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Low back pain prevalence amongst industrial workers in the private sector in Oyo State, Nigeria

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Summary

A cross sectional study was conducted in order to investigate the prevalence of low back pain (LBP) in industrial workers and the association between certain job – related tasks and the prevalence of low back pain. Data on 515 males and 89 females who were workers in the selected industries in the private sector in Ibadan City Oyo State Nigeria were collected using a self administered questionnaire and analyzed. The point prevalence of LBP in the workers was 59.7 percent while a 12 month prevalence of LBP was 59.5 percent. Job activities which involved sitting ($P=0.03$) and lifting ($P=0.006$) were significantly associated with occurrence of low back pain respectively while those which involved standing ($P=0.61$) and vibration ($P=0.12$) were not associated with the occurrence of LBP among the workers. Physical exercise or lack of it was not associated with LBP ($P=0.96$). Lifestyle factors such as alcohol consumption ($P=0.80$), cigarette smoking ($P=0.92$) and tobacco snuff taking ($P=0.26$) were not associated with occurrence of LBP. In conclusion, the job related tasks that predisposed the industrial workers to low back pain included sitting and lifting activities while those of standing and vibration did not have any significant effect on the prevalence of LBP.

Keywords: Low back pain, occupational groups, point prevalence, job tasks, Nigeria.

Resume

Une étude d'échantillon d'un groupe avait été faite pour étudier la fréquence des lombalgies parmi les employés du milieu industriel et le lien entre certains travaux à tâches liées et la fréquence des lombalgies. Les données sur 515 hommes et 89 femmes qui travaillaient dans des industries sélectionnées du secteur privé de la ville d'Ibadan, dans l'état d'Oyo, ont été ramassées en utilisant un questionnaire auto administré et analysées. Le point de fréquence de LBP (lombalgie) parmi les employés était 59.7%. Les activités de travail qui impliquent le séant ($P=0.03$) et l'élévation ($P=0.006$) étaient majoritairement liées à l'occurrence de lombalgie, cependant ceux qui impliquaient l'arrêt ($P=0.61$) et la vibration ($P=0.12$) n'étaient pas liés à l'oc

currence de LBP parmi les employés. Les exercices physiques ou leur manque n'étaient pas liés au LBP ($P=0.96$). Les facteurs de mode de vie tels que la consommation d'alcool ($P=0.80$) la cigarette ($P=0.92$) et la prise de tabac ($P=0.26$) n'étaient pas liés à l'occurrence de lombalgies. En conclusion, les tâches reliées au travail qui ont prédites les employés des industries aux lombalgies ont incluses les activités du séant et l'élévation alors que celles de l'arrêt et de la vibration n'avaient aucun effet important sur la fréquence de lombalgies

Introduction

Low back pain (LBP) as a common health problem has been reported in several parts of the world. It is a universal problem which is regarded as man's most important non life - threatening disease [1]. It is one of man's oldest complaints and a big cause of social distress in many populations [2]. In the United States of America, back disorders are the primary causes of activity limitation in both men and women [3]. In industrial societies LBP has been documented as a costly public health issue for both workers and management. It is the most common and costly musculoskeletal problem affecting the working population [4]. Prevalence of LBP in consonance with associated risk factors especially with respect to job related tasks cannot be overemphasized.

Vening *et al*, [5] reported that many back injuries are occupational in nature especially those occupations related to lifting and repeated activities. Persons in occupations that require repetitive bending and lifting are known to have a high risk of LBP [6] Hoogendorn *et al*, [7] also reported bending, twisting and whole body vibration as risk factors for low back pain. In Nigeria however, there is a dearth of information concerning prevalence of LBP in the industrial population. Furthermore, little is known about the job related tasks which predispose these workers to LBP. The purpose of the present study therefore was to investigate the prevalence of LBP in the workers in these industries and to investigate possible association between their job-related tasks and occurrence of LBP.

Materials and methods

Population

The population for this study consisted of workers from nine industries. These were plastic manufacturing, soft drink bottling, fruit juices and food processing industries in Ibadan City, Oyo State, Nigeria. Selection was based on

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accessibility and cooperation of the management of these industries. A four-part, self designed structured questionnaire was used. It was distributed to the members of staff of the industries after obtaining their informed consent. The questionnaire had multiple items related to their present and past LBP complaints. Severity of LBP symptoms was registered by the subjects with a visual analogue scale [8] and also categorized as mild, moderate or severe based on the patient's perception.

Education was measured as the final school background using a modification of the method of Otani *et al*, [9] where participants in the study were categorized into compulsory education, high school education and post secondary education. In this study, subjects were categorized into 4 groups: no formal education, primary school education, secondary school education and tertiary education. Specific items in the questionnaire dealt with job classification and lifting activities, the use of heavy equipment and driving of motor vehicles (forklifts, trucks, and buses). Current recreational activities and time lost from work due to LBP. Data collection spanned over a period of four months.

