Factors associated with low back pain among cleaners in a tertiary hospital in Nigeria

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Original Article

ABSTRACT

Objective: To determine the magnitude and factors associated with low back pain (LBP) among hospital cleaners at the University College Hospital (U.C.H), Ibadan.

Method: This is a cross-sectional study conducted amongst all the cleaners working at U.C.H, Ibadan. The main outcome measurements were prevalence of LBP, socio-demographic characteristics and description of cleaning activities.

Results: One hundred and forty-nine hospital cleaners (136 females and 13 males) with a mean ± age of 34.7 ± 8.5 years were interviewed. The point prevalence of LBP was 77.2%. The respondents worked an average of 8.3 hours (4 -12 hours) each day. Cleaning activities were performed an average of 3 times each day (1 - 6 times). The prevalence of LBP was significantly associated with working more than 8 hours a day ($p = 0.031$), living above the poverty line ($p = 0.021$), completion of at least 9 years of formal education ($p = 0.027$) and not being in marriage ($p = 0.003$).

Conclusion: The high prevalence of LBP among hospital cleaners in our setting is worrisome and efforts should be made by physicians to detect the presence of modifiable factors associated with low back pain among hospital cleaners they encounter during clinical consultations.

Key words: Cleaners; low back pain; risk factors; prevalence.

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Les facteurs associés à la lombalgie chez les nettoyeurs dans un hôpital tertiaire au Nigeria.

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Article Original

RÉSUMÉ

Objectif: Pour determiner l'ampleur et elements caractéristiques associés à la lombalgie (LBP) parmi les nettoyeurs hôpitaux à l' hôpital du collège Universitaire (H.C.U) Ibadan.

Méthode: C'est une étude transversale menée auprès de tous les nettoyeurs a U.C.H, Ibadan. Les Principes et mesures de resultants étaient la prévalence des lombalgies, les caractéristiques socio-démographiques et la déscription des activités de nettoyage.

Résultat: 149 nettoyeurs hôpitaux (136 femmes et 13 hommes) avec un moyenâge ± de 34.7± 8.5 ans ont été interrogés. La prévalence de point de LBP était 77.2% Les répondants ont travaillé une moyenne de 8.3 leurres (4 – 12 leurres) chaque jour. On a fait le nettoyage une moyenne de 3 fois par jour (1 – 6 fots). La prévalence de LBP était associée significativement avec travail plus de 8 heures par jour (p = 0.031), vivant au-dessus du seuil de pauvreté (p = 0.021), Achèvement d'au moins 9 ans de l'éducation formelle (P= 0.027) et N'étant pas dans le mariage (P = 0.003).

Conclusion: La forte prévalence de la lombalgie parmi les nettoyeurs hôpitaux dans notre contexte estinquiétant et des efforts doivent être fait par les médecins pour détecter la présence de facteurs modifiables associés à la lombalgie parmi nettoyeurs hôpitaux qu'ils rencontraient lors des consultations cliniques.

Mots Clés: Nettoyeurs, la lombalgie, les facteurs de risqué, la prévalence

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INTRODUCTION

Low back pain (LBP) is referred to as the non-traumatic pain affecting the first lumbar vertebra to the first sacral vertebral of variable duration (1). LBP is not a diagnostic entity or a disease of sort, but pain in the lower back as reported by the sufferers (1,2).LBP can present both as acute and chronic back pain (3.4).LBP could be regarded as a common healthcare problem as most adults will experience LBP at some periods in their lives (5).LBP is an ailment that presents to the primary care physicians and it is one of the ten commonest reasons for encounter in primary care settings (6).An estimated one-fifth of the patients attending the primary care physician's office do so on account of LBP (7). It has also been estimated that thirteen million physician office visits have been attributed to chronic LBP alone and is a common cause of functional disability (4). The prevalence of LBP is high and similar across all cultures. It adversely affects the performance at work and impairs the quality of life (1). LBP is often complicated by social, psychological and economic factors; thus making the finding of the aetiology of the pain difficult despite the recent advances in diagnostic technologies (8).

