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Low Back Pain and Associated Factors among Nurses Working in Hospitals, Bole Sub City, Addis Ababa, Ethiopia, 2020

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Abstract

Background: Back pain, also known as backache, is pain felt in the back. The back is divided into neck pain (cervical), middle back pain (thoracic), lower back pain (lumbar) or coccydynia (tailbone or sacral pain) based on the segment affected. The lumbar area is the most common area affected. Episodes of back pain may be acute, sub-acute, or chronic depending on the duration. The pain may be characterized as a dull ache, shooting or piercing pain, or a burning sensation. Discomfort can radiate into the arms and hands as well as the legs or feet, and may include numbness, or weakness in the legs and arms. Nurses are the front line health professional who spent most of their time caring for their patients. Due to prolonged standing due to long procedures and caring debilitated patients' nurses are prone for low back pain (LBP). This pain affects their quality of life and sometimes may force them to absent from their job. However, there is no sufficient information on the prevalence of low back pain and its associated factors in the study area.

Objective: The main objective of this study is to assess the prevalence of low back pain and associated factors among nurses, working in private hospitals in Bole sub city, Addis Ababa, Ethiopia.

Methods: Institutional based cross-sectional study was conducted among 196 nurses from April 20 to May 20, 2020 by use of simple random selection. Data was entered to SPSS version 21 for analysis. Descriptive analysis was performed for each variable. Association between dependent and independent variables was examined using bi variable and multivariable logistic regression models with 95% confidence interval. Level of significance was determined at p-value less than 0.05.

Result: Over half (56.3%) of the respondents were females; the mean (standard deviation) age of the nurses was 28 (± 7.38) years. The overall prevalence of low back pain was 67.2%. About 33.9% of the nurses reported that they had sleeping disturbances. The odds of low back pain among nurses who had a sleeping disorder were 57% less likely (AOR=0.43; 95% CI: 0.23, 0.82) compared with nurses who had normal sleep.

Conclusion: About 33.9% of the nurses reported that they had sleeping disturbances. Low back pain among hospital nurses was almost comparable at 79.9% and 70.7%, respectively. Thus, addressing work-related and individual factors are essential to decrease the burden of the problem.

Keywords: Prevalence; Risk factor; Low back pain

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Introduction

Low back pain (LBP) is a public health problem worldwide and is a common cause of health- related disorder among health care workers, especially in the nursing profession [1-5].

Low back pain is an occupational hazard that affects the productivity of nurses [6]. Recruitment and retention of nurses is a challenge, and the nursing shortage has been exacerbated by the burden of occupational injuries such as LBP and related disabilities [7]. It is estimated that in the United Kingdom, each year 12% of nursing personnel will consider a job transfer to reduce their LBP and another 12%-18% will actually leave the nursing profession because of chronic back pain [4].

Health-related musculoskeletal disorders in nursing staff are

costly and this includes indirect costs associated with hiring temporary or replacement personnel, overtime to absorb the duties of an injured worker, legal fees, time costs for claim processing, decreased health output following traumatic events and training temporary or replacement personnel [5]. Nurses are a major part of the work force in the health sector [8]. At a regional hospital in KwaZulu-Natal, the physiotherapy LBP caseload in all nursing categories increased from 15 (30%) to 23 (45%) over three years. About 40% of nurses who required physiotherapy were working in theatre, intensive care units or medical wards [9]. The factors associated with LBP at the hospital remained unclear as to whether the cases are purely occupation related or because of other causes. In addition, some nurses with LBP could have sought treatment from other practitioners outside the hospital [10]. For the purpose of this study, current LBP refers to pain that respondents had at the time the study was conducted and lasting for three months or more in an area between the 12th ribs and gluteal fold [11].

Statement of the problem

The mean point prevalence of LBP in Africa among the adult population is 32% and the chronic LBP prevalence among Africans ranges from 14% to 72%. Low back pain is common among health workers and the nurses are the majority hospital workforce [4]. The prevalence of LBP reported in different studies among nurses in Africa ranges from 33% to 73.5%. The LBP point prevalence among employees in a district hospital in South Africa was found to be 47%. District hospitals provide Level 1 hospital service that cannot be delivered at a clinic or a health centre, whereas regional hospitals offer Level 2 services that provide care requiring the intervention of specialists and general practitioners [4].

Low Back Pain (LBP) is one of the common Musculoskeletal Disorders (MSD) affecting many people worldwide and it is one of the most common and most expensive occupational health problems in both developed and developing countries [6].

