

Relationship Between Low Back Pain And Work-Place Functioning Of Nurses At A Tertiary Hospital In North Central Nigeria

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Abstract

Objectives: This study was aimed at determining the prevalence of low back pain (LBP) among nurses and the relationship between LBP and work place performance, as measured by the Work Ability Index (WAI), of nurses at a tertiary hospital.

Materials and Methods: A cross-sectional, hospital based study was carried out with structured questionnaires administered to 204 randomly selected, eligible, consenting nurses between August-November 2011. The questionnaires sought socio-demographic data and the Work Ability Index (WAI).

Results: Results were analysed with Epi info version 3.3.2 statistical software. The prevalence of low back pain among nurses was 70.1%. Nurses without low back pain had better WAI score than nurses with back pain (Mean WAI score: 43.6 ± 4.55 vs 41.2 ± 4.65 , $p = 0.0007$). The duration of low back pain was inversely related to the mean WAI scores ($r = -0.84$, $p = 0.0004$). The regression relationship derived showed that for every unit change in the duration of low back pain, the mean WAI changed by 6.45 units ($y = 39.78 + 6.453x$; $R^2 = 0.761$). The duration of LBP accounted for 76% of variability in the mean WAI score.

Conclusion: Physicians attending to hospital staff in outpatient departments need to be aware of the high prevalence of low back pain among nurses and the negative impact on their workplace performance.

INTRODUCTION:

The term low back pain (LBP) refers to pain in the lumbosacral region of the spine, encompassing the distance between the first lumbar vertebra to the first sacral vertebra. This is the area of the spine that constitutes the lordotic curve.^[1] Mechanical low back pain (LBP) is generally attributed to an acute traumatic event, but cumulative trauma is also an aetiological factor.^[2] Mechanical LBP due to cumulative trauma tends to occur more commonly in the workplace.

Work related musculoskeletal disorders like LBP, poses a major health and socioeconomic problem in modern society. Work also has a major impact on outcome of LBP. In a cohort study on patients consulting for the first time regarding episodes of LBP, the perception of workload was a better predictor of long-term outcome of LBP.^[3]

Compared to other occupations, nursing personnel are at

higher risk for musculoskeletal disorders. In the United States of America, nursing aides, orderlies and attendants ranked second and registered nurses sixth in a list of at-risk occupations for strains and sprains that included truck drivers (first), labourers (third) and construction workers (seventh).^[4] In the hospital environment in United Kingdom, nurses are known to be a high risk group because of patient lifting and other postural requirements of their job.^[5,6]

Work place performance can be measured using the Work Ability Index (WAI) Questionnaire. The concept of work ability can be defined as the ability of a worker to perform his/her job, taking into account the specific work demands, individual health condition and mental resources.^[7] In the last decade, the WAI questionnaire has been widely used in scientific studies on occupational health. WAI results at group levels are used as primary outcome variables in different epidemiological studies to identify occupational and personal risk factors for poor work ability.^[8,9]

Professional Nursing work is characterized by physical activity involving constant motion inside the ward and hospital.^[10,11] Nurses are required to lift and transport patients or equipment, often in difficult environment particularly in Africa where lifting aids are not always available or practicable.^[12]

A higher prevalence of LBP has often been shown among health care workers when compared to other hospital and industrial workers. Several authors in industrialized nations report annual prevalence of LBP in nurses varying from 73%-76%.^[6,7,13] A study carried out in a rural hospital in Southern Nigeria revealed a prevalence rate of 69% among nurses.^[14] The impact of LBP on the nursing work force may result in adverse consequences at the organizational level as well as through increased absenteeism, lost work time, burn out, decreased retention, high turnover, and threatened recruitment.^[15]

The implication of this disabling injury includes serious financial burden on healthcare organizations, increase in the cost of back pain treatment, surgery as a result of back pain, increase in employer liability and loss of experienced nursing staff.^[16] Nursing has suffered severe brain drain like most other health professions in Nigeria in recent years. Many nurses have immigrated to Europe, Canada and the oil rich middle-east countries in search of better life and conditions of service. This has contributed to inadequate staffing and increased risk of LBP among nurses.^[17-19] Since nurses are already at risk for LBP, a reduction in professional nursing staff and other changes in nursing care delivery are likely to lead to even higher rates of LBP.^[20]

In developed countries, there are regulations which define limitations regarding execution of jobs connected to physical effort and transporting heavy materials and constrained body position.^[21] In America, the Association of Occupational Health Professionals in Healthcare (AOHP) supports actions, policies and laws that will help to establish a safer environment of care for nurses and patients as it relates to safer patient handling and prevention of injuries.^[22]

This study is aimed at determining the prevalence of low back pain and the relationship between LBP and the performance of nurses in the workplace. With this study, awareness on the health needs of nurses in relation to back pain and their performance will be created which will help to develop regulations that will protect the interest of nurses at the work place.

