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The effect of occupationally-related low back pain on functional activities among male manual workers in a construction company in Cape Town, South Africa

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ABSTRACT

***Background*:** This study determined the prevalence as well as the effect of occupationally-related low back pain on the functional activities of workers in a construction company in Cape Town. A cross-sectional, descriptive survey using a validated questionnaire was carried out. The questionnaire comprising demographic data, low back pain symptoms information, functional limitations scale and the participation restriction scale was used as a closed ended interview guide. Workers suffered physical, emotional, financial and functional problems with 41.5% reporting sickness absence. Lifting and bending were the most affected activities associated to low back pain ($p<0.05$) while walking/running, recreational activities and carrying out of everyday tasks were among the restricted activities. The one year prevalence of low back pain was 25%, comparable with that of developed countries. Occupationally-related low back pain is a challenge among construction workers which they perceive to cause serious functional activity limitation. All stakeholders must be procured for the prevention and management of occupationally-related low back pain in order to prevent functional activity limitations among construction workers. Physiotherapists should raise the levels of awareness and monitor construction activities on site in order to prevent disability at primary level.

Key words: Low back pain, occupationally-related, construction manual workers, disability

INTRODUCTION

Occupationally-related low back pain (LBP) is the most common musculoskeletal disorder and one of the leading causes of occupational injury and disability in both developed and developing countries.1,2 In Africa, the LBP prevalence is relatively high though the lack of knowledge about the LBP prevalence is still significant.2 In South Africa, LBP point prevalence rate among steel plant workers was found to be 35.8%, with the lifetime prevalence rate being 63.9%3 Among South African manganese workers, the lifetime and annual prevalence of low back pain was reported to be 71.6% and 69.8% respectively, with month and point prevalence being 55.0% and 37.6% respectively.84 Although LBP cuts across gender, race and occupational environment, it appears to be present in certain professions more than others.4 However, it also appears to be more common among construction manual workers compared to all occupational groups5 due to the nomadic, high mechanical nature, awkward postures for long hours and hard physical labour of construction work.6 The activities involved in construction work exert a lot of strain on spinal structures and consequently lead to LBP.7 Despite the evidence that LBP is common among construction workers, there is a dearth of empirical studies and information reported on the prevalence among construction workers in Africa.

Occupationally-related LBP was found to have an enormous effect on the economy.8 Considerable research efforts have been devoted to determining potential risk factors in order to identify possible preventive measures at primary level that would in turn reduce the burden of the problem. In South Africa, it was calculated that about 30 000 persons suffer daily from back problems and 10% of them will become functionally disabled with the compensation cost of approximately $20 million.8 In addition to economic loss, LBP may result in significant levels of disability, producing restrictions on usual activity and participation, such as the inability to work normally (especially in construction work).9 With respect to LBP, the International Classification of Function, Disability and Health (ICF) defined functional limitations as activity limitations experienced because of the LBP problems while

activity limitation is the level of difficulty that an individual has in executing an activity due to LBP.10 Its classification is a more comprehensive bio-psycho-social description that can be used to cover all health problems including LBP maladies.11,12 According to Punnett et al. occupationally- related LBP has enormous effects on an individual's functional ability leading to absenteeism from work and loss of one's quality of life.6 Various psychosocial factors (anxiety, depression, job dissatisfaction, stress, etc.) associated with occupationally-related LBP have been highlighted.13 The main consequences of work-related LBP among workers are increased sick leave and disability pension.14 With LBP being 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. Some authors have suggested that the scarcity of reports from developing countries may be due to the fact that LBP effects and interventions pale in compari¬son with other health problems like HIV/AIDS and therefore hardly seems worth mentioning.15,16 This was identified by the researcher as a gap that needs to be explored. The results of the

study may be a challenge to health professionals especially physiotherapists for future strategic approaches in primary and secondary prevention of occupational related low back pain among construction manual workers. It will also add value to the scanty literature available.

