Prevalence of low back pain and associated risk factors among nurses in National Hospital, Abuja, Nigeria

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Abstract

Objective: The objective of this study was to determine the prevalence and associated risk factors of Low Back Pain (LBP) among nurses in National Hospital, Abuja, Nigeria.

Design: A cross-sectional study.

Methods: The study was carried out to determine the prevalence and risk factors for LBP among nurses in National Hospital, Abuja, Nigeria. A department-to-department enquiry was conducted using a self-structured questionnaire.

Results: Two hundred and seventy three respondents who included 30 (11.0%) males and 243 (89.0%) females participated in the study. The mean age was 37.4±8.0 (37.8±7.5 years among the males and 37.4±8.1 years among the females. Results showed that 193 (70.7%) respondents were either overweight or obese and only 69 (25.3%) were of normal weight. The 12 month prevalence of low back pain was 72.1%. About 179 (80.0%) of the nurses attributed their low back pain to work related issues. The incidence of LBP was more among female nurses (129, 53.1%) than the male nurses (13, 43.3%).

Conclusion: Occupational exposure to factors constituting physical loads (frequently carrying patients, availability of porters) and a previous history of back trauma were significant independent predictors of low back pain among nurses. However, LBP was not a major cause of absenteeism from work.

Key words: Low back pain, Risk factors, Prevalence, Nurses

Introduction

Low back pain is a ubiquitous health problem. It represents the most frequent disorder of mankind after the common cold[1,2]. Low Back Pain (LBP), perhaps more accurately called lumbago or lumbosacral pain, occurs below the 12th rib and above the gluteal folds[3].

Nurses are among the occupational groups within the health service that are vulnerable to LBP[4]. Many risk factors described for back pain involve occupational or psychological characteristics. Occupational factors include jobs that require lifting beyond the worker's physical capabilities, or in a compromised position. Workers involved in heavy duty labour who are over 45 years have 2.5 times greater risk of absence from work secondary to back pain than workers aged 24 years or younger[5].

A number of psychological conditions have been associated with back pain. Neurosis, hysteria and conversion reaction are however more frequently associated with acute back pain than depression[6]. Cigarette smoking is associated with an increased risk of back pain, although the data are inconsistent[7]. Although obesity is a minor factor in the causation of back pain, excessive weight facilitates perpetuation of back pain episodes[8]. About 90% of patients with back pain have a mechanical reason for their pains[9]. The remaining 10% of adults with back pain have the symptom as a manifestation of a systemic illness[10].

In the light of the increased prevalence of low back pain among nurses, the objective of this study was to determine the prevalence and risk factors of low back pain in nurses working in National Hospital, Abuja in Nigeria.

Materials and methods

The study was a cross-sectional survey conducted among consenting nurses at the National Hospital, Abuja, North-Central Nigeria. The hospital has in its employment over 663 registered nurses. The instrument for data collection was a self-structured questionnaire. A department to department administration

of the questionnaire was adopted. The questionnaire was administered to consenting nurses and either self-completed or interviewer assisted.

The sample size was calculated based on the formula by Yamane[11] where n= N/1 + N (e)2
Where n is the sample size, N is the population size, and e is the level of precision. A 95% confidence level and P = 0.05 are assumed. The total number of nurses in the hospital is about 636.

n= 636/1 +636 (.05)2   n= 246.

Nurses who did not consent were excluded from the study.

The following information was obtained: length of service, age, sex, smoking history, presence, frequency, severity of low back pain in the last 12 months, duration of absenteeism due to low back pain, intervention adopted by those with back pain, previous trauma or low back surgery, family history of low back, frequency of manually lifting patients, a qualification of stress at work and quality of life.

Statistical analysis: All data obtained was analyzed using Statistical Package for Social Sciences, IBM SPSS statistics® 2012 version 20.0 for windows by IBM USA, Amork, NY 10504. All categorical variables were summarized as frequencies and percentages. Pearson's Chi square test was used to determine the association between incident LBP and each of the studied characteristics of the nurses. LBP-associated factors were entered into a logistic regression model to determine the independent predictors of LBP. Variables that achieved statistical significance were kept in the model. Goodness-of-fit was assessed with the Hosmer-Lemeshow test and improvement by the final model of the explained variability by Nagelkerke's R^2. The limit of statistical significance was set at p-values 0.05.

