

# THE EFFECT OF OCCUPATIONAL-RELATED LOW BACK PAIN ON THE FUNCTIONAL ACTIVITIES AMONG MANUAL WORKERS IN CONSTRUCTION COMPANIES.

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## Abstract

### Introduction:

Low back pain is the most prevalent musculoskeletal condition and one of the most common causes of disability in the world. The disability resulting from low back pain continues to plague the construction industry leading to absenteeism and early retirement among construction manual workers.

### Purpose:

The aim of the review was to explore global literature concerning the effect of occupational-related low back pain on the functional activities among manual workers in construction companies.

### Method:

A retrospective search of articles published from January 2000 to April 2010. The following electronic data bases, Google Scholar, Academic search premier, CINAHL, ERIC, Health source-consumer Edition, Health source: Nursing/Academic Edition, Master FILE Premier, MEDLINE, MLA Directory of Periodicals, Science direct, MLA International Bibliography, Pre-CiNAHL and PubMed were individually searched using specifically developed search strategies. Methodological quality was evaluated using the Critical Appraisal Skills Programme (CASP) tool and was done by two independent reviewers.

### Results:

The search yielded eleven articles of sound quality. There is evidence that a high percentage of construction workers suffer permanent disability and fail to return to work forcing them to go into early retirement due to occupational related low back pain. The cohort studies have shown that poor performance, reduction in productivity, restrictions on usual activity and participation and incurring high medical costs all pose a challenge to construction manual workers and their employers as a result of occupational related low back.

### Conclusion:

The findings support that occupational related low back pain is a challenge among construction manual workers causing serious disability. Further well designed research in Africa into the most effective strategies to prevent and manage occupational related low back pain among construction manual workers is needed.

### Key words:

Occupational related low back pain, Construction manual workers, Function, Disability, Impairment, Activity limitation, Participation restriction.

## INTRODUCTION

Low back pain is a highly prevalent and costly somatic complaint accounting for a large percentage of all sickness absence in the world

(Latza, Pfahlberg & Gefeller, 2002; Gheldof, Vinck, Vlaeyen, Hidding & Crombez, 2007). It has been found to be more common amongst construction manual workers compared to all occupational

groups (Deacon, Smallwood, & Haupt, 2005). The consequences of low back pain among workers mainly lead to sick leave and disability pension often resulting in limitations in activity and restriction in participation (Bautz-Holter, Sveen, Cieza, Geyth, & Roy, 2008).

Low back pain is highest in construction manual workers compared to all occupational groups (Deacon, Smallwood & Haupt, 2005). Due to the high mechanical nature and hard physical labour, construction work has a reputation of being an unhealthy industry. Heavy manual handling twisting and trunk rotation and maintenance of static and awkward body postures for long hours are typical positions adopted by construction manual workers. These activities exert a lot of strain on spinal structures and consequently lead to low back pain. (Latza, Pfahlberg & Gefeller, 2002). According to Gallagher (2008), construction manual workers may suffer from low back pain but do not report it as an injury. Nonetheless, such “non-reported” pain may result in decreased productivity and quality of life (Gallagher, 2008). Childs, Fritz, Flynn, Irgang, Johnson, Majkowski and Delitto (2004) highlighted that billions of dollars in societal and medical expenditures are lost each year because of low back pain in construction.

In addition to economic loss, Katz (2006) indicates that low back pain may result in significant levels of disability, producing restrictions on usual activity and participation, such as inability to work normally (especially in construction work). According to Punnett, Pruss-Ustun, Nelson, Fingerhut, Leigh, Tak and Phillips (2005), occupational related low back pain has enormous effects on an individual's functional ability leading to absenteeism from work and loss of one's quality of life. It has been noted that individuals with low back pain (in construction companies) tend to have negative attitudes towards strenuous activities and leisure pursuits based on fear avoidance beliefs (Woolf & Pfleger, 2003). Anxiety, stress, depression, somatisation symptoms, stressful responsibility, job dissatisfaction, mental stress at work, negative body image, weakness in ego functioning, poor drive satisfaction and substance abuse were among the highlighted psychosocial factors associated with occupational related low back pain (Andersson, 1999). Though low back pain is a big

problem among construction manual workers, very little has been published about its effect on the functional activities of the manual workers in construction companies especially on the African continent. This was identified by the researcher as a gap that needs to be explored and thus the aim of this review is to determine the effect of occupational-related low back pain on the functional activities of the manual workers in construction companies.