The annual incidence of back pain in the adult population is about 66.7% (7).The lifetime prevalence of LBP is 80% among Americans (9). The prevalence of LBP among the general population in many industrialized countries ranges from 21% to 39%, with higher prevalence reported among workers in the occupational settings associated with the lifting of heavy loads (10,11).Louw et al in a systematic review reported a point prevalence of 32% among adult Africans (12).In Nigeria, a point prevalence rate of 47% and 55.2% had been reported among hospital cleaners in a rural and an urban hospital respectively (13).

LBP is a common cause of work-related disability and comes second in the order of importance as the reason for work-place absenteeism. It associated with early retirement, poor quality of the individuals' lives and decrease productivity at work (4,14). Employers often require their employees to see a doctor, because LBP is the most common reason for employee disability up to the age of 45 years and the third most common for workers older than age 45 years (15).The burden of LBP is huge with a study in the North America which revealed that LBP was the leading cause of disability and morbidity in middle-aged persons, and was by far the most expensive source of workers' compensation costs (14).

The onset of LBP symptoms are strongly related to the lifestyle habits, work and non-work related psychosocial factors and work-place exposure experienced by the individual (5).The most common cause of LBP is the repetitive use of improperly stretched and toned muscles, although inflammatory, infectious, or neoplastic conditions may cause LBP occasionally (16).Back pain can also occur from disorders of visceral structures immediately anterior to the spine: aorta, kidney, intestine, pancreas, stomach, gall bladder, prostate, uterus and pancreas (14,17).However, 80% of the time, a precise pathologic location or aetiology will not be found (14,17).Factors that predispose patients to LBP include obesity, poor muscle tone, smoking, bad work habits, wearing of high-heeled shoes, and lack of physical activity (4).Other factors associated with LBP are prolonged standing or sitting, repetitive bending at the hip, heavy physical work and adoption of poor posture while lifting heavy load (13).

LBP affects virtually all health workers, but most studies on LBP had focused on the nurses and few on the physiotherapists while other cadres of hospital workers especially the cleaners who are prone to muscular strains and stresses during work were often not addressed (13).This group of workers will benefit from

health education on the prevention of LBP in the work-place (13).Therefore, there is a need to study LBP among categories of workers such as cleaners, who are often seen along the hospital driveways and in the wards and clinics adopting a very poor posture when carrying out cleaning activities. Furthermore, physicians seldom inquire about LBP in the patients they see because it is often considered a less important health problem (18). The objective of this study was to determine the prevalence of LBP among cleaners working in a busy tertiary health institution and the associated risk factors such as socio-demographic characteristics, work-related conditions and activities associated with LBP among cleaners in a tertiary health centre in South Western Nigeria.

MATERIALS AND METHODS

Study site: This study was carried out at the General Outpatients (G.O.P.) Clinic of the Department of Family Medicine, University College Hospital (U.C.H.), Ibadan, Nigeria. The G.O.P clinic gives care at the primary and secondary levels in U.C.H. It receives most of the patients presenting to the hospital.

Study design: This was a cross-sectional study of 149 cleaners working at the U.C.H. between May 2011 and July 2011.

Study population: The respondents were cleaners who were primarily employed by seven different cleaning companies contracted by the hospital management. They included male and female individuals who carried out cleaning jobs such as sweeping, mopping and dusting activities.

Procedure: The respondents were interviewed using a pretested structured questionnaire. Information was obtained on the respondents' socio-demographic characteristics such as age, marital status, educational level, previous occupation, living arrangement, number of children, income and financial support. Detailed history of their daily cleaning activities was obtained and the postures they commonly adopted during various cleaning activities were depicted pictorially in the questionnaire. LBP was assessed subjectively among the respondents by asking them "Do you have low back pain?" The height and weight of the respondents were the anthropometric measurements carried out. The structured questionnaire was administered by a trained interviewer and took about 20 minutes to be administered.

