The Incidence of Low Back Pain among Theatre Nurses: A Case Study of University of Ilorin and Obafemi Awolowo University Teaching Hospital

Christiana D. Hinmikaiye[1], Eunice I. Bamishaiye[2,*]

[1]Nursing department, perioperating unit, University, Ilorin, Nigeria
[2]Biochemistry units, Nigerian Stored Products Research Institute, Kano, Nigeria

Abstract   Studies have shown that low back pain is common and accounts for a large number of reported disabilities among nurses who also happen to have one of the highest levels of back injury in all occupation groups. The aim of the current study was to determine the incidences of low back pain among theatre nurses in university of Ilorin and Obafemi Awolowo university Teaching hospitals. A structured questionnaire was the tool of data collection. The study population and sample included all theatre nurses in all the theatre related sections. A total of 80 nurses participated in the study. The first set requested socio-demographic data, followed by the Nordic Musculoskeletal Disorder Questionnaire which examined low back pain prevalence. A response rate of 91% was obtained. Descriptive statistics were employed to summarize the demographic data of the study sample, which were presented using frequency tables and expressed as percentages, means and standard deviations. 57 (78.1%) respondents experienced the first episode of back pain after commencing nursing, more females (70%) than males (30%) were employed. It can be seen that about 44 out of 57 subjects who had experienced back pain in their career experienced it at least once a month or more frequently. 64.91% subjects rated their pain as moderate pain. The largest single category was 'low back', with 77.19% of the 57 analyzable responses. 34 respondents said they Lift patient within bed without assistance. The high incidence of back pain is brought about by factors which seem to be entirely preventable. It is apparent that nurses are taking risks or are pursuing questionable practices. It was therefore concluded that the prevalence rate of 78.1% is high and efforts should be made by the nurses, ministry of health and the country at large on how to reduce the prevalence rate.

Keywords   Nurse, Pain, Back, Operating Room

1. Introduction

International Association for the Study of Pain defined pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. It is a major symptom in many medical conditions, and can significantly interfere with a person's quality of life and general functioning [1].

An operating room nurse also known as theatre nurse or a perioperative nurse is a healthcare worker who is a professionally registered nurse that assists the surgeon and the surgical team in their tasks. They are responsible for the supply of all of the surgical needs and for keeping of inventory of all of the various items that were used during the operation. They also tend to the health and care of the patient in the operating room, oversee the work organization within the operating theatre, and mediate between the various hospitals, departments, the surgeons, and the management [2].

In the past decades, there has been increasing interest in occupational health issues relating to musculoskeletal system. One of these is low back pain (LBP), a phenomenon with particularly high prevalence all over the world[3-4]. Low back pain is not only considered to be the most common reason for functional disability, worldwide, but also estimated to affect almost 90% of the universal population[5]. Moreover, low back pain is said to be among the leading musculoskeletal disorders that predominantly affect the working population in developed as well as in developing countries[6].

Jansen J., Burdorf A. and Steyerberg E., (2001)[7] reported that LBP is a social problem due to the negative impact in daily/professional life, cost and mental/physical health. Researchers report that 65-80% of general population will have at least one LBP incident during adulthood[8].

According to the results of studies carried out in the United States, lower back pain is the most frequent reason

for temporary disability among the population at large in the age group under 45, and in persons aged 45-56, it is the third most frequent reason leading to the restriction of physical activity of individuals having suffered heart trouble and rheumatic diseases[9].

Nurses, as professionals, have serious incidents of occupational LBP and traumas in the lumbar area, as their profession is unique with heavy emotional and physical work, and are exposed to a combination of mechanical and psychosocial stress at work[10-11]. Working positions often are uncomfortable either due to lack of space or movement restriction caused by special circumstances, such as in dialysis unit, operating theatre, intensive care unit. It has been found that nurses have to walk and stand up during their shift more than warehouse workers a lot of times more than 6 hours a day[12].