Studies available on low back pain and the nursing occupation suggest that nurses are subjected to various stressful conditions during performing their duties. Because the duties of nurses are not limited to only nursing in hospitals, but also they anticipated in preparing working materials, participating in extra activities, assessing patient's health, and satisfying requests from management [9-11]. These may contribute to suffer adverse mental and physical health problems and limits participation in social activities to the nurses [10-13]. Various studies have shown that the main occupational risk factors associated with LBP in nurses are lifting and moving patients, sustained postures, job organization, poor ergonomic structures, improper health design, low social support, poor job satisfaction, staff shortages and poor working conditions [2]. Consequently, LBP is associated with absenteeism and decreased productivity [3].

District hospitals provide service that cannot be delivered at a clinic or a health centre, whereas regional hospitals services that provide care requiring the intervention of specialists and general practitioners. However, regional hospitals are often the most overburdened of all levels of hospitals, bearing the brunt of the shortage of staff and equipment in district hospitals [3].

In Ethiopia, the prevalence of LBP range from 44% to 74.8% [5,11-13]. But still the studies done on this area are limited. Therefore, this study will try to ass the prevalence of low back pain and its associated factors among nurses working in private hospitals in Addis Ababa.

Significance of the study

The epidemiological information regarding the prevalence and associated risk factors of low back pain among high hospital nurses in the study area is unknown. Thus the aim of this study was to investigate the prevalence and associated risk factors of low back pain among nurses working a high level privatehospitals in Bole Sub-city. It will help the nurses to know the level of low back pain prevalence and associated factors in order to protect them from LBP and its permanent effect. Furthermore, this study will provide baseline data to assist policy makers in developing appropriate evidence-based strategies and policies to promote safe working environment for the nurses as a whole.

Knowing the factors associated with LBP will assist in identifying all the nurses at high risk and recommend ways to prevent LBP.

Methods and Material

Study area and period

Addis Ababa is geographically located at 9˚2' North and 38˚42 East. As a capital city of the Federal Democratic Republic of Ethiopia, it is located almost at the center of the country. Addis Ababa City Administration is divided into ten sub-cities: namely, Addis Ketema, Akaki-Kaliti, Arada, Bole, Gulelle, Kirkos, Kolfie-Keraniyo, Lideta, Nefas Silk-Lafto and Yeka Sub-city. This study was conducted at Bole sub city, Addis Ababa, from May 15-30, 2020. Bole is one of the ten sub cities that are established under Addis Ababa city administration. Area of Bole sub city is 122.08 sq.km. The total Population living in the sub city is around: 328,900 Male: 154,542 Female: 174,358 Population densities per sq. m: 2,694.1.

Study design

Institution based cross-sectional study design was conducted.

Study population

Source population:

The source population for this study was nurses who are working in the privatehospitals of Bole Sub City.

Study population:

The study population for this study was nurses working in the selected private hospitals in Bole Sub City during the study period.

Inclusion and Exclusion criteria

Inclusion criteria

- Nurses with three and above years of work experience
- Age between 21 and 60 and above years.

Exclusion criteria

- Nurses with an obvious musculoskeletal disorder, such as (exaggerated lumbar lordosis, scoliosis, ankylosis)
- Nurses with a known history of low back trauma
- Nurses who are on sick leave or other leave

Sample size determination

The sample size was determined by using single population proportion formula. It was computed by considering 44% of prevalence of low back pain among hospital nurses in Addis Ababa 2016 Invalid source specified.; 95% confidence level and 0.05 margin of error.

$n = \frac{Z\ \alpha/2^2\ \ p\ (1-p)}{d^2}$ or $n = \frac{Z\ \alpha/2^2\ \ p\ q}{d^2}$

Where reliability coefficient Z α/2is=1.96, p = 44%, q=0.56 d=0.05

Sample size= (1.96*1.96) * 0.44*(1-0.44)/0.0025=378.6~~379

From the list of employers the numbers of the hospital nurses in seven privet hospitals were 338 which is less than the sample size. Therefore, the following correction formula was used

nf= n/(1+n)/N

nf=379/(1+379/338)=379/2.12=178

Considering a non-response rate 10% was add on the final sample size (178+10% (17.8~18)).

=178+18=196

The final minimum sample size was 196.

Sampling procedure and sampling technique

In Bole sub city, there are seven private hospitals. Using lottery method four hospitals was selected. The number of nurses working in each hospital was obtained and the sample size was allocated proportionally. Finally, a sample frame was developed from the nurses list from their monthly salary pay roll and individual nurses was selected using simple random technique.

