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Research Article

Predictors of Low Back Pain among Perioperative Nurses in a Typical Nigeria Teaching Hospital

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Abstract

This study examined predictors of low back pain among perioperative nurses in University College Hospital, Ibadan, Nigeria. **Methods:** The study adopted a mixed method research design. The study population included all the perioperative nurses working in the three operating theatres of the University College Hospital. Participants were 112 having quantitative and qualitative sample (n=102, 10) respectively Quantitative data was entered into Statistical Package for Social Sciences (SPSS) version 23, analysed by descriptive statistic and inferential statistic of logistic regression at 0.05 level of significance and presented in frequency, percentages, charts, mean and standard deviation. The qualitative aspect was analysed by thematic analysis. **Findings:** Finding revealed that about two-third of the nurses were fifty years and above with proportion of female (54.9%) slightly higher than the male proportion (44.1%). Over 40% have 6-10 years of working experience. Over 50% experience low back pain weekly while over 60% asked for excuse duty monthly due to workplace stress and low back pain. Predisposing causes of low back pain was attributed to long-standing hours at work, lifting of heavy equipment, working posture, workload, work shift, body mass index, age and sedentary lifestyle. Perioperative nurses who were above 50 years are 3 times more likely to experience low back pain ($p<0.05$, Odd ratio-2.59, CI: 0.01-8.59). **Conclusion:** Perioperative nurses are susceptible to low back pain, which affect their productivity. It is recommended that hospital management should improve perioperative nurses staffing, work shift, and work environment to meet global best practices in operating theatres and subsequently reduce incidence of low back pain and increase work productivity. **Application to Practice:** There is need for training of perioperative nurses on body mechanics by occupational health nurses and other stakeholders to minimize the frequency of practices that may lead to low back pain.

Keywords: Predictors; Perioperative nurses; Low back pain; University college hospital

Introduction

Low Back Pain (LBP) is considered a serious occupational health problem especially among workers, whose line of duty requires long standing, long siting, bending of posture, lifting equipment [1-4]. Predictors of low back pain may include pressure on spinal nerve root, disc herniation, spondylitis, spinal deformities and compression fracture. Other contributing factors may include age, gender, obesity and long years of practice [3,5]. In hospital setting, low back pain poses a major threat to health and work

productivity especially among nurses [6,7].

Low back pain is a significant musculoskeletal problem among the perioperative nurses [8,9]. It can be severe to the extent of operating room nurses taking sick leave or voluntary retirement from work [1,5]. A study underlined that prevalence of low back pain is six times higher among nurses than other hospital workers. Typically, low back pain breeds undue stress at work, persistent headache and poor working outcome with significant economic loss [4,6].

Moreover, extant studies exposited that operating room nurses are at higher risk of developing low back pain due to long time standing during surgery, patient lifting, overtime duty and other perioperative procedures involving postural changes [1,2,5,9]. A prevalence study by Al-Samawi and Awad among nurses in Elmak Nimer University Hospital-Shendi Sudan reported about 90% low back pain [10]. A cross- sectional study on determinants of low back pain among operating room nurses in Gaza government hospitals reported a prevalence rate of 70.6% [1] while a Saudi Arabia study by Almaghrabi and Alsharif reported cumulative prevalence of low back pain of 82.9% among nurses [11]. Also, Altheyab, et al. reported 79% prevalence rate of low back pain among nurses in Riyadh City, Kingdom of Saudi Arabia (KSA) while another KSA study by Alshahrani, reported 74.8% LBP among nurses in Najran, south western KSA [4,6].

Similarly, a Nigeria study by Hinmikaiye & Bamishaiye, on incidence of low back pain among theatre nurses in two Nigeria teaching hospitals reported 78.1% prevalence while another Nigeria study by Sikiru and Hanifa, on prevalence and risk factors of low back pain among nurses in a typical Nigeria hospital also reported 74% prevalence rate [2,12]. Awosan et al. however reported a lesser prevalence among nurses in Northern Nigeria (56.2%) [3]. The prevalence difference is largely related to study population strata rather than the methodological variation. Nonetheless, the prevalence of low back pain is repeatedly higher in less industrialised (low and middle income) countries as compared to industrialised (developed) countries where work duty is mostly supported by technological innovations [3,4]. Again, according to Awosan et al., prevalence of low back pain is about 50% higher in Africa as compared to developed countries [3].