## **METHODS**

A comprehensive search for literature related to the topic was done from January 2000 to April 2010 in all the University of the Western Cape (UWC) library accessible databases.

The search considered any full text peer reviewed research studies around the world relevant to the topic. The PICO (Population, Intervention, Comparison and Outcomes) was used as the searchable format for the clinical question and to review the articles and the abstracts. All identified literature was screened using the Sackett's level of evidence hierarchy system and to determine the eligibility of the paper for inclusion in the study (Sackett, 1989). Only literature published in the English language from 2000 to 2010 was considered. The final screening of all the identified literature was done by two independent reviewers.

The databases searched included: Google Scholar, Academic search premier, CINAHL, ERIC, Health source-consumer Edition, Health source: Nursing/Academic Edition, Master FILE Premier, MEDLINE, MLA Directory of Periodicals, Science direct, MLA International Bibliography, Pre-CiNAHL and PubMed. The main key terms used for searching for the literature were: Construction manual workers, Low back pain and Functional limitations.

In Medline and Science direct, “and” was used as a Boolean operator. Other databases did not produce any results except the ones given in Table 1.

## **Search results**

The search generated a total of 6 185 articles of which twelve were found relevant to this topic. A total of 6 173 articles were excluded because they did not conform to the objectives and inclusion criteria of this review. Details of the search results are illustrated in table 1.

**Table 1: Search results**

Database	Hits	Retained	Excluded	Included
Science direct	5	4	1	4
Google scholar	6176	4	6173	3
Medline	3	3	3	0
Pubmed	1	1	1	0

**Assessment of methodological quality**

After selection of the twelve studies presumed to be of acceptable designs, the Critical Appraisal Skills Programme (CASP) tool for cohort studies (CASP, 2006) was used to assess methodological quality of the cohort, cross-sectional and longitudinal studies. CASP for cohort studies uses an instrument to appraise reviews based on 12 questions (Milne & Chambers, 1995). These questions address key domains (e.g. comprehensive search, validity assessment, results combination) of methodological quality (CASP, 2006). Therefore, all articles included in this study were evaluated for quality and each study was classified as good if it scored

between (8-12/12), moderate (5-7/12) and poor (1-4/12). The only systematic review included was evaluated for quality using the (CASP) tool for systematic reviews (Oxman, Cook & Guyatt, 1994). This tool comprises of 10 questions thus having scores ranging from 1-10. The scores are classified as good if an article scores between (8-10/10), moderate (5-7/10) and poor (1-4/10). Of the twelve retained articles, seven had a good methodological quality and were therefore included for review (Table 2). Five articles scored between 1- 4 and were excluded because they were considered to be of poor quality.

**Table 2: Methodological quality scores of included studies**

Title	Authors	CASP Score of Methodological quality
Good management practice as means of preventing back disorders in the construction sector.	Gervais, M. (2003).	8/10
The health and well-being of older construction workers.	Deacon, C. T., Smallwood, J. & Haupt, T. (2005).	10/12
Health problems lead to considerable productivity loss at work among workers with high load jobs.	Meerding, W. J., Ijzelenberg, W., Koopmanschap, M. A., Severens, J. L. & Burdorf, A. (2005).	10/12
Demonstration of the healthy worker survivor effect in a cohort of workers in the construction industry.	Siebert, U., Rothenbacher, D., Daniel, U. & Brenner, H. (2001).	9/12
Cohort study of occupational risk factors of low back pain in construction workers.	Latza, U., Karmaus, W., Sturmer, T., Steiner, M., Neth, A. & Rehder, U. (2000).	10/12
Development of and recovery from short- and long- term low back pain in occupational settings: A prospective cohort study.	Gheldof, L. M, Vinck, J., Vlaeyen, J. W. S., Hidding, A. & Crombez, G. (2007).	10/12
Impact of repetitive manual materials handling & psychological work factors on the future prevalence of chronic low- back pain among construction workers.	Latza, U., Pfahlberg, A. & Gefeller, O. (2002).	9/12