Results

Over 300 questionnaires were sent out. The reasons given for non-participation include; not having time to fill them, others filled but misplaced them; some left to go on "off" shifts or leave and so we were unable to trace them while some gave no reason at all. Hence most of the questionnaires were investigator-assisted.

A total of 273 nurses participated in the study out of which the males were 30 (11.0%) while the females were 243 (89.0%) giving a male-female ratio of about 1:9. The mean age was 37.4±8.0 (37.8±7.5 years among the males and 37.4±8.1 years among the females). The mean length of service was 12.9±8.5 years. Seven (2.6%) of them did not disclose their cadres. As shown in Table 1, 193 (70.7%) respondents were either overweight or obese and only 69 (25.3%) were of normal weight.

Table 1: Characteristics of respondents

	Frequency	(%)
Sex		
Male	30	11.0
Female	243	89.0
Age group (years)		
30 or less	56	20.5
31 - 40	143	52.4
41 - 50	49	18.0
51 - 60	25	9.2
BMI		
Underweight	11	4.0
Normal weight	69	25.3
Overweight	94	34.4
Obese	99	36.3
Smoking		
Ever smoked	2	0.7
Never smoked	271	99.3
Number of children		
0	37	13.6
1	50	18.3
2	51	18.7
3	52	19.0
4	32	11.7
5	7	2.6
6	4	1.5
7	1	0.4
Undeclared	39	14.3

Table 2 shows the characteristics of the nurses' job. Sufficient job enjoyment is admitted by 187 (68.8%) women while 7 (2.6%) of them have never enjoyed their jobs. Manual carrying of patients on the bed is frequently performed by 114 (42.2%) nurses and carrying patients between bed and chair is frequently done by 114 (42.2%) while 46 (16.9%) have to lift patients from the floor on a frequent basis. Conversely, only 35 (13.0%) of nurses have appropriate lifting equipment available to them to use and only 113 (41.5%) have been previously educated on back care hygiene.

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Table 2: Characteristics of respondents' job

|	Frequency	(%)
Length of service (years)		
Less than 5	31	11.4
5 - 9	93	34.1
10 - 14	56	20.5
15 - 19	34	12.5
≥20	59	21.6
Ward or unit		
Medical	43	16.2
Surgical	37	13.9
Theatre	11	4.1
Paediatric	20	7.5
Labour	17	6.4
Intensive care	25	9.4
Others	113	42.5
Enjoyment of job		
Always	187	68.8
Occasionally	78	28.7
Never	7	2.6
Manually moving patients on the bed		
Frequently	114	42.2
Occasionally	138	51.1
Never	18	6.7
Carrying patients between bed and chair		
Frequently	114	42.2
Occasionally	138	51.1
Never	18	6.7
Lifting patients from the floor		
Frequently	46	16.9
Occasionally	145	53.3
Never	81	29.8
Availability of lifting equipment		
Yes	35	13.0
No	235	87.0
Availability of porters to help lift patients and equipment		
Yes	43	15.9
No	227	84.1
Stress experienced at work		
None	6	2.2
Insignificant	15	5.5
Significant	250	92.3
Previously educated on back care hygiene		
Yes	113	41.5
No	159	58.5

The prevalence of current LBP is 52% as reported by 142 nurses (Table 3). Among these individuals, the symptom had been on for between 6 and 12 weeks in 17 (12%) and for longer than 12 weeks in 86 (60.5%). A quarter of the respondents with current LBP had taken time of work before due to LBP. One hundred and seventy nine (79.9%) sufferers of LBP believe their pain was caused by the nature of their job. As shown in Figure I, self-medication is the top type of intervention adopted by the sufferers of LBP as reported by 164 (61.7%) nurses while 2 (0.7%) of them have had surgeries.

