ergonomics* 53: 1097-1107.
13. Holmes MW, Hodder JN, Keir PJ (2010) Continuous assessment of low back loads in long-term care nurses. *Ergonomics* 53: 1108-1116.
14. Nelson-Wong E, Howarth SJ, Callaghan JP (2010) Acute biomechanical responses to a prolonged standing exposure in a simulated occupational setting. *Ergonomics* 53: 1117-1128.
15. Hallegraeff JM, Krijnen WP, van der Schans CP, de Greef MH (2012) Expectations about recovery from acute non-specific low back pain predict absence from usual work due to chronic low back pain: a systematic review. *J Physiother* 58: 165-172.
16. Gallagher KM, Wong A, Callaghan JP (2013) Possible mechanisms for the reduction of low back pain associated with standing on a sloped surface. *Gait Posture* 37: 313-318.
17. Nelson-Wong E, Callaghan JP (2010) The impact of a sloped surface on low back pain during prolonged standing work: a biomechanical analysis. *Appl Ergon* 41: 787-795.
18. Reisera RF, Wickelb EE, Menzera HM (2008) Lumbar mechanics of floor to knuckle height lifting on sloped surfaces. *International Journal of Industrial Ergonomics* 38: 47-55.
19. Wickelb EE, Reiser RF 2nd (2008) The effect of floor slope on sub-maximal lifting capacity and technique. *Appl Ergon* 39: 296-304.
20. Arends I, Bruinvels DJ, Rebergen DS, Nieuwenhuijsen K, Madan I, et al. (2012) Interventions to facilitate return to work in adults with adjustment disorders. *Cochrane Database Syst Rev* 12: CD006389.
21. van Dessel N, den Boeft M, van der Wouden JC (2014) Non-pharmacological interventions for somatoform disorders and medically unexplained physical symptoms (MUPS) in adults. *Cochrane Database of Systematic Reviews* 11.
22. Rubinstein SM, van Middelkoop M, Assendelft WJ, de Boer MR, van Tulder MW (2011) Spinal manipulative therapy for chronic low-back pain: an update of a Cochrane review. *Spine (Phila Pa 1976)* 36: E825-846.
23. Rubinstein SM, van Middelkoop M, Assendelft WJ (2012) Spinal manipulative therapy for acute low-back pain. *Cochrane Database of Systematic Reviews* 9.
24. Rubinstein SM, Terwee CB, Assendelft WJ, de Boer MR, van Tulder MW (2013) Spinal manipulative therapy for acute low back pain: an update of the cochrane review. *Spine (Phila Pa 1976)* 38: E158-177.
25. Larsen EL, Nielsen CV, Jensen C (2013) Getting the pain right: how low back pain patients manage and express their pain experiences. *Disabil Rehabil* 35: 819-827.
26. Cole DC, Mondloch MV, Hogg-Johnson S; Early Claimant Cohort Prognostic Modelling Group (2002) Listening to injured workers: how recovery expectations predict outcomes--a prospective study. *CMAJ* 166: 749-754.
27. Iles RA, Davidson M, Taylor NF, O'Halloran P (2009) Systematic review of the ability of recovery expectations to predict outcomes in non-chronic non-specific low back pain. *J Occup Rehabil* 19: 25-40.
28. Boersma K, Linton SJ (2006) Expectancy, fear and pain in the prediction of chronic pain and disability: a prospective analysis. *Eur J Pain* 10: 551-557.
29. Perrot S, Allaert FA, Concas V, Laroche F (2009) "When will I recover?" A national survey on patients' and physicians' expectations concerning the recovery time for acute back pain. *Eur Spine J* 18: 419-429.
30. Hartvigsen J, Lings S, Leboeuf-Yde C (2004) Psychosocial factors at work in relation to low back pain and consequences of low back pain; a systematic, critical review of prospective cohort studies. *Occupational and Environmental Medicine* 61:e2-e11.
31. Verkerk K, Luijsterburg PA, Miedema HS, Pool-Goudzwaard A, Koes BW (2012) Prognostic factors for recovery in chronic nonspecific low back pain: a systematic review. *Phys Ther* 92: 1093-1108.
32. Hoogendoorn WE, van Poppel MN, Bongers PM, Koes BW, Bouter LM (2000) Systematic review of psychosocial factors at work and private life as risk factors for back pain. *Spine (Phila Pa 1976)* 25: 2114-2125.
33. Grotle M, Vøllestad NK, Brox JI (2006) Clinical course and impact of fear-avoidance beliefs in low back pain: prospective cohort study of acute and chronic low back pain: II. *Spine (Phila Pa 1976)* 31: 1038-1046.