METHODS:

This study was carried out at a tertiary hospital in North Central Nigeria. Ethical approval was obtained from the Health Research Ethics committee of the Hospital. A cross-sectional, comparative, hospital-based design was used for this study with 204 respondents. A semi-structured questionnaire was validated by a jury of experts involved in the management of back pain namely an orthopaedic surgeon, a family physician, a nurse and a physiotherapist. The semi-structured pre-tested questionnaires were administered to eligible nurses by the researcher. The questionnaire sought information on socio-demographic data, Work Ability Index (WAI) with the WAI questionnaire.

The, weight, height and body mass index were also evaluated. The weight of each participant was determined using a standard Camry model analogue bathroom weighing scale. This was standardized with a 2kg sand bag. Weights were taken to the nearest 0.1 kg in light clothing without any other accessories. The weighing scale was adjusted for 'zero error' before each respondent was weighed and parallax error was also avoided when reading the values for each respondent. Standing height of study subjects was measured with a Seca model stadiometer mounted on a wall, with subjects facing forwards, without headgear or footwear and measured to the nearest 0.1 centimetre. It was ensured that participant's heels touched the wall and that the height of the hairdo was excluded from the measurement. The Body Mass Index (BMI) of each participant was determined using the formula: $BMI = W(Kg)/H(m)$

Where W=Weight in kilograms; H=Height in metres.

A value of less than 18.5kg/m² is underweight, 18.5-24.99kg/m² is appropriate weight, 25-29.99kg/m² is overweight, 30-34.99kg/m² is grade I obesity, 35-39.99Kg/m² is grade II obesity and greater than or equal to 40kg/m² is grade III obesity or morbid obesity.^[23]

Work ability was assessed with the modified version of the Work Ability Index (WAI) questionnaire. The WAI questionnaire is a self-administered questionnaire which consists of seven items on (1) subjective estimation of current work ability compared with life time best, (2) subjective work ability in relation to the physical and mental demands of work, (3) number of diagnosed diseases, (4) subjective estimation of work impairment due to diseases, (5) sickness absenteeism during the past year, (6) own

prognosis of work ability after 2 years, and (7) psychological resources (enjoying daily tasks, activity and life spirit, optimism about the future). The final index score ranges from 7-49, and is divided into four work ability categories as poor (7-27 points), moderate (28-36 points), good (37-43 points), and excellent (44-49 points). The participants marked a value for each question.^[24] The total score for each participant was collated by the researchers.

The data was analysed after it was entered into Epi info version 3.3.2 statistical software (CDC, Atlanta, Georgia, and U.S.A.). The prevalence of LBP was determined as a simple proportion of those with LBP out of the total number of nurses studied. Relationship between LBP and work-place functioning was assessed using both χ^2 and Fhi coefficient tests. A confidence interval of 95% was used in this study and a P value of less than 0.05 was considered significant.

RESULTS

The socio-demographic characteristics the respondents are shown in Table 1.

A total of 204 nurse respondents had valid questionnaires, 28(13.7%) males and 176(86.3%) females, their age ranged from 22 to 53 years with mean age of 42.8 ± 8.5 years.

Table 1

Socio-demographic characteristics of respondents

Variable	Frequency	Percent %
Gender		
Male	28	13.7
Female	176	86.3
Age (years)		
<30	23	11.3
30-40	53	26.0
41-50	86	42.2
>51	42	20.5
Marital status		
Single	31	15.2
Married	159	77.9
Widowed	14	6.9
Religion		
Christianity	196	96.1
Islam	8	3.9
Educational qualification		
* RN	19	9.3
**RNM	115	56.4
***OAQ	70	34.3
Nursing cadre		
CNO	68	33.3
ACNO	33	16.2
PNO	37	18.1
SNO	6	2.9
NO I	33	16.2
NO II	27	13.2
Years at work (years)		
<10	54	26.5
10-20	65	31.9
21-30	76	37.3
> 30	9	4.4
Engaging in Leisure activities		
No	51	25
Yes	153	75

* RN = Registered Nurse ** RNM = Registered Nurse/Midwife

***OAQ = other additional qualifications (B.Sc, Diploma etc)

Body Mass Index (BMI) of participants

Table 2 below indicates that the largest proportion of the respondents (53.4%) was overweight.

Table 2

Body Mass Index distribution of participants

BMI (kg/M ²)	No. of participants	Percent %
< 18.5 (Underweight)	1	0.5
18.5-24.99 (Normal)	39	19.0
25-29.99 (Overweight)	109	53.4
30.0-34.99 (Class I obesity)	42	20.5
35-39.99 (Class II obesity)	10	4.9
≥ 40 (Class III obesity)	3	1.7

Prevalence of low back pain among nurses

The overall prevalence of low back pain was 70.1% with confidence limit of 62.8%-75.8%.