In Nigeria, Hinmikaiye & Bamishaiye, reported that operating room nurses lift patients manually [2]. Awosan further exposited that operating room nurses in Nigeria are generally involve in manual patient handling viz. lifting, repositioning and transferring of patients. These crude methods of patients handling activities precipitate low back pain among theatre nurses [6]. Clearly, some of the nurses' activities are questionable and are exclusive of nurses' educational curriculum. Awosan, et al. and Altheyab et al. advocated for the use of assistive devices during patients care [3,6]. Nottidge, et al. posited that low back pain among Nigerian nurses is associated with poor workplace ergonomics [7]. Moreover, perioperative nurses require periodic education on occupational health and safety, increased staff ratio, modified duty roster, application of appropriate technology to patient care including nurses' friendly hospital policies [6,11].

Interestingly, most studies reported gender disparity of low back pain among operating room nurses. For instance, Aljeesh & Al Nawajha reported that low back pain prevalence among female perioperative nurses is 10% higher than male perioperative nurses [1]. In the same vein, Awosan et al. corroborates that female gender are more affected with low back pain than male gender and similarly Keriri, posited that female operating room nurses experienced low back pain than male operating room nurses [3,8]. Again, Mijena, et al. reported that female nurses complain of low back pain than male nurses in eastern Ethiopia [5]. Furthermore, study of Alshahrani; in southwest KSA reported higher prevalence of LBP among female nurses [4].

The factors modulating increase low back pain among female nurses as reported by many studies across the globe remains unclear. Mijena et al. exposited that predictor of low back pain among female is associated with feminine physiological factors such as menstruation while Clari. et al. cited hormonal and psychological factors including female exposure to cold at working environment [5,9]. Furthermore, it can also be related to parity, structural and anatomical differences between male and female gender. Consequently, despite the plethora of evidences provided by researches on the aetiology and effect of low back pain on health and work productivity among nurses, studies have continued to report increased prevalence of low back pain among operating room nurses. In Nigeria, there is paucity of data that examined the prevalence and predictors of low back pain among operating room nurses in teaching hospitals. Thus, it is the interest of the researchers to investigate the prevalence and predictors of low back pain among perioperative nurses in University College Hospital Ibadan, Nigeria.

Material and Methods

The study adopted sequential exploratory mixed method research design.. The study was conducted among 112 perioperative nurses in University College Hospital Ibadan, Nigeria. The University College Hospital is the first teaching hospital in Nigeria located in Ibadan metropolis. The hospital is reputed to be centre of excellence for clinical education, research and practice. It has perioperative nursing school among other nursing training programmes. The University College Hospital has three operating theatres; The Main theatre, the Gynaecology theatre and the Emergency theatre. The main theatre of the hospital has ten suites with eighty perioperative nurses; the gynaecological theatre has

two and fifteen perioperative nurses' personnel while emergency unit theatre also has two suites with twenty-five perioperative nurses.

A self-structured questionnaire was used to elicit information from perioperative nurses on low back pain for the quantitative aspect while qualitative data were gathered by in-depth semi-structured interview guide for individual face-to-face. The semi-structured interview guide was flexible as it was s neither close-ended nor open-ended. It gives room for probing questions and allows for the nurses to express themselves while making sure the conversation is relevant to the purpose of the study.

102 respondents filled questionnaires for the quantitative data while 10 perioperative nurses were interviewed for qualitative data with a response rate of 93%. The questionnaires and the interview guide were developed from literature review based on the study objectives. The reliability of the questionnaire was ensured through a test-retest method with the coefficient of stability of 0.78. Quantitative data was entered into Statistical Package for Social Sciences (SPSS) version 23, analysed by descriptive statistic and inferential statistic of logistic regression at 0.05 level of significance and presented in frequency, percentages, charts, mean and standard deviation.

The qualitative data obtained was categorised into various themes and analysed using thematic analysis. Ethical approval was obtained from personal to institutional level; verbal and written consent were sought from the participants while ethical approval was obtained from the University of Ibadan/University College Hospital Ethical Review Committee (EC) with the reference number (UI/EC/19/0517). Also, ethical principles of confidentiality, autonomy, anonymity and non-maleficent were upheld

Results

Quantitative Findings

Table 1 above shows the respondents' socio demographic characteristics. 45 (44.1%) were male while 57 (54.9%) were female. Larger proportion of the respondents were married (76.5%). As regards age, most of the workforce are above 50 years (36.3%). Most had degree qualification (63.7%) with 6-10years of working experience (42.2%) .