Table 3: Low back pain and its characteristics among respondents

	Frequency	(%)
Current LBP		
Yes	142	52.0
No	131	48.0
Duration of LBP (weeks)		
Less than 6	39	27.5
6 - 12	17	12.0
Longer than 12	86	60.5
LBP in the last 12 months		
Yes	196	72.1
No	76	27.9
LBP in the last 6 months		
Yes	150	55.0
No	123	45.0
Severity of pain experienced		
Mild	54	26.1
Moderate	121	58.5
Severe	32	15.5
Previous work absenteeism due to LBP		
Yes	60	25.4
No	176	74.6
Number of days of absence from work due to LBP		
1 - 3 days	32	55.2
4 - 7 days	19	32.8
>1 week	7	12.0
Activity limitation due to LBP		
None	71	31.7
Difficulty in walking	44	19.6
Unable to stand for long	65	29.0
Difficulty lifting patients	44	19.6
Self-described quality of life		
Poor	2	0.7
Average	80	29.5
Good	117	43.2
Very good	40	14.8
Excellent	32	11.8
Believed cause of LBP		
Work related	179	79.9
Trauma	7	3.1
Others	20	8.9
Not known	18	8.0

Figure 1: Interventions adopted for low back pain
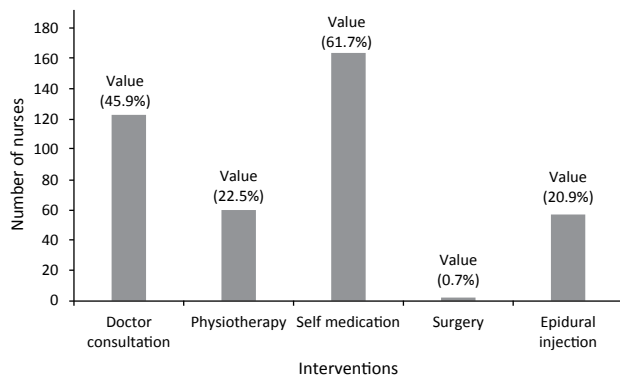
The factors associated with LBP are shown in Table 4. Statistically significant association was found between LBP and history of previous low back trauma (p=0.001), manually moving patients on the bed (p=0.029), carrying patients between bed and chair (p=0.012), no access to lifting equipment (p=0.026) and no access to porters to help lift patients and equipment (p=0.002).

Table 4: Factors associated with low back pain

	LBP		Total n (%)	P value
	Present n (%)	Absent n (%)		
Sex				
Male	13 (43.3)	17 (56.7)	30 (100)	0.312
Female	129 (53.1)	114 (46.9)	243 (100)	
BMI				
Underweight	4 (44.4)	5 (55.6)	9 (100)	0.650
Normal weight	30 (49.2)	31 (50.8)	61 (100)	
Overweight	42 (51.2)	40 (48.8)	82 (100)	
Obese	50 (58.1)	36 (41.9)	86 (100)	
Age group (years)				
30 or less	22 (42.3)	30 (57.7)	52 (100)	0.368
31 - 40	72 (54.1)	61 (45.9)	133 (100)	
41 - 50	26 (57.8)	19 (42.2)	45 (100)	
51 - 60	10 (45.5)	12 (54.5)	22 (100)	
No. of children				
≤2	74 (53.6)	64 (46.4)	138 (100)	0.811
>2	53 (55.2)	43 (44.8)	96 (100)	
Length of service (years)				
<5	11 (35.5)	20 (64.5)	31 (100)	0.061
5 - 9	46 (49.5)	47 (50.5)	93 (100)	
10 - 14	28 (50.0)	28 (50.0)	56 (100)	
15 - 19	24 (70.6)	10 (29.4)	34 (100)	
≥20	33 (55.9)	26 (44.1)	59 (100)	
History of low back trauma				
Positive	30 (76.9)	9 (23.1)	39 (100)	0.001
Negative	111 (48.1)	120 (51.9)	231 (100)	
Family history of LBP				
Positive	26 (53.1)	23 (46.9)	49 (100)	0.897
Negative	115 (52.0)	106 (48.0)	221 (100)	
Enjoyment of job				
Always	94 (50.3)	93 (49.7)	187 (100)	0.480
Occasionally	45 (57.7)	33 (42.3)	78 (100)	
Never	3 (42.9)	4 (57.1)	7 (100)	
Manually moving patients on the bed				
Frequently	87 (59.2)	60 (40.8)	147 (100)	0.029
Occasionally	46 (43.8)	59 (56.2)	105 (100)	
Never	7 (38.9)	11 (61.1)	18 (100)	