Seventy two percent (72%) of Korean hospital nurses experienced low back pain and nurses who reported manual handling of patients were 7,2 times more likely to report musculoskeletal symptoms[13]. The prevalence of back disorders among nursing staff was found to be 36% and 63% in the Netherlands and Cape Town (South Africa) respectively[14].[15] found that physical variables which seem to elicit symptoms of low back pain in subjects the most, were lifting (65%), and working in awkward postures (47%), stooping (34%) and poor ergonomic layout of the ward (53%).[16] also found out that the prevalence of low back pain was 87% in ICU nurses and 64% in nurses working in other wards in a Chinese hospital study involving 4 077 employees. The compressive force on the disc between the L5 and S1 vertebrae was calculated with Bless Pro software and was seen to be the highest during observation of drainage, lifting and transferring of patients in bed, injection and suctioning[16]. In Greece, in a study carried out by[17] with 407 female nurses at a major Athens hospital, the researchers showed that prevalence was 63% and 67% for time periods of two weeks and six months respectively

Several high risk activities have been identified for nurses in the hospital especially in relation to low back pain. The most important factor related to work load is rapid movement combined with poor body posture especially when nurses perform their duties under time pressure. Time pressure activities include emergency nursing care, operating rooms, unplanned or unexpected work within hospital units. It is generally accepted that nursing staff belong to the group of high-risk professions with regard to the occurrence of musculoskeletal injuries and Data on the prevalence of LBP among operating room nurses is not much and considering their significance in nursing system, more information and knowledge needs to be disseminated therefore the statement of the problem is to investigate into the causes, effects and incidence of lower back pain (LBP) among theater nurses in University of Ilorin and Obafemi Awolowo Teaching hospital.

2. Methodology

2.1. Study Area

The study was conducted at University of Ilorin Teaching Hospital (UITH) and Obafemi Awolowo University Teaching Hospital (OAUTH), Nigeria. The hospitals are one of the referral hospitals in Ilorin and Ile-Ife City respectively. The population for the study included all the operating room nurses of both University teaching hospitals.

2.2. Instrument

The instrument for the study is a simple rating structured questionnaire tagged 'Low back pain among theatre nurses. The first section of the questionnaire assessed the following socio-demographic characteristics of the nurses: gender, age, marital status and working experience while the second, the Nordic Musculoskeletal Disorder Questionnaire was completed to evaluate the prevalence of low back pain of the participant.

2.3. Administration of the Instrument

The study population and sample included all theater nurses in the main theater and accident and emergency unit. A total of 88 theater nurses are work in the two hospitals however, only 80 were considered for the study as 8 were on annual leave. All the 80 were willing to participate. Considering the ethical measures, participation in the study was voluntary so participants had a choice to be part of the study or refrain without giving any reason.

2.4. Data Analysis

Completed data was captured on a spreadsheet using the Word Excel programme in preparation for analysis. The data were recorded from question responses into meaningful prevalence variables. Double data entering was done to ensure data quality. Thereafter data was transferred into the Statistical Package for the Social Sciences (SPSS) version 17.0. Descriptive statistics was employed to summarize the demographic data of the study sample. The demographic data was presented using frequency tables and expressed as percentages, means and standard deviations.

3. Results and Discussion

A total of 88 questionnaires were distributed among theatre nurses from UITH AND OAUTH, and 80 were fully completed and returned, yielding a response rate of 91%. The reasons for non-participation in the study included not being available as a result of leave, absence from work and also refusal to participate.

Increasing age has been associated with an increase in musculoskeletal symptoms. However, it has been stated that low back pain usually begins in early life, with highest frequency of symptoms occurring in the age range of 35 to 55[18]. This is in agreement with this research work which shows that the theatre nurses who suffer LBP most (45%) are between age ranges of 41-50 as seen in Table 1. According

to[19], the prevalence of low back pain increases with age and[20] adds that economic productivity decreases with age. The vast majority of operating room nursing staff was female in this study (70%) as shown in Table 1 and low back pain in this occupational group was also much higher than the general point prevalence of low back pain found in this study.

Table 1. Socio- Demographic Factors and their Relationship to the Presence of Low Back Pain

Parameter	Frequency	Percentage
Age		
21-30 years	4	10
31-40 years	8	20
41-50 years	18	45
51-60 years	10	25
Gender		
Male	24	30
Female	56	70
Marital status		
Single	12	15
Married	58	72.5
Divorced	6	7.5
Widowed	2	2.5
Separated	2	2.5
Religion		
Christianity	56	70
Islam	24	30
Traditional worshipper	-	-
Year range		
1-5 years	5	6.25
6-11 years	15	18.75
12-17 years	17	21.25
18- 23 years	21	26.25
24-29 years	12	15
30-35 years	10	12.5

A study carried out to determine the prevalence and actors of low back pain among hospital staff in Tunisia, found that being a female nurse was significantly associated to low back pain occurrence[21]. Mwilila[22], in her study carried out in one of Tanzania's hospitals also reported that 83.6% of the total study population was made up of female nurses who also had the highest low back pain prevalence as compared to their male colleagues.