## RESULTS

The seven studies included in the review comprised of one systematic review, one longitudinal study, two cross-sectional and three cohort studies. Of the included articles, most of the studies were conducted in developed countries with only one study conducted in South Africa. Various methods were used for data collection. Among the methods used for data collection were questionnaires (Meerding, Ijzelenberg, Koopmanschap, Severens & Burdorf, 2005; Gheldof, Vinck, Vlaeyen, Hidding & Crombez 2007) medical examinations only (Siebert et al., 2001; Latza, Pfahlberg, & Gefeller, 2002), medical examinations and an interview (Deacon, Smallwood, & Haupt, 2005; Latza et al., 2000) and a systematic review used screening as the criteria of including literature (Gervais, 2003). The sample participants of the studies ranged from 142 to 1 809 participants with the age group ranging from 15 years to 65 years and the sample mean age of 40 years. A summary of the studies included in this review is illustrated in Table 3.

## DISCUSSION

The aim of the review was to determine the effect of occupational-related low back pain on the functional activities of the manual workers in construction companies. Firstly, the prevalence of occupational related low back pain was high as is shown by literature (MacIntoshi & Hall, 2008). Two cohort studies by Latza et al. (2000) and Latza et al. (2002) have shown that among all occupational groups, construction manual workers are the worst affected by low back pain due to the nature of the activities they perform while on duty. Gheldof et al. (2007) highlighted in their prospective cohort study that construction manual workers are more exposed to back disorders due to manipulation of heavy loads, heavy lifting that exceeds the lifting tolerance, forceful exertions and maintenance of awkward postures for long hours such as bent or twisted back. As a result of these risk factor exposures, low back pain has consistently been the leading cause of occupational disability and absenteeism in the construction industry (Gheldof et al., 2007).

In the included systematic review, Gervais (2003) uncovered that there was a high percentage of construction workers suffering permanent disability and failure of returning to work due to occupational

related low back pain. Furthermore, the two cross-sectional studies uncovered that construction activities exacerbate low back pain in construction workers and these activities lead to restrictions in daily activities such as standing, walking, bending, lifting, travelling to work, socialising and interference with personal care (Meerding et al., 2005; Deacon et al., 2005). Construction activities are highly associated with absenteeism, poor performance and consequently reduced production (Meerding et al., 2005), with the effects being worse among older construction manual workers (Deacon et al., 2005). The number of day's lost due to sick leave and the costs incurred on the rehabilitation of low back pain have imposed socio-economic challenges among construction workers and the employers (Pinto, Cleland, Palmer & Eberhar, 2007). Germany recorded a total of 11 138 (15%) construction workers claiming compensation from insurance funds in 1999, out of 42 million employees in the industrial sector due to occupational disorders with low back pain being the most prevalent disorder (Latza et al., 2002). In the United Kingdom, lost productivity and resulting economic costs, due to low back pain were estimated to be in the region of 12 billion pounds in 1998 (Van Vuuren, Van Heerden, Zinzen, Becker & Meeusen, 2006). One cohort study established that back and spine disorders among construction manual workers lead to about 63% of the workers retiring early and about 43% suffering permanent disability (Siebert et al., 2001).