Ethical issues: The study received the approval of the Chief Medical Director of U.C.H, the head of department of Family Medicine and the supervisors of each cleaning company.Before the questionnaire was administered, we obtained the informed consent of the respondents.

Data Analysis: The questionnaires were cross checked at the end of each study day. SPSS version 16 (Chicago il, USA) was used for data entry, cleansing and analysis.Socio-demographic characteristics of the respondents were described using the descriptive statistics. Association between categorical variables were tested using the Chi square statistics. The relationship between the identified risk factors and LBP was explored with logistic regression analysis. The significance level was set at 5%.

RESULTS

One hundred and forty nine respondents employed by cleaning companies were interviewed. They comprised of 136 (91.3%) females and 13 (8.7%) males (female to male ratio = 10.5: 1). Their mean ± SD age was 34.7 ± 8.5 years (range 17 - 55 years) and the modal age group was (30 – 39) years. Most of respondents 107 (71.8%) were currently married and 24 (16.1%) were single. Highest proportion of the respondents 70 (47.0%) completed the secondary school education, while a few 4 (2.7%) had no formal

education. Their median monthly income was 6000 (IQR 5000 - 10000) Naira. Previous occupational activities showed that 64 (43.0%) respondents were traders and 55 (36.9%) were unemployed. Eighty-eight (59.1%) were self-supporting financially with 36 (24.2%) of them having additional financial support from their spouses. Living arrangement showed that 30 (20.1%) respondents lived alone. The average number of children by the respondents was 3 (range 0 – 7 children). This is shown in table 1.The mean ± SD height and weight of respondents was 1.46 ± 0.25 metres (range 1.00 -1.79 metres) and 54.5 ± 0.9 kg (range 38.0 - 85.0 kg) respectively. Their mean ± SD body mass index (BMI) was 27.5 ± 10.2 kg/m^2 (range 15.7 - 47.0 kg/m^2).

The respondents had spent an average duration of 2.1 years (range 1 - 8 years) at their current cleaning jobs. They worked an average of 8.3 hours (range 4 -12 hours) each day and rested for an average period of 1.4 hours (range 0.5 - 5.0 hours) each day during the working period. The respondents worked an average of 6.0 days each week (range 5 - 7 days) and performed cleaning activities an average of 3 times each day (range 1 - 6 times). In the previous one month, of the 115 respondents with LBP, 65 (56.5%) used non-steroidal anti-inflammatory drugs (NSAIDs), while 31.3% could not recall the analgesics they used. Paracetamol was used by 8.7%, while 1.7% used native medications and 1.7% used Novalgin. Respondents who had LBP were older than those without LBP (34.9 ± 8.9 years vs 34.1 ± 7.4 years) t = 0.457, p = 0.648. Also, respondents who reported LBP were heavier than those without LBP (55.1 ± 9.6 kg vs 51.3 ± 7.0 kg) t = 1.293, p = 0.201. However, respondents who did not report LBP were taller than those who reported having LBP (1.6 ± 0.1 metres vs 1.4 ± 0.3 metres) t = 1.314, p = 0.194. The body mass index (BMI) of respondents who reported LBP was significantly higher when compared with those who did not report LBP (28.7 ± 10.8 kg/m^2 vs 21.4 ± 2.6 kg/m^2) t = 2.131, p = 0.038.