Work ability index and low back pain (LBP) in nurses

Results indicate that 41.7% (85) of the nurses had excellent work ability index scores; 45.0% (92) had good score; 12.3% (25) had moderate score, while 1% (2) had poor work ability index score. There was a significant difference in mean WAI score between nurses with LBP, 41.2±4.6 and those without LBP, 43.6±4.55 ($p = 0.0007$). Other details are in table 3 below:

Table 3

Work Ability Index score of participants

WAI score	No of participants	Percent %
44-49 (Excellent)	85	41.7
37-43(Good)	92	45.0
28-36 (Moderate)	25	12.3
7-27 (poor)	2	1.0
Total	204	100

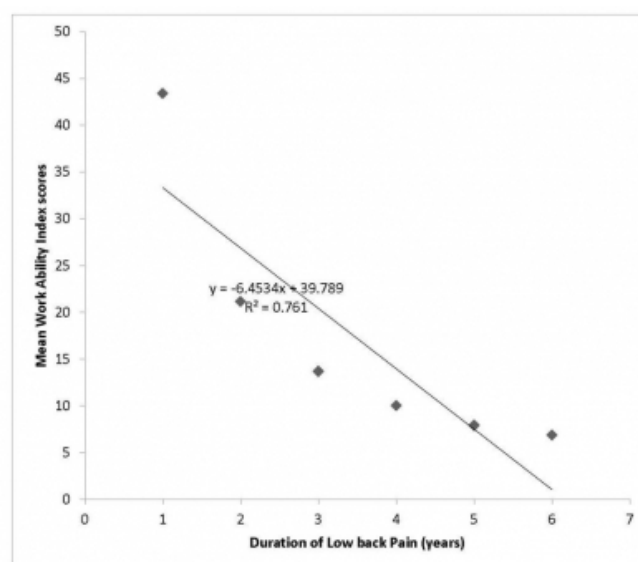
Relationship between duration of low back pain and mean work ability index (WAI) scores

The duration of LBP was inversely related to the mean WAI scores with the Pearson coefficient of correlation (r) of -0.84 , $p = 0.0004$. This relationship was further tested with regression analysis to attempt prediction of the mean WAI scores if the duration of low back pain is known. The regression relationship shown below revealed that for every

unit change in the duration of low back pain, the mean WAI changes by 6.45 units ($y = 39.78 + 6.453x$; $R^2 = 0.761$). Also, the duration of low back pain account for 76% of variability in the mean WAI score. Figure 1 shows the scatter plot of the result.

Figure 1

Scatter plot showing relationship between the duration of low back pain and mean Work Ability Index Score



DISCUSSION:

The hospital prevalence of LBP among nurses in this study was 70.1%. This is consistent with other studies which revealed life time prevalence rates of LBP of 80% in USA,^[9] 70.8% in Nigeria,^[12] 87% in Germany,^[25] 82.03% in Taiwan^[26] and 61% in Thailand.^[27] Several studies from China and Netherlands have reported slightly lower annual prevalence rates of LBP in nurses varying between 45% and 58%.^[8] Comparing these studies might be difficult as definitions of the term LBP vary considerably. Furthermore, the heterogeneity of different nursing populations could be responsible. The high prevalence rate of LBP among nurses has been attributed to numerous factors such as physical load and work posture; psychosocial factors such as personality and psychosomatic symptoms.^[28] These factors were most likely responsible for the high prevalence in our study. Fifty-three percent of the respondents were overweight. An additional, 20.5% had Class I Obesity and 4.9% had Class II Obesity. While not conclusive, studies have shown an increase in back pain in obese women.^[29] Individuals with BMI<30 are at minimal risk of developing low back pain, moderate risk in those with BMI>30, and BMI>40 indicates a higher risk.^[30] Overweight and obesity may have

contributed to back pain in the respondents.

The mean WAI of nurses with LBP was 41.2 while the mean WAI of nurses without LBP was 43.1. The study showed that, there was a significant difference in mean WAI scores of nurses with LBP and those without LBP. This result is consistent with studies of Italian nurses and the report of an International congress held in 2004.^[8,9] Since workers differ with regard to their capacities and demands of their work, their work ability is differently affected by a particular illness or limitation.^[31]

The relationship of LBP with workplace functioning can be complex. Individuals may experience impairment or disability at work because of LBP whether the latter was directly caused by job-related factors or not. The degree to which ability to work is impaired is often dependent on the physical demands of the job. Furthermore, when an individual experiences a LBP, it may be a new occurrence or an exacerbation of an existing condition. Again, originally it may have been directly caused by work or by non-work-related factors. Thus, the relationship between work functioning and LBP may be direct in some cases, but not in others.^[32]

CONCLUSION:

This study has unveiled a high prevalence (70.1%) of low back pain among nurses in a tertiary hospital in Jos, Nigeria. Nurses without LBP had a better WAI score than nurses with back pain, and the duration of low back pain accounted for 76% of variability in the mean WAI score.

In view of these findings, Physicians taking care of Nurses in staff clinics ought to be aware of the high prevalence and the negative effects on work place functioning. Hence, courses on back care ergonomics and patient transfer could assist in prevention, and hospital administrators should be informed to provide appropriate lifting equipment.

TAKE HOME MESSAGE

Low back pain is a common musculoskeletal injury among nurses in Nigerian hospitals

Nurses with Low Back Pain are more likely to have reduced work performance.

The longer the duration of Low Back pain among nurses, the higher the loss in work performance.

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