The aim of this study was to determine the prevalence and effect of occupationally-related LBP on the functional activities of the manual workers in a construction company in Cape Town. In addition, the study determined the self-perceived causes of LBP and the related impact.

METHOD

A cross-sectional quantitative survey was conducted at two construction sites in Cape Town, South Africa. The construction company involved in the two construction settings and conveniently selected for the study is among Africa's top construction companies. It is a multi-disciplinary construction and engineering group, anchored in South Africa and focused on selected infrastructure, energy and mining opportunities in Africa.17 At the identified sites, 212 construction manual workers were employed. All of them were selected and recruited to participate in the study. For the purposes of this study a construction manual worker was defined as a general/blue collar worker employed in the construction industry, who works predominantly on construction sites and is typically engaged in hands-on aspects of the industry other than design or finance.18 For the study, all the male construction manual workers with at least three months working experience constructing were included.

Data was collected by the researcher (SH) using a questionnaire as a closed ended interview guide. The questionnaire, consisting of a demographic section and three reliable tools, was utilised as a closed ended interview guide. The tools were the Nordic Musculoskeletal Disorder Questionnaire19 for musculoskeletal symptom data (Kappa values ranging from 0.88 to 1), the functional limitations scale from the Profile Fitness Mapping questionnaire10 (Cronbach's alpha of between 0.90 to 0.95),9 and the Pain and Disability Questionnaire to determine participation restriction (test- retest reliability coefficients ranging from 0.94 to 0.98).20 The Pain and Disability Questionnaire uses a scale ranging from 0 (no effect) to 10 (severe effects) to determine the levels/severity of restriction in participation. Activities with a mode of more than five were regarded as having severe restrictions.

The main purpose of the functional limitation scale of the profile fitness mapping questionnaire was to assess how back problems affected the construction manual workers capability to perform an activity of daily life.10 Twenty-seven elementary activities formed the basis for the functional limitation scale of the profile fitness mapping questionnaire. All items of the profile fitness mapping questionnaire have six response alternatives (ranging from 1 = very good, 2 = good, 3 = rather good, 4 = rather bad, 5 = bad to 6 = very bad. Higher index scores reflect better function/better health. The result of each index is expressed as the percentage of the maximum score, where 100% is the best possible result.

Ethical approval was obtained from the Research Ethics Committee at the University of the Western Cape (10/1/13), permission to conduct the study from the construction company, and written informed consent from all participants. Interviews were conducted at the construction site in a quiet area.

Data was analysed using Statistical Package for Social Sciences (SPSS). The Chi-square test and Chi-square test for proportion were used as inferential statistical analyses to determine relationships between demographic variables of the respondents and the prevalence of LBP, and to determine the association between LBP and its effect on the functional activities of the respondents respectively. Descriptive statistics using the mode and mean were used to determine the extent of restriction in participation as a result of LBP among the participants. The Chi-square test was used to compare sub-groups of various work settings at a $p<0.05$ level of significance

RESULTS

All 212 participants participated thus yielding a 100% response rate. The age of the participants ranged between 17 and 65 years with a mean age of 31.9 years (SD = 10.7 years). The majority of the sample were masons (46%), with handymen and labourers both accounting for 25% of the population while foremen were the minority (4%).

The one year, one month and one week prevalence of LBP were 25% (n = 54), 69% (n = 37) and 54% (n = 29) respectively. Of the participants, 94% attributed the initial onset of their LBP problem to construction work activities.

Participants mostly worked in standing, bending, sitting, stooping and kneeling postures. Participants that mostly worked in the bend posture reported to be the most affected with LBP (64.8%) followed those that worked in the standing posture (24.1%). The number of days taken off work ranged from one to fourteen days with an average of four days of absenteeism during the past year confirmed by the participants. Masons recorded the highest percentage

(54.5%) of absenteeism followed by handymen (31.8%). A summary of the activities perceived to be leading to low back pain are shown in Table 1.

Participants who suffered from occupationally-related LBP also reported other associated symptoms that are highlighted in Table 2. The majority of the participants experienced emotional problems with high levels of anxiety, irritability and short temperedness as a result of suffering from occupational low back pain.