According to the method of Bergenudd and Wilsson [8] and Riihimaki *et al* [10], data on occupations were divided into three groups for workload evaluation: Group 1 consisted of jobs with heavy physical demands like operating machinery, operating packaging, manual packing and loading operations and other heavy technical duties. Group 2 included jobs with moderate physical demands such as laboratory work, damage sorting and other relatively light industry duties. Group 3 consisted of light physical work such as those involving purely administrative duties or office duties.

Alcohol consumption was rated by using modified questions adapted from the 'Alcohol Use Disorders Identification' (AUDIT) developed by the World Health Organization [11] Cigarette smoking was rated by categorizing the subjects as never smoked, smoked in the past but not anymore, smoke now occasionally, smoke daily. Tobacco snuff taking was also rated according to the categories indicated for smoking above.

Treatment of data

The open ended questions in the questionnaire were coded and the whole data were analyzed using the statistical package SAS (Statistical Analysis System) version 6.04. Descriptive statistics of frequencies and percentages were used in describing some categorical variables and these were equally analyzed by using Chi-square contingency table technique. The level of significance was set at 0.05.

Results

Fully completed questionnaires were obtained from 604 of the total 1,140 questionnaires given out to the industrial workers. This represents a response rate of 53 percent.

Basic demographics

The study population consisted of 604 industrial workers aged from 20 to 60 years. The occupational groups included those jobs with heavy physical demands, moderate physical demands and light physical demands. Of the 604 workers, 515 (85.3 percent) were male and 89 (14.7 percent) were female. This can be observed in Table 1.

Table 1: Socio-demographic Characteristics of Respondents (n=604)

Characteristics	No	% Total
<i>Sex</i>		
Male	515	85.3
Female	89	14.7
<i>Age group (years)</i>		
20-25	154	25.5
26-30	154	25.5
31-35	133	22.0
36-40	75	12.4
41-45	52	8.6
46-50	22	3.6
51-55	11	1.8
56-60	3	0.5
<i>Education</i>		
None	12	2.0
Primary	36	6.0
Secondary	271	44.9
Tertiary	285	47.2
<i>Marital status</i>		
Never married	251	41.6
Married	347	57.5
Divorced	1	0.2
Separated	3	0.5
Widowed	2	0.3
<i>Occupation</i>		
Heavy physical	351	58.1
Moderate physical	26	4.3
Light physical	227	37.6

Prevalence of low back pain

The point prevalence of LBP in this group of workers was 59.7 percent, while a 12- month prevalence was 59.5 percent. When stratified according to the occupational groups 211/351 (60.1%) of those in heavy physical demand jobs, 19/26 (73.1%) of those in moderate physical demand jobs and 130/227 (57.3%) of those in light physical demand jobs reported low back pain during the period of the study (Table 2). However, only 75 (12.4%) of the study population reported that they had missed workdays in the last 12 months because of their LBP and this accounted for a total loss of 75 workdays. Prevalence of LBP was highest among workers who had worked for 1-5 years (66.1%). However no significant association was found between LBP preva-

lence among workers with different durations of employment ($P=0.16$).

Table 2: Prevalence of low back pain among the occupational groups.

Occupational Group	Total No of subjects	No with LBP	Prevalence (%)	X ²	Prob
Group 1	351	211	60.1	2.54	0.28
Group 2	26	19	73.1		
Group 3	227	130	57.3		

Key

Group 1 – Jobs with heavy physical demands.

Group 2 – Jobs with moderate physical demands.

Group 3 – Jobs with light physical demands

Occupational Risk Factors

Lifting heavy objects and vibratory activity were the most commonly reported work activity that caused low back pain in 66% and 67.8% respectively of the respondents, while 62.4% and 62.3% implicated prolonged standing and sitting activities respectively as being responsible for their LBP. Additionally, job related activities of lifting ($P=0.006$) and sitting ($P=0.03$) were also found to be statistically significantly associated with occurrence of LBP (Tables 3 and 4).

Table 3: Prevalence of low back pain and duration of sitting at work

Duration of sitting per day (Hours)	Number of Workers. Total	With low back pain	%	X ²	Pvalue
<1	161	106	65.8	8.74	0.03
1-2	113	61	54.0		
2-4	87	43	49.4		
5 and above	228	143	62.7		

Table 4: Prevalence of low back pain and lifting activity.

Lifting activity	Respondents. with LBP	Respondents without LBP	X ²	P-Value.
Yes	167	86	7.41	0.006
No	181	149		

Lifestyle factors and prevalence of LBP.

Considering the prevalence of LBP in relation to lifestyle factors such as alcohol consumption, cigarette smoking and tobacco snuff taking, no significant association existed between LBP prevalence among workers and alcohol consumption ($P=0.80$), as well as between LBP prevalence and cigarette smoking ($p=0.92$) and tobacco snuff usage and LBP prevalence ($P=0.26$).