Data collection tools and methods

The questionnaire was developed from previous similar studies. The tool contains information about socio-demography; question related to low back pain and associated factors for LBP etc. The tool was developed in English and translated to Amharic for easy understanding by all level of nurses. The Data was collected using self-administered questionnaire. The data was collected by an experienced diploma holder nurses who were tack One-day training was given for the data collectors on the objective of the study and to be familiarize with the tool. The data collection process was supervised by principal investigator [14-20].

Variables of the study

Dependent variables:

Low back pain

Independent variables:

Age, sex, monthly income, smoking habit, habit of doing physical exercise, Static health position (sitting and standing), awkward postures and manual material handling, workplace social environment, job satisfaction, adequate number of nurses in the hospital, use of nursing aids, paid activities other than nursing and previous training in ergonomic [21-27].

Operation definitions

LBP: A nurse was considered as having a low back pain if he/she had a perceived ache, pain or discomfort localized below the coastal margin and above the inferior gluteal fold during the last 12 months.

Acute low back pain: pain of <3 months in duration

Chronic low back pain: pain that has persisted beyond normal tissue healing time (or pain persists for more than three months) [28].

Professional health experience: Length of employment as a nurse was considered.

Habit of doing physical exercise: It was considered as present when a nurse had a planned, structured and repetitive physical activity which is done at least 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity a week, or a combination of moderate and vigorous activity.

Workplace social environment: Perceived cooperation and healthy relationship with colleagues was considered as a good social environment and the opposite as poor while neither good, nor poor was considered as fair.

Job satisfaction: It was considered as good if the nurse likes his/her job and poor if the satisfaction was not good.

Health posture: 'prolonged standing' and 'prolonged sitting' was defined as the working condition in which a nurse continue to assume standing working posture for over 50% of total working hours during a full health shift.

Adequate nurses in the hospital: It was considered as adequate when the hospitals meet their plan for number of nurses for the subject matter taught by the nurses interviewed.

Data quality assurance

Data collection process was closely supervised; the questionnaire was developed in English, translated to Amharic and retranslated back to English to check its consistency. To evaluate the understandability and the applicability of the instruments, the questionnaire was pretested out of the study area on 5% of sample size before actual data collection period. Based on the finding there were some modifications and arrangements on the respective questions. Measurements and responses were cross checked for missed values, irregularities, inconsistencies, and corrective measures were taken as required.

Data entry and analysis

The collected data was checked manually for questions un-answered and other errors. Data was coded; SPSS version 21 was

used for data entry and analysis. The result was presented using tables and graphs. Descriptive statistics was used to determine the frequency of different variables. Association between dependent and independent variables was examined using bivariate and multivariable logistic regression models and was reported as unadjusted odds ratio (OR) and adjusted odds ratios (AOR) with 95 % confidence interval (CI) respectively. P-value <0.05 was used to determine the statistical significance.

Ethical consideration

Ethical clearance was obtained from the department of public health in Rift Valley University, and health office of Bole Sub City. And the health office of bole sub city provided a cooperative formal letter that was submitted to the selected hospitals. Written consent was obtained from each participant. Study participants were informed about the purpose and benefit of the study as well as confidentiality of the study and excluding name of respondents. They were assured that their response will only be used for the research purpose only. For those who will not be comfortable to participate in the study, their right was respected.

Result

Socio-demographic and economic characteristics

A total of 192 Privet Hospitals Nurses were included with a response rate of 97.9%. Over half (56.3%) of the respondents were females; the mean (standard deviation) age of the nurses was 28 (± 7.38) years. Nearly two-thirds 90(46.87%) were unmarried, and 85(44.3%) served for 1-5 years. Only 35.4% of the nurses had an extra source of income.

Work-related characteristics of respondents

More than (75%) of the nurses worked in a prolonged standing position. The mean (standard deviation) time of standing per day without any break was 2.57 (± 1.08) hours.

About 33.9% of the nurses reported that they had sleeping disturbances. Almost half of (49.5%) of the nurses were exposed to prolonged sitting due to extra activities, and the mean (standard deviation) time per day for sitting was 1.51 (± 0.5) hours. The majority, 125 (65.1%) used nursing aids and devices, while more than half (60.4%) of them stressed related with carrier. About 31.8% of the nurses had changed their jobs. It was reported that 130(67.7%) of the nurses were satisfied with their job. Two thirds (64.0%) of the nurses said they were irritated or angry with either their family or supervisors or immediate bosses.

Prevalence of low back pain

In this study, the overall prevalence of low back pain in the last 12 months was 67.2% (95% CI: 60.1%, 73.8). The prevalence was substantially higher among women (82.2%) than men (66.1%). It was stated that prolonged standing was the most probable cause of low back pain among nurses, and the majority (93.2%) developed the pain after their employment. The duration of low back pain extended up to 12 weeks for about one-third (30.1%) of the nurses.

