Low Back Pain among Nurses in Intensive Care Unit at Selected Hospitals- Khartoum State-In Sudan (2019-2020)

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ABSTRACT

Background: Low back pain (LBP) remains one of the most common occupational hazards among the nursing profession, because the Nursing job needs combination of both physical and psychosocial demanding tasks. The main objective of this study is to determine the work related factors of (LBP) among nurses. **Methods:** Descriptive, cross-sectional, hospital based study was performed among nurses employed at eight governmental hospitals at Khartoum state-Sudan, during (October-2019-February-2020), through total coverage sampling. Modified a self-administer questionnaire was used to collect data from169 nurse aged between 20 and 49 years, of both sex. Data was collected and analyzed using SPSS version 21(confidence level 0.95and error margin (0, 05).**Results:** The prevalence of LBP was found to be (n=133, 78.8%). The factors that are significantly associated to LBP were: Female gender (n=99, 81.3%), and who performing of some risky activities such as: change the bed sheet (P = 0.00), frequently push-pull heavy objects (P =0.05), and standing for prolong period during workday (P =0.035) **Conclusion:** prevalence of LBP among nurses is high, and practices that require heavy lifting and carrying the patients, prolong standing in a work day as a part of nursing care are among the main factors that cause LBP in nurses.

Keywords: ***Low Back Pain, Nurses, intensive care unit, selected hospital, Khartoum state***

Introduction

Low back pain is one of the most serious health problem of tremendous medical and socioeconomic dimension. [1, 2, 3] With high prevalence observed especially among nursing. Since nurses carry out repetitive procedures where patient lifting aids are not always available or practicable. [4,5,6,7,8,9,10]

In occupational environment, LBP is major problem for nurses with regard to absenteeism and capacity for work, mainly in care environment

Sickness, presenters which may increase the risk of developing health disorders, productivity making these common conditions the single largest contributor to

musculoskeletal disability worldwide. LBP is defined as discomfort in the spinal area (between the lower costal margins and gluteus folds) experienced at least once a month, with or without radiation to lower limb. [2,8,11]

Intensive care unit (ICU) exhibits important risk for nurses Moreover, the ICU areas have been designated for the care of unstable patients. Heavy handling, prolonged bearing of inappropriate postures, bending twisting, working hours stress, psychological high demand and weak social support are all integral parts of the nurses' daily work. And it would be of benefit understanding the prevalence of LBP in developing nations such as Sudan.

These problems are reflected in the work environment and may affect patient care delivery. [12,13, 14,15]

Knowledge of proper lifting techniques is needed to aim at reducing musculoskeletal complaints and safe patient handling. [11, 16, 17]

This study emphasizes the important of preventive measurement for nurses career to control LBP occurrence such as :increasing number of qualified nursing staff, introducing and training in patient handling aids and devices .

Methods

Study Design

This cross-sectional hospital base study design done to assess Low Back Pain among Nurses in Intensive Care Unit at Selected Hospitals- Khartoum State-In Sudan (2019_2020)

Study area and setting

This study was Carried out at ICU' s of eight governmental hospitals as following (Khartoum, Alshaab, Dental, Dr Gaafar Ibn auf Referral Paediatric, Ibn sina, Ibrahim Malik, Altamayose Center for Trauma and Emergency and The National Center for Neurological disease and sciences)– Khartoum state-Sudan.

Data Collection:

The data collection was conducted during the period ranging from December, 2019 to February, 2020. Coverage all target population 169 /200 with eligible included criteria, using predesigned a self-administered questionnaire; consist of three parts: The first allowed collecting the general Socio-demographic data, The second part interested only the nurses with LBP with the description of their complaint The third part explored 12-month prevalence of LBP; questionnaire was-in part- rephrased and reviewed to insure that cover and satisfied the objectives of study.

Sampling and Sample size:

Coverage all target population with eligible included criteria since the required estimation sample (RSS) is near to the total population

Using a simple formula ($n = Z^2P (1-P)/ d^2$) to estimate the population proportion

P was determined at 0.80 based on the mean of prevalence in three previous studies. [18, 19, 20]

The d was set as + 0.05

The level of statistical significance, = 0.05.

Inclusion Criteria:

Included nurse (male-female) with fulltime at least working for six month pre the study.

-Nurse's age less than 50 years because older nurses will not be able to tolerate the physical demands of patient care that requires them to turn or lift

Exclusion Criteria:

Excluded nurse who experienced pregnancy three month prior to study

-Nurse with a health problems that may cause LBP e.g. (rheumatoid arthritis, history of car accident-related injuries and disc prolapsed) and menstruation

- Long-term sick leaves and long annual leave>3 month proceeding the study

Data Collection Tools:

Data was collected using a self-administered: by pre-constructed and pre tested questionnaire that was designated to include the following:

Section I: contain, socio-demographic data, which consist of eight questions such as :(age, level of education marital status, body mass index BMI).