Variables	Frequency	Percentage %
Gender		
Male	45	44.1
Female	57	54.9
Total	**102**	**100.0**
Marital Status		
Single	15	14.7
Married	78	76.5
Divorce	1	1.0
Widowed	3	2.9
Separated	5	4.9
Total	**102**	**100.0**
Age as at last birthday		
20-29 years	5	4.9
30-39 years	28	27.5
40-49 years	32	31.4
Above 50 years	37	36.3
Total	**102**	**100.0**
Academic Qualification		
Diploma	36	35.3
Degree	65	63.7
Postgraduate	1	1.0
Total	**102**	**100.0**
Years of experience		
1-5	16	15.7
6-10	43	42.2
11-15	21	20.6
16 and above	22	21.6
Total	**102**	**100.0**

Table 1: Respondents Socio-demographic Characteristics.

Table 2; the predisposing factors to low back pain among the respondents were unfavourable working conditions (99%), working posture (99%), work load (99%), lack of good working condition (99%), body mass index (95.1%) and time to get work done (57.8%).

Variables	Yes	No
Unfavourable working conditions	101(99)	1(1.0)
Working posture	101(99)	1(1.0)
Work load	101(99)	1(1.0)
Lack of good working condition	101(99)	1(1.0)
Body mass index	97(95.1)	5(4.9)
Low working hours	9(8.8)	93(91.2)
Work Shifts	22(21.6)	80(78.4)
Gender	16(15.7)	86(84.3)
Time to get work done	59(57.8)	43(42.2)

Table 2: Predisposing Factors to Low Back Pain.

Table 3 shows the logistic regression analysis of factors predicting low back pain among perioperative nurses. From the result, respondents who were above 50 years are 3 times more likely to experience low back pain ($p<0.05$, Odd ratio-2.59, CI: 0.01-8.59), males are more likely to experience low back pain ($p>0.05$, Odd ratio-1.20, CI: 0.29-4.88), those with postgraduates' education and those with more than 16 years working experience were more likely to experience low back pain compare to their counterparts.

Variable	Statistical significance	Odds Ratio	95% C.I. for EXP(B)	
			Lower	Upper
Age				
20-29	1(ref)			
30-39	0.73	1.14	0.23	6.54
40-49	0.87	1.19	0.14	9.61
Above 50	0.01	2.59	0.01	8.59
Sex				
Female	1(ref)			
Male	0.79	1.20	0.29	4.88
Academic Qualification				
Diploma	1(ref)			
Degree	0.04	1.23	0.24	4.36
Postgraduate	0.67	1.67	0.14	6.10
Years of experience				
1-5	1(ref)			
6-10	0.52	0.33	0.01	10.28
11-15	0.90	0.86	0.09	8XS.03
16 and above	0.30	2.54	0.42	15.28
Unfavourable working conditions				
Agree	0.03	1.53	0.32	7.34
Disagree	1(ref)			
Working posture				
Agree	0.03	4.85	0.56	12.55
Disagree	1(ref)			
Work load				
Agree	0.45	3.36	0.14	7.16
Disagree	1(ref)			

Lack of good working condition Agree Disagree	0.98 1(ref)	0.98	0.14	6.73
Body mass index Agree Disagree	0.01 1(ref)	0.11	0.03	0.41
Low working hours Agree Disagree	0.88 1(ref)	0.81	0.06	10.94
Work Shifts Agree Disagree	0.02 1(ref)	3.41	1.14	10.17
Time to get work done Agree Disagree	0.21 1(ref)	2.21	0.2	8.16

Table 3: Predictors of Low Back Pain among Perioperative Nurses.

Table 4 shows that more than half of the respondents (55.9%) reported that they experience low back pain weekly, while 11.7% have never experienced it before. 68.6% indicated that low back pain affects their performance at work while 67.6% affirmed that low back pain affects their mood and relationship with patients and other health care members. However, 62.7% reported that they do take excuse duty monthly because of low back pain and 71.6% indicated that they do feel exhausted with low back pain after 4 hours of scrubbing for a surgery.