Carrying patients between bed and chair				
Frequently	71 (62.3)	43 (37.7)	114 (100)	0.012
Occasionally	62 (44.9)	76 (55.1)	138 (100)	
Never	7 (38.9)	11 (61.1)	18 (100)	
Lifting patients from the floor				
Frequently	29 (63.0)	17 (37.0)	46 (100)	0.245
Occasionally	74 (51.0)	71 (49.0)	145 (100)	
Never	39 (48.1)	42 (51.9)	81 (100)	
Availability of lifting equipment				
Yes	12 (34.3)	23 (65.7)	35 (100)	0.026
No	128 (54.5)	107 (45.5)	235 (100)	
Availability of porters to help lift patients and equipment				
Yes	13 (30.2)	30 (69.8)	43 (100)	0.002
No	127 (55.9)	100 (44.1)	227 (100)	
Stress experienced at work				
None	2 (33.3)	4 (66.7)	6 (100)	0.216
Insignificant	5 (33.3)	10 (66.7)	15 (100)	
Significant	133 (53.2)	117 (46.8)	250 (100)	
Previously educated on back care hygiene				
Yes	53 (46.9)	60 (53.1)	113 (100)	0.170
No	88 (55.3)	71 (44.7)	159 (100)	

Predictors of LBP: Multivariate analysis was performed to determine the independent effects of frequently carrying patients, availability of lifting equipment, availability of porters and a previous history of back trauma on the presence of LBP as the dependent variable. As shown in Table 5, frequently carrying patients, availability of porters and a previous history of back trauma remained significant independent predictors of LBP in the model. The logistic regression model was statistically significant (n^2=29.580, $p<0.001$). The model explained 14.0% (Nagelkerke R^2) of the variance in LBP and correctly classified 64.0% of cases.

Table 5: Multiple logistic regression model of predictors of low back pain

	AOR	CI	P value
Frequently carrying patients	0.507	0.303-0.847	0.010
Lack of lifting equipment	1.500	0.665-3.386	0.329
No access to porters	2.809	1.305-6.045	0.008
History of back trauma	0.244	0.105-0.568	0.001
Constant	0.250		0.228

AOR=Adjusted Odds Ratio, CI=Confidence Interval

Discussion

This cross-sectional study examined the point prevalence as well as the 6-month and 12-month prevalence of LBP among nurses. We explored the pattern of care obtained and the determinants of LBP. The often high incidence of LBP and its occupational relevance sometimes necessitate modifications in job structure or modes of execution. Nurses constitute the largest category of healthcare workers and their duties tend to include procedures that constitute incontrovertible mechanical tests on the integrity of the spine. Job-related LBP is the basis for several workers' compensation claims across the globe but this pattern has not necessarily been replicated in the developing countries of Africa where limits of weight allowed for different categories of workers to carry are either non-existent or poorly enforced. LBP is a very common and frequently recurrent condition which has been associated with mechanical injuries in addition to a host of psychological and social factors[12,13].

The study found that 52% of nurses were currently having LBP at the time of the study while 72% had had LBP in the preceding 12 months. This is similar to the findings of Sikiru *et al*[14] who found a 12-month prevalence of 73.5% among nurses in a specialist hospital in the

North-Western Nigeria. An overall 12-month prevalence of 70.8% was also reported among nurses across two African countries[15]. Conversely, Ovayolu et al[16] found a prevalence of 84.2% from a study of nurses in the Turkish province of Gaziantep. However, the nurses they studied worked in the intensive care units of 3 private and 3 public hospitals and their case definition of LBP referred to any form of discomfort (not just pain) felt between the lower costal margins and the gluteal folds. Like most forms of pain, there is remarkable variance in the perception and impacts of LBP among people. Overall, we found a prevalence of previous work absenteeism on account of LBP to be 25.4%, a figure close to the 27.8% reported by Mesas et al[17] among Spanish workers. The earlier Nigerian study of LBP among nurses however found that 35.7% of respondents had taken days off duty due to LBP[14]. They observed that the largest number of nurses studied, nurses with LBP and nurses reporting LBP-linked absenteeism worked in the obstetrics and gynaecology department. On the contrary, only 6% of nurses in the present study worked in obstetrics and gynaecology. Hence, if there is a significant contribution to the risk of LBP and absenteeism by virtue of the ward of service, this disparity may account for the difference in the reported rates of absenteeism between the two studies.