## CONCLUSION

The results of this review indicate that there is reason for concern regarding occupational related low back pain among construction manual workers worldwide. High quality interventions should be undertaken by health professionals and employers to ensure better support for workers suffering from low back pain and therefore enhance primary prevention of back disorders in the construction companies. The findings of this review also indicate that primary prevention should be considered a priority in the management of occupational related low back pain among construction manual workers to prevent psychosocial disorders, absenteeism, early retirement, reduced production, and permanent disability and constraining of economic resources for the worker and the company due to the ever increasing health care expenses. In Africa,

**Table 3 Summary of description of reviewed studies**

Reference	Design	Country	Population	Tool	Objective	Outcome
Gervais (2003).	Systematic review	Canada	Review of 40 studies	Independent screening (tool not mentioned)	To develop a basis for new intervention strategies for back disorders in the construction sector.	Primary prevention of back disorders can be done by administrative and engineering controls.
Deacon, Smallwood, & Haupt (2005).	Cross sectional	South Africa	142	Interview & medical exam	To investigate the health status of older construction workers.	Construction activities exacerbated low back pain in older construction workers & were highly associated with absenteeism & poor performance.
Meerding, Ijzelenberg, Koopmanschap, Severens, Burdurf (2005).	Cross sectional	Netherlands	182	Questionnaire (self administered)	To assess the feasibility of two instruments for the measurement of health-related productivity loss at work.	High physical load jobs in construction have considerable reduced work productivity & sickness absenteeism.
Siebert, Rothenbacher, Daniel, & Brenner, (2001).	Cohort	Germany	10 809	Medical exam	To assess the potential of a healthy worker survivor effect due to differential occupational mobility in a cohort of construction workers.	Back & spine disorders led to permanent disability hence early retirement & mortality when associated with other health conditions e.g. diabetes.
Latza, Karmaus, Sturmer, Steiner, Neth, & Rehder (2000).	Cohort	Germany	571	Structured interview & medical exam	To identify work related risk factors of future low back in a cohort of construction workers free of low back pain at the start of follow up.	Differences in work characteristics, average working hours per shift & psychosocial factors (job satisfaction) can predict the future prevalence of low back pain.
Gheldof, L. M., Vinck, J., Vlaeyen, J. W. S., Hidding, A. & Crombez, G. (2007).	Prospective Cohort	Netherlands	1 294	Questionnaire (Self administered)	To investigate the role of work-related physical factors and psychological variables in predicting the development of and recovery from short term to long term low back pain.	High fear –avoidance beliefs (re)injury regarding construction work increased the failure from recovery from acute to chronic low back pain.
Latza, U., Pfahlberg, A. & Gefeller, O. (2002).	Longitudinal study	Germany	488	Medical exam	To investigate the influence of manual stone & brick handling & psychosocial work factors on the risk of chronic low-back pain & to describe the impact in terms of risk advancement period.	Repetitive work in bent positions & manual manipulation of heavy stones increases the risk of low back pain in construction.

there is still a dearth in research and information on back disorders among construction workers suffered on duty. Therefore, more studies of sound methodological quality exploring this area need to be done.

### IMPLICATIONS FOR PRACTICE

Occupational related low back pain is a challenge among construction manual workers causing serious disability. It is therefore imperative that primary preventive measures are put in place at epidemiological level and require implementation by the employer, health professionals and construction manual workers. This will improve on the socio-economic challenges of the manual workers and reduce on their impairments, limitations in activity and restrictions in participation they suffer due to occupational related low back pain.

The Physiotherapist's physiological understanding, the assessment, and the treatment skills results in a professional with the knowledge to direct an efficient preventative program (Jones & Kumar, 2001). Physiotherapists must embark on work place disability management programs in their clinics when treating construction manual workers suffering from occupational related low back pain. The physiotherapist's role must include prevention, early assessment, proactive treatment, timely rehabilitation and early return to work in the hope to prevent psychosocial disorders, absenteeism, early retirement, permanent disability, reduced production and minimizing the cost of the low back problem.

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