Section II: contain questions related to risk factors of LBP which consist of nine questions such as : (years of employment and experience in ICU, working shift, standing hours per shift, lifting and carrying of heavy object, performing of some risky activities).

Section 111: The 12-month prevalence of LBP which consist of nine questions such as (what is the time when back pain first occurred, severity, frequency, Interventions performed to overcome LBP.)

Data Analysis Technique:

SPSS 21.0 was utilized for the statistical analysis, frequency distributions of responses, and cross-tabulations of individual, job risk factors were studied in association with reported prevalence of LBP. Group differences were further analyzed by the chi-square test and level of significance was determined at $p<0.05$

Data collected in four months from October 2018- February-2019.

Questionnaires were coded and transferred into especially designed formats so as to be suitable for computer feeding, following data entry checking and verification process

carried out to avoid any errors during data entry process, frequency analysis, cross tabulation and manual revision was perform.

Pilot study :

A pilot study was conducted to confirm the reliability, validity, and design to be used in the larger study, carried out on 15% of the target population, and after taking needed permission from hospitals authorities based on the feedback regarding the research objectives

Questionnaire was-in part- rephrased and reviewed to insure that cover and satisfied the objectives of study and any ambiguous or not understood question was clarified.

Ethical consideration:

The researcher full filled the necessary steps required to get the approval for carrying out the study

Result:

The response rate was 84.5% (169/200); 31(15.5%) of respondents were excluded from the study

Table 1.Socio demographic characteristics of respondents, (n=169)

Variable		**Frequency**	**Percentage (%)**
Gender	Male	47	(27.8)
	Female	122	(72.2)
Age	20 and less than 30	158	(93.5)
	30 and less than 50	11	(6.5)
Educational qualification	Diploma degree	12	(7.1)
	Bachelor degree	151	(89.3)
	Master degree	6	(3.6)
Marital status	Un married	152	(89.9)
	Married	17	(10.1)
Number of children	No child	152	(89.9)
	1-3 child	11	(6.55)
	3 and more	6	(53.6)
Body mass index	Underweight	29	(17.2)
	Normal weight	119	(70.4)
	Overweight	15	(8.9)
	Obese	6	(3.6)
Practice regular exercise or sport	Yes	63	(37.3)
	No	106	(62.7)
Smoking habits	Current smoker	12	(7.1)
	Never	157	(92.9)
Working experience	1-4 year	159	(94.1)

	5-9 year	10	(5.9)
Working shift	Morning	45	(26.6)
	After noon/ night	124	(73.4)
Means of transportation to work	On foot	38	(22.5)
	Private car	8	(4.7)
	Public transportation	116	(68.6)
	Other/bicycle	7	(4.1)

Table 2.Characteristics of LBP among Nurse Staff (N=133)

Findings about LBP	**Values** N (%)
LBP experienced in the past n =(133)	
Experienced	133(79)
Not experienced	36(21)
Duration of low back pain n =(133)	
Less than three month	92(69)
More than three month	41(31)
Time when back pain first occurred n =(133)	
Before starting the profession/job	23(17)
After starting the profession/job	110(83)
Stress level	
Mild	83(62)
Moderate	40(30)
Severe	10(8)
Diagnosed as LBP by physician n =(133	
Yes	23(17)
No	110(83)
Intervention perform to overcome low back pain1n=133)	
Bed rest	89(67)
Massage	24(18)
Exercise	9(7)
Other	11(8)
Receiving treatment for low back pain n =(133)	
Receiving treatment	43(32)
Not receiving treatment	90(68)
LBP Affects daily work activity n =(133)	

Yes	72(54)
No	61(46)
Radiated to the leg n =(133)	
Yes	14(11)
No	119(89)

Table 3. The relationship between the nurses' status of experiencing LBP and work related factors

Variables	**Occurrence of LBP n (%)**			
	Respondents with LBP (n=133)	Respondents without LBP (n=36)	Test of Significance	P value
Working experiences mean(SD) 0-4 year 5-9 year 10 years and more	 125(94) 8(6) (0)	 34(94.4) 2(5.6)	0.01	0.92
Night shift % Yes No	 97(72,9) 36(27.1)	 27(69.4) 9(30.6)	6.602	0.086
Mean of transportation to the work % On foot Private care Public transportation Other	 27(19.5) 4(3.8) 96(73.7) 6(3)	 11(33.3) 4(8.3) 20(50) 1(8.3)	0.062	0.803
Standing hour% <8 hour >8 hour	 47(35.3) 86(64.7)	 12(47.2) 24(52.8)	6.678	0.035
Perform of risky activities				
frequently lift objects above the waist% yes no	96(72.2) 37(27.8)	 21(58.3) 15(41.7)	2.550	0.110
frequently bend to lift items from floor% yes no	 101(75.9) 32(24.1)	 21(58.3) 15(41.7)	4.375	0.36
frequently change bed				

sheets while patient in the bed% yes no	 125(94) 8(6)	 15(41.7) 21(58.3)	 54.553	 0.000
frequently push-pull heavy objects% yes no	 110(82.7) 23(17.3)	 22(61.1) 14(38.9)	 7.727	 0.05
Work stress% Low Moderate High	 12(9.0) 25(18.8) 96(72.2)	 8(22.2) 5(13.9) 23(63.9)	 4.832	 0.89