Table 2. Prevalence of back pain

Valid	Frequency	Percentage (%)
Yes	57	78.1
No	16	21.9
Total	73	100

The findings of this survey demonstrated a high prevalence of back pain as shown in Table 2 (78.1%) compared with other international findings which demonstrated a prevalence of back pain that ranged from 43% to 79% [23]. Several researches on back pain among nurses found prevalence of back pain varying between 45%-58%[24]. A study conducted among nurses from two selected hospitals in Nigeria and Ethiopia revealed one year low back pain prevalence of 71%[25]. Mwilila[22] also

reported a low back pain prevalence of 73.7% among nurses from one of Tanzania's major hospitals. Although these results are slightly lower than the current study results (78%), they may be comparable. In the same context, a survey conducted to determine the prevalence of occupational low back pain among hospital workers and the general population in one of Nigeria's districts, nurses reported a higher prevalence of low back pain (69%) over secretaries and administrative workers[26]. Similarly,[27] in their study carried out among nurses in Nigeria conclude that low back pain is common among health care workers, and nurses who make almost 33% of all hospital staff were found to have greater chances of work related injuries (60%).

Most respondents claimed the commonest site to develop back pain was at the lower back area 77.19% as shown in Table 3 below. This could be due to lumbar region received the highest pressure when a person manually lifting weight[28]

Table 3. Usual Site of Back Pain

	Total subjects	Yes (percent)	No (percent)
Upper back and neck	57	20 (35.09%)	37(64.91%)
Mid back	57	11(19.30%)	46(80.70%)
Low back	57	44(77.19%)	13(22.81%)
Buttocks and legs	57	12(21.05%)	45(78.95%)

When comparing theater nursing experience of '2 to less than 5 years', and 'above 8 years', the results showed an increase in the percentage of back pain from 29.83% to 47.37%(respectively) with an increase in working years as shown in Table 4. It is expected that this ratio would be low as experienced nurses are supposed to be more experienced in performing caring activities. It is still uncertain if the reason behind this finding is related to increased workload on Operating room nurses or other factors (aging, for example).

Table 4. Back Pain and Years of Experience in Nursing

	Frequency	Percentage (%)
Below 2 yrs	4	7.02
2 to less than 5 yrs	17	29.83
5 to 8 yrs	9	15.78
Above 8 yrs	27	47.37
Total	57	100

It can be seen that about 44 out of 57 subjects who had experienced back pain in their career experienced it at least once a month or more frequently as seen in Table 5 below. Frequent pain reduces work input which may have a negative effect on the personality of the staff and patients. Acute pain serves as a warning that something somewhere in the body is amiss and requires immediate attention, whereas chronic pain might never fully cease[29].

When pain lasts for 6 months or more in periodic or unremitting episodes, it can be defined as chronic in nature. This finding puts more light on the physical and

psychological impact of back pain on nurses in general. Depression usually accompanies chronic pain, and this has an adverse effect on the nurses' morale and job performance [29].

Table 5. Frequency of Back Pain

	Frequency	Percentage
Daily	8	14.04
Once a week	22	38.60
Once a month	14	24.56
A few times a year	10	17.54
once a year	3	5.26
Total	57	100

Findings regarding reporting back pain to the administrative body were also impressive. Only 61.76% of the respondents reported their back pain to senior administrative, which supports the common finding that nurses tend to ignore complaining of back pain[30].

The finding that 77.193% of the back pain sufferers were experiencing lower back pain is not surprising given that the lower back is the most susceptible site and they stand on their feet for a very long time. The lower lumbar discs, L4–L5 and L5–S1, are subject to the greatest mechanical stress, compression force and the greatest degenerative changes. These compression forces are generated by heavy physical work, manual lifting and prolonged static work posture. There is other evidence that inappropriate practices are taking place. Given that 'transferring the patient' was the top dynamic factor as seen in Table 6 contributing to the back pain and that 'lifting a heavy patient within the bed without assistance' came close second, there is some indication that suitable techniques for lifting and carrying are not being adopted in practice.