Discussion

In this study, the highest point prevalence of LBP was observed among workers in jobs with moderate physical demands followed closely by those in jobs with heavy physical demands. There was no significant association between the type of occupational group and the occurrence of LBP among the participants. This probably implies that the physical demand of the workplace for the workers in this study did not necessarily affect the prevalence of LBP. Thus, other factors which were not the focus of this study, might have contributed to the prevalence of LBP in this group of workers. For example Riihimaki *et al* [10] reported that education and social class were related to many lifestyle factors that may affect the occurrence of LBP. In addition, Skov *et al* [12] reported that certain factors such as job demands, job controls and supports on the job are psychosocial risk factors, which were associated with LBP in sedentary workers. These factors were however not considered in this study.

There was no association between LBP prevalence and duration of employment of the respondents. However, it was particularly noteworthy that majority of the workers who reported LBP were in the first to fifth year of their employment. The reason for this observation was not clear.

The importance of occupational factors in the causation of low back pain has been acknowledged [6,7,13,14]. In this study, the point prevalence of LBP in the selected industries was 59.7% while a 12-month prevalence was 59.5%. These rates are higher than that reported by Hillman *et al* [15] in which 19% point prevalence of LBP was observed in the industrialized British adult population. It was however similar to that of Lebouf – Yde *et al* [16] where a 12-month prevalence of 54% of LBP was reported in a Danish study population. Deyo *et al* [17] and Liebensohn *et al* [18] also reported a 12-month prevalence rate of 50%.

Prevalence of LBP was associated significantly with frequently used positions during work activities. There was no significant association between occurrence of LBP and time spent standing but there was a significant association between occurrence of LBP and time spent sitting at work. This finding is contrary to that of Mcfarlane *et al* [19] who reported that occupational activities including lengthy periods of standing were associated with occurrence of low back pain and that of Hartvigsen *et al* [20] who reported that sitting while at work was not associated with low back pain.

A significant association observed in this study between lifting chores at work and prevalence of LBP is in agreement with various studies that reported that activities involving lifting is relevant to low back pain complaints [13,21]. According to Apts [1] when under load of lifting, the trunk muscles (back and abdominal muscles) should stabilize the spine in its normal posture. However, when bent at the waist, the back muscles are not working in this posture, rather the spinal ligaments and lower back spinal joints are stretched and the discs are under greater stress, thus predisposing to LBP[1]. The industrial workers involved in this study might have been predisposed to LBP as a result of wrong lifting techniques.

The results of this study revealed that educational background and physical demand of work were not associated with prevalence of LBP. This is contrary to the reports of previous studies [22,23]. This may suggest that other factors, which were not considered in this study in consonance with occupational activities, were responsible for occurrence of LBP. In addition, exposure to mechanical vibration was found to have no significant association with low back pain complaints even though a high percentage of individuals (67.8%) involved in vibratory activities reported low back pain.

Alcohol consumption and cigarette smoking were lifestyle factors, which showed no significant association with LBP in this study. This is contrary to the report of studies in western populations by Brage and Bjerkedal [24], Scott *et al* [25] and Otani *et al* [9]. The difference between the finding of this study and those of the studies cited could be that a greater percentage of subjects in those study populations were smokers when compared to the subjects involved in smoking in the present study. Furthermore, tobacco snuff taking showed no significant relationship with prevalence of LBP although respondents who used tobacco snuff daily recorded the highest prevalence of LBP.

In this study, no significant association existed between participation in physical exercise and incidence of LBP. A number of respondents complained of a lot of tiredness after work, hence they found it difficult to get involved in any routine form of exercise. However 22.8% of those who reportedly engaged in one form of physical exercise or the other reported less occurrence of low back pain. The result here is somewhat similar to that of Frymoyer *et al* [13] who reported that recreational activities had a low relationship with LBP complaints.

The socio-economic impact of low back pain was assessed by asking if the respondents obtained any sick leave from work due to LBP in the past one year. Only 75 (21.4%) of the respondents had obtained sickness absence from work even though as many as 351 (78.6%) of respondents complained of low back pain. This may be an indication that many of the industrial workers go to work in spite of their LBP disability. It is also noteworthy that 68 percent of these workers reported their LBP as being mild hence

they could still manage to work with it. Furthermore most of the participants were casual (daily paid) workers hence they could not afford to be absent from work since the rule of no work no pay would have been applied to them.

Recommendations

On the whole, based on the results of this study it is recommended that the industrial workers involved in manual material lifting and packaging need to be taught good lifting techniques so as not to be predisposed to LBP. Future studies could look at the relevance of psychosocial factors such as job satisfaction, social class and family background on prevalence of LBP in individuals with different physical job demands.

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