34. Heneweer H, Aufdemkampe G, van Tulder MW, Kiers H, Stappaerts KH, et al. (2007) Psychosocial variables in patients with (sub)acute low back pain: an inception cohort in primary care physical therapy in The Netherlands. *Spine (Phila Pa 1976)* 32: 586-592.
35. Pincus T, Burton AK, Vogel S, Field AP (2002) A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain. *Spine (Phila Pa 1976)* 27: E109-120.
36. Carragee EJ, Alamin TF, Miller JL, Carragee JM (2005) Discographic, MRI and psychosocial determinants of low back pain disability and remission: a prospective study in subjects with benign persistent back pain. *Spine J* 5: 24-35.
37. Jarvik JG, Hollingworth W, Heagerty PJ, Haynor DR, Boyko EJ, et al. (2005) Three-year incidence of low back pain in an initially asymptomatic cohort: clinical and imaging risk factors. *Spine (Phila Pa 1976)* 30: 1541-1548.
38. Udermann BE, Spratt KF, Donelson RG, Mayer J, Graves JE, et al. (2004) Can a patient educational book change behaviour and reduce pain in chronic low back pain patients? *Spine J* 4: 425-435.
39. Jensen OK, Stengaard-Pedersen K, Jensen C, Nielsen CV (2013) Prediction model for unsuccessful return to work after hospital-based intervention in low back pain patients. *BMC Musculoskelet Disord* 14: 140.
40. Arnau JM, Vallano A, Lopez A, Pellisé F, Delgado MJ, et al. (2006) A critical review of guidelines for low back pain treatment. *Eur Spine J* 15: 543-553.
41. González-Urzelai V, Palacio-Elua L, López-de-Munain J (2003) Routine primary care management of acute low back pain: adherence to clinical guidelines. *Eur Spine J* 12: 589-594.
42. Francke AL, Smit MC, de Veer AJ, Mistiaen P (2008) Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review. *BMC Med Inform Decis Mak* 8: 38.
43. Bishop A, Foster NE (2005) Do physical therapists in the United kingdom recognize psychosocial factors in patients with acute low back pain? *Spine (Phila Pa 1976)* 30: 1316-1322.
44. Houben RM, Vlaeyen JW, Peters M, Ostelo RW, Wolters PM, et al. (2004) Health care providers' attitudes and beliefs towards common low

-
- back pain: factor structure and psychometric properties of the HC-PAIRS. *Clin J Pain* 20: 37-44.
45. Côté AM, Durand MJ, Tousignant M, Poitras S (2009) Physiotherapists and use of low back pain guidelines: a qualitative study of the barriers and facilitators. *J Occup Rehabil* 19: 94-105.
46. Rainville J, Smeets RJ, Bendix T, Tveito TH, Poiraudéau S, et al. (2011) Fear-avoidance beliefs and pain avoidance in low back pain--translating research into clinical practice. *Spine J* 11: 895-903.
47. Darlow B, Fullen BM, Dean S, Hurley DA, Baxter GD, et al. (2012) The association between health care professional attitudes and beliefs and the attitudes and beliefs, clinical management, and outcomes of patients with low back pain: a systematic review. *Eur J Pain* 16: 3-17.
48. French SD, McKenzie JE, O'Connor DA (2013) Evaluation of a Theory-Informed Implementation Intervention for the Management of Acute Low Back Pain in General Medical Practice: The IMPLEMENT Cluster Randomised Trial. *PLoS One* 8:e65471.
49. Poiraudéau S, Rannou F, Baron G, Le Henanff A, Coudeyre E, et al. (2006) Fear-avoidance beliefs about back pain in patients with subacute low back pain. *Pain* 124: 305-311.
50. Campbell P, Foster NE, Thomas E, Dunn KM (2013) Prognostic indicators of low back pain in primary care: five-year prospective study. *J Pain* 14: 873-883.
51. Evans DW, AC Breen, Pincus T (2010) The effectiveness of a posted information package on the beliefs and behaviour of musculoskeletal practitioners: The UK Chiropractors, Osteopaths, and Musculoskeletal Physiotherapists Low Back Pain Management (COMPLeMENT) randomized trial. *Spine* 35: 858-866.
52. Fullen BM, Baxter GD, O'Donovan BG, Doody C, Daly LE, et al. (2009) Factors impacting on doctors' management of acute low back pain: a systematic review. *Eur J Pain* 13: 908-914.
53. Domenech J, Sánchez-Zuriaga D, Segura-Ortí E, Espejo-Tort B, Lisón JF (2011) Impact of biomedical and biopsychosocial training sessions on the attitudes, beliefs, and recommendations of health care providers about low back pain: a randomised clinical trial. *Pain* 152: 2557-2563.
54. Vlaeyen JW, Linton SJ (2006) Are we "fear-avoidant"? *Pain* 124: 240-241.