The socio-demographic characteristics and the prevalence of LBP are shown in Table 2. The point prevalence rate of LBP among the cleaners was 77.2%. Higher proportion of male cleaners 11 (84.6%) had LBP compared with their female counterparts 104 (76.5%) without a significant difference (Fisher's exact test; p = 0.504). The prevalence of LBP was higher in respondents older than 40 years (83.8%) compared with their younger counterparts (75.6%) without statistical difference (χ^2 = 0.807, p = 0.369). Higher prevalence of LBP was observed among respondents who were not currently married (90.5%) compared with those who were currently married (72.0%) with a statistical significance (χ^2 = 9.074, p = 0.003). Respondents who had completed 9 years of formal education had significantly higher prevalence of LBP than those who had not (84.9% vs 69.7%) (χ^2 = 4.887, p = 0.027). Living arrangement showed higher prevalence of LBP among respondents who were living alone (86.7%) compared with those living with other family members (74.8%) without statistical significance (χ^2 = 1.919, p = 0.166). All the respondents earned below the Nigerian minimum wage of 18,000 Naira ($120) each month. The income of the respondents was classified along the World Bank's poverty line definition of less than $1.25 per day. Cleaners who earned more than $1.25 per day had higher prevalence of LBP compared with those earning less than this amount (83.5% vs 67.2%) (χ^2 = 5.328, p = 0.021).

The cleaning activities and posture adopted by the respondents and the prevalence of LBP are described in Table 3. The prevalence of LBP was higher among respondents who described themselves as being overworked, who did not receive help from colleagues, who were under pressure to complete their cleaning duties and worked more than 8 hours each day. Similarly, the

prevalence of LBP was higher among respondents who were satisfied with their jobs and observed rest periods during the cleaning activities. There was no significant association between the postures adopted by the respondents during the sweeping, mopping and other activities and the prevalence of LBP. Logistic regression analysis did not show any factor to be most significantly associated with LBP. This is shown in table 4.

DISCUSSION

Low back pain is a common health complaint among hospital staff especially those doing the cleaning job in the setting. Studies in Nigeria had shown that the prevalence of LBP among hospital staff in rural and urban settings was 46% and 47.8% respectively (13,19). In these studies, 47% of hospital cleaners in the rural setting (Igbo-Ora, Oyo state, Nigeria) had LBP, while a higher proportion (55.2%) of hospital cleaners in the urban setting (Ibadan, Oyo state, Nigeria) had LBP (13,19).In this study, the point prevalence of LBP among hospital cleaners was higher (77.2%) than those reported in previous studies.The higher prevalence of LBP in this study may indicate an increasing magnitude of the problem in view of poor posturing habits, increased duration at cleansing work and daily stress in our environment.

Elsewhere in Africa, a study on low back pain among Nigerian and Ethiopian Nurses reported an overall point prevalence 70.9% (20). Similarly, a study of LBP among hospital workers in Tunisia showed a prevalence of 57.7% (21).Among hospital workers in Turkey, 65.8% of them had LBP (22).The prevalence of LBP varies widely because of the differences in individual perception of physical pain, occupational variation and cultural differences. In addition, the presence of psychosocial, physical and individual risk factors of LBP including the dissimilarities in question phrasing have been noted as the reasons for the differences in the prevalence rates reported in different studies. These could account for the dissimilarity in the rates reported in our study and other Nigerian studies (13,19).

There was a preponderance of female respondents in this study who outnumbered the males 10.5 to 1. This is not surprising as cleaning jobs is culturally seen as the duty of the female members of the Nigerian society. Despite the predominance of female cleaners in the hospitals; most studies reported higher prevalence of LBP among male cleaners than their female counterparts (13). In this study, there was a higher attributable proportion for LBP in the male cleaners compared with the females without a statistical difference. This had been attributed in previous studies to higher participation of male hospital cleaners in cleaning activities which involve heavy lifting loads such as moving furniture and heavy garbage bins (2,13,23).