Discussion

The onset of LBP during the past year in the present study is significant ($p < 0.001$),the majority (n=110, 83%) of respondents had experienced symptoms of LBP only after their professional career. supported by numerous studies; in Sudan (87.5%) of nurses experience more LBP than other hospital workers.[18]And concurred with the findings in Nigeria, [11] consistent with that in Egypt which revealed that the highest percentage of LBP was found among ICU's nurses (95.0%). 100% of cases, it had occurred within the last 12 months. Probably because all most of the participant were new graduate with experiences less than 4 years. Closed to that literature. [4, 19,20]

The current study result has shown that majority of the sample (125.94%) complained of LBP within 1-4years' experience (P>0.05), in accordance to the literature. [21, 22] This is probably due to the younger age distribution of respondents in the present study as the nurses in the first group were unaccustomed to the work activities; there was no conditioning to the muscles which caused more discomfort. possible explanation that with experience, nurses learn how to protect their backs, and by the time they become fit and make right decision about their abilities .these results were in agreement with those of. [23, 24]

Smoking was not significant predictor for LBP p value>0.05 in current study may since that the sample comprise were predominantly female (122, 70.4%) similar finding in those study. [4, 15] In contrast to. [25]

The current study revealed a protective effect of practicing regular exercise on developing LBP. Similar results was reported by several authors. [11, 19] Because daily exercise helps

to maintain and strong back muscles so that it can be adapted with sudden force and thus decreases the frequency and severity of LBP against abnormal forces.

On the other hand, there is a high percentage among those with LBP who had worked night shift, and among those who used public transportation to the work, one possible explanation , Nurses were standing up for long periods of time, working in wrong posture for long time, disruptions of sleeping cycle and eating habits. This statement is in accordance with the results of a study conducted in Korea. [26]

LBP in present study, particularly high among nurses who had to perform the risky activities; repositioning the patient, bending for word, push pull respectively probably could be due to most of these respondents were un able to apply PBMs while performing these physical tasks, shortage of qualified nursing and lack of patient handling aids, This result was in accordance with those. [3,27,28] That carrying loads over 10 kg was associated with pain duration over one day, visit to a health professional and taking a treatment for LBP

[32, 33]In a line to previous studies

The frequent repositioning of patients in bed up to nine times per shift was also found to be significantly associated to LBP. [3, 16] This supported the current study findings.

Standing for more than eight hours associated with LBP in current study there is a strong association between standing hours and LBP (P value<0.05). These findings supported with previous studies. [16] Which have characterized the postural alterations that occur during prolong standing and postural orientation deficits.

There was a positive relationship between perceived stress level and the occurrence of LBP in current study (96,72.2%) ,in high stress level psychosocial work factors may lead to work stress which produces physiological reactions such as increased muscle tension in the lower back causing LBP .[28]

Conclusion

- This study indicates that LBP was a common health problem among nurses studied
    - It was more prevalent among those with short year experience, working in shifts with long standing hours and performing of risky activities
    - Study found that better educated staffs were more likely to be involved in direct patient care.

- Preventing LBP in nurses is important in order for nurses to exercise their fundamental right to work under healthy and safe conditions and to provide better support for the patients. So necessary individual and institutional precautions should be taken

- Recommendation

The findings of this study indicated that nurses need to take precaution to prevent LBP from occurring. In order to prevent LBP at a later stage of their career.

- Implementation of patient handling regulations, team lifting when required and training nurses, in both schools and workplaces, on handling weights and on using mechanical aids in everyday work, is essential.
- Nurses who first join the work force have to be made aware of this potential occupational hazard and take precaution from the start of their nursing career.
- Nurses need to use assistive devices whenever possible in patient handling tasks. Have to learn and be discipline in performing back-strengthening exercises.
- Preventive measures should be taken to reduce the risk of LBP, such as arranging proper rest periods, educational programmed to teach the proper use of body mechanics, improving nurse staffing, reducing the frequency of night shifts and assessing risk factors in specific ICU specialties are suggested to decrease back pain prevalence.

. Study Limitations

- It is a cross-sectional study concerning loss of objectivity. However, self-reporting is the main approach to study symptomatic disorders, especially considering the subjective nature of symptoms of low back pain. And The physical examination does not always allow a diagnosis and its validity can be questioned as there is no gold standard method for comparison An important source of potential bias in occupational cohort studies is the healthy worker) .[29]

Acknowledgements

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