Variables	Frequency	Percentage
How frequently do you experience low back pain?		
Daily	1	1.0
Weekly	57	55.9
Monthly	13	12.7
Quarterly	8	7.8
Twice a year	9	8.8
Rarely	2	2.0
Never	11	11.7
Does low back pain affect your performance at work?		
Yes	70	68.6
No	32	31.4
Does low back pain affect your mood and relationship with patients and other members of the health team at work?		
Yes	69	67.6
No	33	32.4
How often do you take excuse duty because of low back pain?		
Monthly	64	62.7
Quarterly	7	6.9
Occasionally	7	6.9
Never	24	23.5
After scrubbing for how many hours, do you usually feel exhausted with low back pain?		
Two	2	2.0
Three	14	13.7
Four	13	12.7
More than four	73	71.6

Table 4: Perceived Effects of Low Back Pain Among Perioperative Nurses.

Qualitative Findings

Participants' Comment on Low Back Pain (In depth Interview; n= 10)

Theme One: Heavy work load (work related factors)

Heavy workload of perioperative nurses leads to LBP (Participant 1 &2)

Lifting of patients was a major cause of LBP for perioperative nurses (Participant 6)

Prolong standing and carrying of heavy equipment are causes of LBP (Participant 7)

Improper lifting of object is the cause of LBP for perioperative nurses: Nurses are not meant to lift things that are more than 50 kg and the manner in which nurses lift things contributes to the occupational hazard, LBP (Participant 9)

Work shift in itself does not cause low back pain but the heavy workload in each shift. (Participant 2)

Theme Two: Personal Habits

High level of sugar intake is a general cause of LBP. Smoking and drinking alcohol predispose nurse to LBP. Stated that some perioperative nurses drink and smoke and then blame their jobs for having low back pain. (Participants 6 & 7)

Smoking and obesity are predisposing factor. (Participant 9)

Perioperative nurses that drink and smoke and drive long distances are more susceptible to LBP (Participant 3)

Bad sitting position, sedentary lifestyles, lack of exercise and inappropriate posture when picking things from the floor and when sleeping. (Participant 8)

Eating habits, sleeping posture and obesity can predispose perioperative nurses to LBP (Participant 4)

Wrong sitting and standing posture are factors that makes perioperative nurses susceptible to LBP (Participant 6)

Age is a factor. The older a perioperative nurse gets, the more susceptible he or she is to LBP (Participant 7)

Theme Three: Inadequate Staffing

"LBP can be reduced if you have sufficient staff. When there are no enough hands to work, those that are fit will definitely have problems with their back, going up and down, standing and all sort of things" (Participant 2)

Work shift are less stressful (not as stressful as private institutions) and that it is just that personnel are not enough (Participant 7&10)

"Most of the time the job that is supposed to be allocated to 3 or 4 people are being done by 2 so its stressful and when we are on call duty, we do a lot of emergencies" (Participant 5)

Work shift did not predispose nurses to low back pain but inadequate personnel during each shift (Participant 2)

Theme Four: Work Shift

Work shifts is one of the factors that makes nurses susceptible to low back pain. Perioperative nurses in UCH work 8 hours per shift. (Participant 1 &4)

Work shifts were stressful. However, his "work shift is better if" he has "to work in the morning and afternoon" (Participant 8)

Work shift arrangement was stressful. "Sometimes I may be in morning shift then the next day afternoon then morning again which can be very stressful". (Participant 3)

Theme Five: Lifting of heavy equipment and lifting patients

Stated that as a perioperative nurse, it is inevitable to lift heavy equipment. (Participant 9)

Stated that she had to lift heavy objects and lift patients by herself when her colleagues were too busy to help her (Participant 4)

Had to sometimes move machines herself without assistance (Participant 3)

In fact, the first-time participant 6 and 7 felt LBP was while lifting an equipment. (Participant 6 &7)

Stated that lifting heavy equipment aggravated his pain. (Participant 8)

Stated that she is of the opinion that in Nigeria, it might be institutional policy or financial constraint that prevents health institutions from getting hydraulic lifters like they do in the developed world. She stated that hydraulic lifters help to lift patient and relieves stress off the back of the operating team. (Participant 4)

Theme Six: Standing for long

The major occupational hazard of perioperative nurses is LBP because of prolong standing, as there is really no sitting moment for them. (Participant 4 &5)

As a perioperative nurse definitely, you have to stand for long, long hours. (Participant 6)

Perioperative nurses have to stand for long especially when an operation is going on in the theatre (Participant 2)

Stated that standing for long hours made her feel pains (Participant 3)

Theme Seven: Trauma

Low back pain is as a result of trauma; "LBP is majorly as a result of trauma, trauma could be occupational, psychological" (Participant 8)