The point prevalence of LBP was higher among older respondents, but the difference was not statistically significant. This observed increase could not be attributable to age alone as other risk factors like sex, level of physical activities, previous back injuries and posture adopted during routine daily activities have been found to predispose an individual to LBP (13). Majority of the respondents were married, and about a half of them could be described as being 'literate', that is, had completed the mandatory nine years of formal schooling. This corroborated the findings in a study done on LBP in which a similar proportion of the respondents (56.3%) had certificate of education (14).Respondents who were 'literates' had a significant higher prevalence of LBP. This was contrary to the finding of Biglarian et al., who reported a significant association between low educational status of Iranians and LBP (24). Factors such as increased health awareness among literate people in our setting (25);previous exposure

to physical activities involving the low back and previous back trauma may have contributed in part to this finding (26). Since, our study used self-report to determine cases of LBP, the observations noted above may affect the generalizability of this finding of literacy level with the development of LBP to the entire baseline sample and by extension the general population from which this sample was drawn.

The monthly income of all the respondents was below the new Nigerian minimum wage of 18,000 Naira ($120) each month. This average monthly income of the respondents 6,000 Naira ($37.50) was less than that from a study in which the respondents earned an average monthly salary of $773.70 (14).A third of the respondents were traders before commencing their present job as cleaners, while another third were unemployed.

The long working hours and busy work schedule were contributory to the LBP among the respondents. Gou reported a positive correlation between the prevalence of LBP and the time spent on repeated bending, twisting, or reaching (RBTR) and repeated strenuous physical activities (RSPA) (27). Being under pressure to complete cleaning activities and perception of the job as being strenuous could lead to job dissatisfaction. Workers who stated that they "hardly ever" enjoyed their job tasks were reported to be 2.5 times more likely to report a back injury than those who "almost always" enjoyed their job tasks (4). Similarly, higher proportion of respondents who described themselves as being overworked reported having LBP.

There was no significant association between the postures adopted by the respondents during their cleaning activities and the prevalence of LBP. This differed from the report by Punnet et al. among the workers in the United States of America (USA) where an estimated 65% of LBP cases were attributed to the deleterious effects of occupational exposures (2). Others include non-neutral body postures (either dynamic or static), mechanical pressure concentrations, vibration (both segmental and whole-body) and low temperature (2). Our findings also differed from that done among rice farmers in Thailand by Taechasubamon et al., in which most of the farmers having LBP stated that their back pain was worsened by bending forward, slouched sitting and lifting of heavy load, but was lessened by straight sitting and back extension in standing position (23).

The strength and weaknesses of the results of this study need to be considered. The strengths of this study were the recruitment of all the consenting hospital cleaners from all the seven cleaning companies and the employment of face to face direct interview by a well-trained interviewer rather than the use of postal or telephone interview. The weaknesses were the reliance on self-report for determining the respondents with LBP and the use of cross-sectional design which makes generalization of the results difficult. The perception of one's health varies according to the level of health awareness and the cultural perception of illness (28). LBP is neither a disease nor a diagnostic entity as it is the perception of pain as reported by the sufferers and it is liable to false-positives. However, it is the most feasible assessment measure we could employ in our study.

CONCLUSION

The prevalence of LBP was very high among hospital cleaners in this study. LBP is a highly preventable condition if measures are taken to reduce repeated motions as well as bending in the work place for a prolonged period. Health education of hospital cleaners should be embarked upon periodically in order to prevent the occurrence of LBP.

Conflict of interest: There is no conflict of interest declared.

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Table 1: Socio-demographic characteristics of the respondents