Significant associations were found between LBP and functional abilities of the participants (Table 3).

The levels of restriction in participation as a result of LBP are given in Table 4.

DISCUSSION

The aim of this study was to determine the prevalence and effect of occupationally-related LBP on the functional activities of the manual workers in a construction company in Cape Town, South Africa. These data characterise only one population, and may not be representative of the situation occurring in other parts of Africa with a less income compared to South Africa. However, the current study reported a higher one week and one month LBP prevalence than reported in previous studies among Iranian industrial workers and Danish semiskilled construction workers,[21,22] with an annual prevalence of LBP (in this study) within the range of other studies.[1,21] The disparity could be attributed to the sampling, sampling technique, time of study and the actual questions.[13] It was found that awkward, prolonged working postures and daily lifting and manipulation of heavy objects were perceived causes of LBP among the workers. Sustained postures were the most important job-risk factors leading to occupationally- related LBP among construction manual workers. This is in accordance with previous literature.[6,23]

LBP has consistently been the leading cause of occupational disability and absenteeism in the construction industry.[24] The high prevalence of LBP resulted in a high absenteeism rate (42%) in the current study compared to other studies of 5% and 26%.[2125] Guo et al. highlighted that 18 percent of workers lost an estimated 149 million days of work due to LBP annually.[25] Absenteeism due to disability leads to poor performance of functional activities, restriction in participation and reduced production.[24]

LBP also impacted on the psychological and functional status of the participants. The workers confirmed suffering irritability and short-temperedness, anxiety and becoming moody as a result of LBP for more than half of their time at work. This has previously been highlighted by other researchers.[26] Participants also reported that their daily functional activities were limited substantially. The inability to perform such simple activities is likely to have a detrimental effect on one's quality of life. Literature has highlighted that the presence and intensity of pain is a poor health outcome on its own[27] and correlates poorly with measures of physical functioning.[28] It has been suggested that fear of movement may cause LBP sufferers to avoid activities requiring physical effort.[29] Loss of independence among the workers with LBP was also experienced and this can lead to isolation and emotional consequences due to feelings of helplessness as a result of limitations.[30] The present study revealed that the workers engaged less in sedentary leisure and hobby activities due to LBP and literature has highlighted that lack of leisure pursuits could consist of both physical and psychological barriers and that the reduction or cessation of leisure activities may also reduce opportunities for social interactions and may lead to social isolation.[30]

CONCLUSION AND RECOMMENDATIONS

Occupationally-related LBP is a serious concern among construction manual workers, and the rise in prevalence rates in Africa indicates the need for urgent attention. This study found that occupational activities in the construction industry were the perceived causes of LBP, consequently leading to absenteeism, activity limitations and participation restrictions. It is therefore imperative that primary preventive measures are put in place at epidemiological level and these require joint implementation by the employer, health professionals and construction manual workers. This should 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 occupationally-related LBP

IMPLICATIONS FOR PRACTICE

The physiotherapist's physiological understanding, the assessment, and the treatment skills results in a professional with the knowledge to direct an efficient preventative programme. Physiotherapists should be present at construction sites to raise the levels of awareness and monitor construction activities in order to prevent disability at primary level. Physiotherapists should also embark on workplace disability management programmes in their clinics when treating construction manual workers suffering from occupationally- related LBP. Approaching the problem in a biopsychosocial manner will enable the best possible prevention strategy. 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, permanent disability, reduced production and minimizing the cost of the low back problem.

LIMITATIONS OF THE STUDY

This study was a cross-sectional design using convenient sampling and had a small sample size. Though the study used two different settings, the results cannot be generalised to the entire construction industry in South Africa. However, the information generated can be helpful as a baseline for prevention interventions.