Table 6. Number of subjects who reported the following dynamic factors contributing to their back pain (n= 57)

Factors	Number of responses
Lifting patient within bed with assistance	28
Lifting patient within bed without assistance	34
Lifting patient from floor with assistance	29
Lifting patient from floor without assistance	21
Transferring patient (bed to chair; bed to bed)	40
Don't know	12

The second most common finding that 'lifting a patient without assistance' contributed to most nurses' back pain indicates that nurses are taking risks either necessarily or unnecessarily. If they are taking risks unnecessarily then they are guilty of neglect which puts themselves and the patient at risk of injury. If it is necessarily incurred because of staff shortages then the health service management is putting nurses and patients at risk of injury. Tissue resistant during manual heavy lifting differs between individual persons in whom it is not only related to weight of the load but also other factors such as the distance load being moved, load lifting technique and frequent weight lifting[31]. Theoretically, ability to handle weight and risk of injury depend on individual strength. It is related to acute effect of physical load in which pain occurs when the load exceeds the tissue resistant. Lifting weight exceeding person ability will increase the risk of back injury[32]. These findings agree with the review by[33] who described positive associations between lifting loads and bending.

Another explanation may be the possible ignorance with regards to kinetic handling and ergonomics during these nursing activities which includes lifting, stooping over patients and transferring patients[15-16].

Table 7. Number of subjects who reported the following effects caused by their back pain (n = 57)

Effect of back pain	Number of responses
Restriction of activity	49
Transfer to another position	29
Thinking to leave nursing	11
Taking many days off	26

Respondents reported the negative effect their work schedule is having on them, they were allowed to make multiple choices, forty nine reported that it makes them to restrict and limit their activities for the day and even have to take many days off as shown in Table 7. Some respondents suggested the need to increase staff numbers in order to reduce the workload of each individual. As many sufferers from low back pain complain about being overworked, this may offer some relief. Treatment of back pain remains unsatisfactory as indicated in Table 8. Seventeen percent of the respondents with back pain in this study took some rest to relieve their back pain while thirty six percent take analgesics.

Table 8. Management methods of low back pain

	Number of responses
I don't do anything	2
use of Painkillers	37
Rest	16
Use of back belt	-
Reduce movement at work	-
Reduce movements at home	4
Muscle relaxants	14
Exercise	1

Management of LBP with physiotherapy, chemotherapy and surgery has been well established[34] Acute back pain may not be relieved by bed rest while some studies have shown the positive effects of exercise[35] and continuous activity[36].

4. Conclusions

In conclusion, low back pain has been indicated to be the most prevalent occupation-relate problem across different

countries in both the developed and developing world. And, the results of the present study on low back pain among theatre nurses are higher (78%) but in line with other studies conducted in both developed and developing countries. Although prevalence of low back pain among nurses in Africa has not been widely explored, results of the few available studiesincluding the current results (78%) show that it is high. However, the researcher argues that although the prevalence of nurses' low back pain is comparable in both developed and underdeveloped countries, the working conditions in both settings might not be comparable.

Nurses in the developed world may be working under improved working conditions, which is most likely not the case under which nurses in most African countries practice. Therefore, nurses in Africa, particularly in Nigeria where the study was conducted, might be at higher risk of suffering low back pain than nurses in industrialized countries. This being due to the increased risk of work related injuries and thus reason for concern. The results of the current study will hopefully contribute to the scanty information available in Africa.

Nurses can be advised to do regular exercise to strengthen their back muscles, employer to ensure ergonomic adjustment to reduce risk of back pain such as manual handling, awkward body position at work and monotonous work posture. The high incidence of back pain is brought about by factors which seem to be entirely preventable. It is apparent that nurses are taking risks or are pursuing questionable practices.

In this situation, initial nurse education will never be sufficient and the most obvious course of action seems to be periodic and continuous in-service training. The costs of training or maybe updating and purchasing specialized equipments (lifts, back belts, electronic adjustable beds) are easily justifiable in terms of savings made by avoiding loss of nurses to the profession, absenteeism and potential danger to the patient.

Strength and weaknesses of the study
Strengths of the study

The strength of the study is that there was a high response rate of 91%. This shows that the nurses were most willing to contribute to the study. As for the rest of the nurses (9%) who declined to participate in the study, they attributed it to one of the ethical considerations that clearly stated that participation in the study was voluntary.

Weakness of the study

One of the weaknesses of this study was the small sample size, thus the findings could not be generalized to all the clinical nurses in Nigeria..

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