	Female n = 136 (%)	**Male n = 13 (%)**	**Total N = 149 (%)**
Age group (years)			
≤30	40(45.5)	13(54.5)	53(100.0)
31-40	66(100.0)	0(0.0)	66(100.0)
41-50	28(100.0)	0(0.0)	28(100.0)
>50	2(100.0)	0(0.0)	2(100.0)
Marital status			
Single	12 (50.0)	12 (50.0)	24 (100.0)
Married	106 (99.1)	1 (0.9)	107 (100.0)
Separated	3 (100.0)	0 (0.0)	3 (100.0)
Divorced	1 (100.0)	0 (0.0)	1 (100.0)
Widowed	14 (100.0)	0 (0.0)	14 (100.0)
Educational level attained			
No formal Education	4 (100.0)	0 (0.0)	4 (100.0)
Primary school	29 (100.0)	0 (0.0)	29 (100.0)
Junior secondary school	42 (97.7)	1 (2.3)	43 (100.0)
Senior secondary school	59 (89.4)	11(10.6)	70 (100.0)
Tertiary	2 (66.7)	1 (33.3)	3 (100.0)
Living arrangement			
Alone	18 (60.0)	12 (40.0)	30 (100.0)
With spouse only	37 (100.0)	0 (0.0)	37 (100.0)
With spouse and children	72 (84.3)	1 (15.7)	73 (100.0)
With spouse, children, parents and in laws	9 (100.0)	0 (0.0)	9 (100.0)
Number of Children			
None	12 (52.2)	11 (47.8)	23 (100.0)
1-2	25 (96.2)	1 (3.8)	26 (100.0)
3-4	59 (98.3)	1 (1.7)	60 (100.0)
≥5	40(100.0)	0(0.0)	40(100.0)
Financial support			
Self	75 (85.2)	13 (14.8)	88 (100.0)
Spouse	36 (100.0)	0 (0.0)	36 (100.0)
Parents	18 (100.0)	0 (0.0)	18 (100.0)
Children	2 (100.0)	0 (0.0)	2 (100.0)
Friends/Relatives	5 (100.0)	0 (0.0)	5 (100.0)
Income each month (Naira)			
5000–5999	57(98.3)	1(0.7)	58(100.0)
6000–6999	61(89.7)	7(10.3)	68(100.0)
7000–7999	3(100.0)	0(0.0)	3(100.0)
8000–8999	14(82.4)	3(17.6)	17(100.0)
≥9000	1(33.3)	2(66.7)	3(100.0)
Previous occupation			
Trading	64 (100.0)	0 (0.0)	64 (100.0)
Unemployed	46 (83.6)	9 (16.4)	55 (100.0)
Cleaner	7 (70.0)	3 (30.0)	10 (100.0)
Hair dresser	9 (100.0)	0 (0.0)	9 (100.0)
Fashion designer	7 (100.0)	0 (0.0)	7 (100.0)
Technician	2 (66.7)	1 (33.3)	3 (100.0)
Farming	1 (100.0)	0 (0.0)	1 (100.0)

Table 2: Socio-demographic characteristic by prevalence of LBP

	Low back pain		
	Yes= 115 n (%)	**No = 34 n (%)**	**Total = 149 N (%)**
Age group (years)			
≤40	90(75.6)	29(24.4)	119(100.0)
>40	25(83.3)	5(16.7)	30(100.0)
χ^2 = 0.807, df = 1 p = 0.369			
Sex			
Male	11 (84.6)	2 (15.4)	13 (100.0)
Female	104 (76.5)	32 (23.5)	136(100.0)
Fisher's; p=0.504 †			
Marital status			
Not currently married	38 (90.5)	4 (9.5)	42 (100.0)
Currently married	77 (72.0)	30 (28.0)	107 (100.0)
χ^2 = 9.074, df = 1 p = 0.003*			
Years of Formal Education Completed			
Did not complete 9 years of Schooling	53 (69.7)	23 (30.3)	76 (100.0)
Completed 9 years of Schooling	62 (84.9)	11 (15.1)	73 (100.0)
χ^2 = 4.887, df = 1 p = 0.027*			
Living arrangement			
Alone	26 (86.7)	4 (13.3)	30 (100.0)
With others	89 (74.8)	30 (25.2)	119 (100.0)
χ^2 = 1.919, df = 1 p = 0.166			
Number of Children			
0-4	80 (73.4)	29 (26.6)	109 (100.0)
≥5	35(87.5)	5(12.5)	40(100.0)
χ^2 = 3.306, df = 1 p = 0.069			
Financial support			
Self-supporting	68 (77.3)	20 (22.7)	88 (100.0)
Depends on others	47 (77.1)	14 (22.9)	61 (100.0)
χ^2 = 2.072, df = 1 p = 0.150			
Monthly income			
Below the poverty line (<$1.25 a day)	39 (67.2)	19 (32.8)	58 (100.0)
Above the poverty line (≥$1.25 a day)	76(83.5)	15(16.5)	91(100.0)
χ^2 = 5.328, df = 1 p = 0.021*			