LESSONS LEARNED

1. The prevalence of LBP among construction workers in Africa may be comparable to that reported in research undertaken in developed countries.
2. Low back pain has detrimental effects on socioeconomic economic activities of the manual workers and leads to serious impairments, limitations in activity and restrictions in participation.
3. Physiotherapists should be present at construction sites to raise the levels of awareness and monitor construction activities in order to prevent disability at primary level.
4. Health practitioners and construction stakeholders should embark on workplace disability management programmes in their clinics when treating construction workers and promote a good working environment in order to reduce absenteeism and loss of production.

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Pull quotes

1. ". . . it . . . appears to be more common among construction manual workers . . . due to the nomadic, high mechanical nature, awkward postures for long hours and hard physical labour of construction work."

2. "The activities involved in construction work exert a lot of strain on spinal structures and consequently lead to LBP."
3. "The one year, one month and one week prevalence of LBP were 25% . . . , 69% . . . and 54% respectively."

Table 2. Other reported symptoms associated with low back pain among participants

	Symptom	Percent
Physical problems	Limping when walking	28.3%
	Disturbance of balance	24.5%
	Difficulty with urination	22%
	Difficulty with emptying bowel	18.9%
	Stomach problems	18.9%
Emotional problems	Irritable and short tempered	56.6%
	Anxiety	67.9%
	Irrational mood swings	58.5%
Functional problems	Pain during activity	87.7%
	Pain at rest	54.7%
	Sleep problems	58.5%
	Decreased sex life	32.1%

4. "Masons recorded the highest percentage ... of absenteeism followed by handymen . . ."

5. "Sustained postures were the most important job-risk factors leading to occupationally-related LBP among construction manual workers."

Table 3. Functional limitation of the participants due to low back pain (n=54)

	Good		Bad		P-value
	Frequency	%	Frequency	%	
Stand	28	52%	26	48%	0.785
Walk	33	61%	21	39%	0.102
Sit	33	61%	21	39%	0.102
Lay down	35	65%	19	35%	0.029*
Run	24	44%	30	56%	0.414
Carry	20	37%	34	63%	0.057
Lift	17	31%	37	69%	0.006**
Throw	40	74%	14	26%	0.000**
Put on and take off a sweater	45	83%	9	17%	0.000**
Put on and take off socks	25	46%	29	54%	0.586
Bend your back forward	15	28%	39	72%	0.001**
Bend you back backward	18	33%	36	67%	0.014*
Side-bend your back to the right	24	44%	30	56%	0.414
Side-bend your back to the left	24	44%	30	56%	0.414
Turn your back to the right	25	46%	29	54%	0.586
Turn your back to the left	27	50%	27	50%	1.000
Walk upstairs	24	44%	30	56%	0.414
Walk downstairs	29	54%	25	46%	0.586
Squat down	20	37%	34	63%	0.057
Jump with both feet together	27	50%	27	50%	1.000
Lift your right leg when laying down	21	39%	33	61%	0.102
Lift your left leg when laying down	20	37%	34	63%	0.057
Lift your right leg, when sitting	24	44%	30	56%	0.414
Lift your left leg sitting	25	46%	29	54%	0.586
The condition of your work condition	40	74%	14	26%	0.000**
Your general health	51	94%	3	6%	0.000**
Your return to work	41	76%	13	24%	0.000**

* P-value<0.05
**P-value<0.01

Table 4. Participation restriction due to low back pain among participants (n=54)

Item	Mean	Mode
Interference with normal work	5.76	6
Affected ability to lift overhead, grasp objects, or reach for things	5.58	4,5 & 7
Affected your ability to lift objects off the floor, bend, stoop, or squat	6.45	5 & 8
Affected ability to walk or run	6.42	7
Income declined since your pain began	6.05	6 & 8
Take pain medication every day to control pain at work	5.47	5
Forced to see doctors much more often than before pain began	6.03	5
Interfere with ability to see people who are important to you such as you would like	6.68	5
Interfere with recreational activities and hobbies	7.56	10
Need the help of family and friends to complete everyday tasks	5.97	6
Feel more depressed, tense, or anxious than before pain began	6.05	5 & 7
Emotional problems interfering with family, social and/or work activities	5.20	3