LBP can be caused by trauma, ageing, stress, and workload. (Participant 8)

Theme Eight: Anxiety as a cause of LBP

Anxiety leads to LBP. "I have read it that anxiety increases hormonal secretion and they affect all sense organs and most of the times when am anxious it might be that something is disturbing me and I would have the pain" (Participant 5)

There is no connection between anxiety and low back pain except that anxiety can make nurses forget to use the right technique for bending and lifting and could make nurses do things that could damage a part of their body. (Participants 1, 2, 3 &4)

Anxiety can make nurses uncoordinated in a way that they forget themselves and do things to their own detriment (Participant 6 &7)

Agrees that anxiety can cause LBP but has never experienced LBP as a result of anxiety. (Participant 10)

Anxiety comes from the need to meet targets (such as required number of surgeries that are needed to be completed within a specified period of time) and shortage of manpower. "There was a time we had a target to operate on 1000 patient within a period of three month so you want to make that possible. (Participant 6)

Presently, we also have a target to operate on a particular type of patient until December this year, so you will get anxious to meet the target and also if you suppose to work with five nurses and two are on sick leave, you will want to get anxious. And also, if a machine suddenly stops working in the middle of surgery, you will be anxious to get another one" (Participant 8)

Discussion of Findings

The study examined the predictors of low back pain among perioperative nurses in University College Hospital Ibadan, Nigeria. More than fifty percent of the respondents were female, over seventy percent were married while two-third were more than forty years old. These socio-demographic variables are consistent with similar studies conducted elsewhere in Nigeria and outside Nigeria. Our finding is consistent with Hinmikaiye and Bamishaiye report of female respondents with over forty years [2]. However, our result is inconsistent with Aljeesh and Al-Nawajha finding among operating room nurses in Gaza where more than three-quarter of the respondents were male and below thirty years old [1].

Finding revealed that the predisposing factors of low back pain among perioperative nurses include working posture, work load, lack of good working condition, work shifts, prolonged standing during surgery, lifting and transferring patients, bending and twisting, lack of appropriate turning device and trauma. These findings corroborate several studies found through literature search. It is consistent with Aljeesh & Al Nawajha, Hinmikaiye & Bamishaiye, Awosan et al, Alshahrani, Mijena et al., Clari et al. [1-5,9].

Logistic regression analysis shows the predictors of low back pain among operating room nurses to also include age, gender, educational background, Body Mass Index (BMI), working postures and other non-work related factors. This is in agreement with the study of Awosan, et al. [3] where logistic regression showed that sex (females), years of experience, BMI and lifting heavy objects at work as predictors of low back pain. However, it is inconsistent with the study of Aljeesh and Al-Nawajha [1] where there was no significant relationship between gender, years of experience, Body Mass Index and occurrence of low back pain. Also, our finding is dissimilar with that of Alshahrani [4] where there was no significant relationship between age, sex, working experience, educational background and prevalence of low back pain.

Furthermore, study shows that operating room nurses in Nigeria work manually, involving lifting of objects and patients without assistance in addition to long standing during surgery. The lack of assistive or lifting devices such as hydraulic lifter is a major concern. This is in line with Awosan et al and Altheyab et al, advocacy that there should be provision of assistive devices to aid patient handling [3,6]. One of the participants was of the opinion that "in Nigeria, it might be institutional policy or financial constraint that prevents health institutions from getting hydraulic lifters like they do in the developed world. She stated that hydraulic lifters help to lift patient and relieves stress off the back of the operating team". This assertion support Alshahrani, position that workplace is more conducive in advanced countries of the world where operating room nurses work with assistive devices [4].

From our findings, challenges related to staffing and shift schedule precipitates low back pain among perioperative nurses. Specifically, we found out that over fifty percent of theatre nurses experience Low Back Pain (LBP) weekly and more than sixty percent of them asked for excuse duty monthly due to workplace stress. The shift duty is plan based on the available staff after some have been given excuse duty. This led to heavy load and low productivity by the available nursing staff. The result is in consonance with Altheyab et al and Nottidge et al, opinion that low back pain affects health of nursing staff and work productivity [6,7]. Finding is also similar to Ike and Olawumi result where

absenteeism from work, reduced turnover rate and decrease socio-economic activities were identified as outcome of low back pain among nurses [13]. In all, inadequate personnel and work shift arrangement make the operating room nurses susceptible to low back pain.