*Significant at 5% level of significance

† Fisher's exact test

Table 3: Cleaning activities and posture of respondents by the prevalence of LBP

	Low back pain		
	Yes= 115 n (%)	**No = 34 n (%)**	**Total = 149 N (%)**
Satisfaction with cleaning work			
Satisfied	79 (77.5)	23 (22.5)	102 (100.0)
Not satisfied	36 (76.6)	11 (23.4)	47 (100.0)
$\chi^2 = 0.013$, df = 1 p = 0.908			
How would you describe yourself in terms of your work load?			
Overworked	45 (81.8)	10 (18.2)	55 (100.0)
Not overworked	70 (74.5)	24 (25.5)	94 (100.0)
$\chi^2 = 1.064$, df = 1 p = 0.302			
Do you receive help from Co-workers?			
Yes	62 (75.6)	20 (24.4)	82 (100.0)
No	53 (79.1)	14 (20.9)	67 (100.0)
$\chi^2 = 0.256$, df = 1 p = 0.613			
Pressure to complete work			
Yes	72 (80.0)	18 (20.0)	90 (100.0)
No	43 (72.9)	16 (27.1)	59 (100.0)
$\chi^2 = 1.025$, df = 1 p = 0.311			
Rest in between work			
Yes	70 (79.5)	18 (20.5)	88 (100.0)
No	45 (73.8)	16 (26.2)	61 (100.0)
$\chi^2 = 0.682$, df = 1 p = 0.409			
Number of hours of daily work			
< 8 hours	72 (72.0)	28 (28.0)	100 (100.0)
≥8 hours	43 (87.8)	6 (12.2)	49 (100.0)
$\chi^2 = 4.635$, df = 1 p = 0.031*			
How long have been in cleaning job?			
< 1 year	88 (77.2)	26 (22.8)	114 (100.0)
≥1 year	27 (77.1)	8 (22.9)	35 (100.0)
$\chi^2 = 0.000$, df = 1 p = 0.995			
Sweeping posture			
Bent-over posture with traditional broom	8 (72.7)	3 (27.3)	11 (100.0)
Lean-over posture with traditional broom	41 (75.9)	13 (24.1)	54 (100.0)
Stand erect with broom-stick	66 (78.6)	18 (21.4)	84 (100.0)
$\chi^2 = 0.264$, df = 2 p = 0.876			
Mopping posture			
Lean forward with mopping-stick	17 (77.3)	5 (22.7)	22 (100.0)
Stand erect with mopping-stick	63 (76.8)	19 (23.2)	82 (100.0)
No response	35 (77.8)	10 (22.2)	45 (100.0)
$\chi^2 = 0.015$, df = 2 p = 0.993			
Posture adopted during other cleaning process			
Standing	73 (76.0)	23 (24.0)	96 (100.0)
Stooping	22 (73.3)	8 (26.7)	30 (100.0)
Squatting	20 (87.0)	3 (13.0)	23 (100.0)
$\chi^2 = 1.571$, df = 2 p = 0.456			

*Significant at 5% level of significance

Table 4: Logistic regression analysis for factors significantly associated with LBP

	β	Wald	p	Odds Ratio	95% C.I. for OR	
					Lower	Upper
Working >8hours daily	0.675	1.509	0.219	1.964	0.669	5.768
Had < 9 years of education	-0.667	2.292	0.130	0.513	0.216	1.217
Living below the poverty line	-0.555	1.541	0.214	0.574	0.239	1.379
Currently being in marriage	-0.901	2.240	0.135	0.406	0.125	1.322
Constant	1.712	3.125	0.077	5.539		