LBP is one of the most common reasons patients consult doctors in the outpatient clinics. While almost half of our respondents have seen a doctor for LBP, self-medication tends to be the leading choice of intervention. Granted, working in the hospital confers the advantage of relatively easy access to doctors to whom nurses may readily complain, the proportion of nurses (one fifth) who have had epidural injection for LBP may be much higher than the proportion of sufferers of LBP in the general population who have had the same treatment. In Nigeria, LBP is one of the most popular complaints for which people take various herbal and alternative medications. Many of these remedies are not controlled and the pervasiveness of LBP may have successfully persuaded some of the nurses who admitted to self-medication to have also tried unorthodox therapies.

A diversity of associations is known between LBP and various work-related and personal characteristics of patients[18,19]. We observed that the practice of carrying patients and the unavailability of lifting equipment or porters are linked with the presence of LBP. This agrees with the recent report of Omoke et al[19] who found that lifting heavy objects is a common factor associated with LBP. Similarly, in a study of LBP among industrial workers, Murtezani et al[20] showed that certain work-related postural factors have strong associations with LBP. This was affirmed for repeated trunk flexion, a posture that often accompanies the process of lifting patients. Whereas the transmitted force of the carried weight may be the mechanical stress associated with LBP and weight lifting, the frequency of flexion or rotatory truncal movement may equally be as important. Among workers in their first employment, Van Nieuwenhuyse et al[21] reported that more than 12 flexions or rotations of the trunk per hour confers a relative risk of 3.0 for first-ever LBP. So if unavailability of porters is associated with LBP in the nurses who are possibly doing more heavy liftings than is healthy for their backs, then reduction in incidence of LBP among nurses by employing more porters will probably mean more LBP among porters unless effective measures are taken to limit the weight carried by single persons and encourage safe shared weight lifting.

Notably, while the availability of lifting equipment fell short, multivariate analysis showed that frequently carrying patients, availability of porters and history of back trauma all retained their significance. Loading the back and awkward postures compelled by work demands and the perceived job requirement for putting the back under stress have been reported to constitute risk factors for LBP[22]. A disconcerting 37% of global burden of LBP is attributable to occupation and this burden of occupation-related LBP is believed to be more common among men who generally engage in more physical jobs that may directly constitute mechanical hazards to their backs[23]. However, nursing is a female-predominant profession and invariably, the sheer number of sufferers of work-related LBP among nurses will be more among the women.

Ergonomic evaluation of nursing duties may be increasingly necessary as various reports have documented that nurses with LBP largely believe the aetiology of their pain is work related[14,24]. This was true for 80% of the nurses in our study. For this reason, participatory ergonomics as well as physical training have been recommended for reducing the morbidity associated with work-related LBP[25]. As part of measures for protecting workers' health, the World Health Organization recognizes the high potential for LBP if a safe balance is not reached between the functional capacity and physical labour at the place of work[26]. While the aspects of nursing duties assessed in this study were limited to physical roles of moving patients, the wide range of psychosocial sides

of work and family life that may have roles to play in perpetuating the pain was not detailed. These are known to exert definite effects on the overall prevalence of LBP and possibly work absenteeism.

In conclusion, occupational exposure to factors constituting physical loads on the back and previous injury to the back are important predictors of incident back pain among nurses. The possibility of sharing the burden, such that reduced weight and consequently ergonomic stressors, born by a nurse may lead to lowering the risk of LBP. To achieve this, the provision of porters and adjustments of patient-carrying duties to reduce the risk of LBP may indeed be beneficial for the overall health of the nurse.

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