Moreover, Awosan, et al. found out relationship between lifestyle habit and occurrence of low back pain among healthcare workers in Sokoto, Nigeria, which is also related to our findings [3]. Finding suggest a possible relationship between low back pain and high level of sugar intake, smoking, drinking alcohol and obesity among perioperative nurses. It is disheartening that some of the perioperative nurses were reportedly engaged in smoking and alcoholism resulting into low back pain, which affects work turnover. The authors suggest a further study to examine the influence of lifestyle habit on pain modulation among operating room nurses work experience.

Age is also seen as a likely predictor of low back pain among operating room nurses. Finding suggest that older age can make the perioperative nurse susceptible to low back pain. Our finding suggests that perioperative nurses who are fifty years and above are three times likely to experience low back pain. This buttress the fact that those nurses with more than sixteen years of experience are more susceptible to experiencing low back pain and it agrees with Mijena, et al. and other studies on low back pain among operating room nurses that share the same opinion [5].

Another perspective from this study is gender inequality of low back pain experience among perioperative nurses. Contrary to report of many studies in Nigeria, Saudi Arabia, Ethiopia, male perioperative nurses experience more low back pain than female perioperative nurses. This may be related to purported activities such as smoking, alcohol that some of the male theatre nurses reportedly involved in. Most previous studies did not explore the relationship between the sedentary lifestyle and LBP among nurses. Nonetheless, the low back pain gender disparity between male and female perioperative nurses is still a subject of debate. Future studies should examine the influence of nutritional status and personal lifestyle of operating room nurses to low back pain.

Again, another emerging theme from our finding is the correlation between low back pain and anxiety. Participants' experience differs on how anxiety can modulate low back pain. Finding revealed that seventy percent of the respondents' mood affects their relationship with patient and other team members. This finding however does not implicate anxiety as a causal effect of low back pain. Another suggestion for further study is to assess the role of anxiety as well as gender, eating habit as predisposing factors to low back pain. This is a gap in most studies that need to be filled to uncover the predictors of low back pain in most developing countries.

This study is done among perioperative nurses in a teaching hospital located in one out of six geopolitical zones of Nigeria and it is not scientifically suitable for generalization to all perioperative nurses in Nigeria. The study is also a cross-sectional study and finding does not provide a direct causal effect of low back among perioperative nurses which is a limitation. However, our findings filled the gap in most previous studies and it is appropriate to guide practice and decision making in hospital settings in low- and middle-income countries.

Implications for Occupational Health Nursing Practice

Findings from this study showed that low back pain among perioperative nurses was attributed to long standing hours at work, lifting of heavy equipment, working posture, work load, work shift, body mass index, age and sedentary lifestyle and this causes loss of labour force, reduction in labour productivity and significant economic loss. The predictors of low back pain among the operating room nurses included lifting of object and/or patient without assistance, lack of assistive devices, long hours of standing during surgery, inadequate staffing. Other non-work-related predictors included age, gender, anxiety, smoking, alcoholism, educational level. Gender in particular as a predictor of low back pain among operating room nurses remain unclear and require further inquiry. Therefore, there is need for occupational health nurses to be involved in the training of operating room nurses on body mechanics, good workplace ergonomics and safety. There is equally need for the procurement of assistive device for lifting, organized shift hours, work incentives, increased staffing and nurses' friendly hospital policies as a panacea to reduce incidence of low back pain among perioperative nurses thereby increase work productivity and positive patients' outcome.

Application of the Research to Occupational Health Practice: This study established the perioperative nurses are integral part of the surgical team and hat they are susceptible to low back pain, which causes loss of labour force, reduction in productivity and significant economic loss to the health care industry. The occupational health Practitioners need to work to with managers to health care facilities to devise modalities of reducing the incidence of low back pain and other musculoskeletal disorders among this group of nurses.

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Authors Contribution

Olufemi O Oyediran involved in study conceptualization/ design, data collection and drafting of the manuscript. Samuel Oladele Adeyemi involved in data collection and data analysis. Kolawole Damilare Ogundeji involved in qualitative data analysis and drafting of manuscript. Israel Opeyemi Fawole involved in quantitative data analysis. Funmilola Adenike Faremi involved in critical review of the manuscript and proof reading. Emmanuel O Ayandiran involved in critical review of the manuscript and proof reading.

Authors Statement

This is to state that the manuscript has been read and approved by all the authors and all authors met the requirements for authorship and that each author believes that the manuscript represents honest work of all the contributors.

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