Factors associated with low back pain

Age, sex, work experience, marital status, duration of working hours per week, habit of physical exercise, hours standing per sessions, body mass index and using nursing aids were entered to multivariable logistics regression. Work experience, duration of working hours per week, habit of physical exercise, using of nursing aids and hours standing per session was found significant association with low back pain [29-32].

Nurses who had a 1 to 6 years working experiences were 6 times more likely to experience low back pain compared with those nurses who had a work experience of more than ten years (AOR=6, 95% CI: 1.78, 20.24). Nurses who were working for less than 60 hours per week were 62% less likely to experience low back pain compared with those nurses who were working for more than 60 hours per week (AOR= 0.38, 95% CI: 0.16, 0.88). nurses who were doing a regular physical exercise were 73% less likely to experience low back pain compared with nurses who don't have a regular physical exercises (AOR=0.27(0.11, 0.63). Nurses who stands for more than 3 hours per session were 8 times more likely to experience low back pain compared with nurses who stands for less than one hour per session (AOR=8..6, 95% CI: 2.5, 29.4). Participants who were using nursing aids were 75% less likely to experience low back pain compared with those participants who didn't use nursing aid (AOR= 0.25, 95% CI: 0.09, 0.7) [33].

Discussion

In this study, the overall prevalence of low back pain was 67.2% (60.1%, 73.8%). The result was in line with the study conducted in Iran [34]. However, it was higher than those studies conducted in Japan (20.6%) [12]. Low awareness about how to decrease and control such work place hazards, the way work is organized, and the excessive work load of hospital nurses could be considered as factors contributing to the differences observed in the studies in the other places. Moreover, the high proportion of female respondents might be the other justification for the greater prevalence in this study. This is because women nurses are culturally and socially obliged to perform almost all home activities which results in a heavier work load and greater risk to LBP than male nurses. In addition, since women tend to have a lower pain threshold than men, they are more likely to report problems than men.

The result of this study indicated that work experience of one up to ten years were more exposed for low back pain. This finding is similar with the study findings from East and West Wellega Zone nurses [35]. This could be those nurses with few years of work experience may verbalize the pain compared to nurses who have more years of experiences as their threshold level of pain may increase. However, this finding is in contrary to a study findings in Harar and Dired Dawa [36]. This could be due to the reason that spending many years of life working as a nurses exposes for prolonged standing which eposes for low back pain.

Nurses working less than 60 hours per week were less likely to have low back pain. In other ways, working more than 60 hours per week or more than eight hours per day was the factors associated with low back pain. This finding is in line with the

study findings from Penang Malaysia [37]. This could be due to prolonged standing increased pressure on the spine which make the lower back muscle tighten and spam leading to lower back pain.

Nurses who have a habit of physical exercise were less likely to be exposed for low back pain. This finding is in line with the study findings from Denizil [38], Tehran [34], Addis Ababa [39], Qatar [40]. This could be due to a general exercise program that combines muscular strength, flexibility and aerobic fitness is beneficial for rehabilitation of non-specific chronic low back pain. Increasing core muscular strength can assist in supporting the lumbar spine. Improving the flexibility of the muscle-tendons and ligaments in the back increases the range of motion and assists with the patient's functional movement. Aerobic exercise increases the blood flow and nutrients to the soft tissues in the back, improving the healing process and reducing stiffness that can result in back pain [41].

Nurses who work for more than three hours while standing were significantly associated with low back pain. This finding is in line with the study findings from Denizil [38]. This may be due to the effect of physical efforts during nursing care resulting in an excessive strain on the lumbar spine, subsequently leading to back pain. Most nurses experience the same standing position risk for the development of lower back pain. Using nursing aid has a protective effect from low back pain. This could be due to the reason that nursing aid may support nurses in mobilizing equipment which in turn reduce the burden on back bone.

The cross-sectional design might have prevented the work from showing temporal relationships.

In addition, since low back pain has not been verified by clinical diagnosis in the last 12 months, our result is based on self-reporting. Thus, it is possible that participants fail to remember correctly and end up in a recall bias. Although the Nordic musculoskeletal tool is a standardized questionnaire to measure low back pain and musculoskeletal disorder, it is not validated for the study setting.

Conclusion and Recommendation

Conclusion

In the study setting, the magnitude of low back pain among private hospital nurses was high, and work experience, prolonged standing during sessions, and duration of working hours per week, physical activity, and using nursing aid were found to be statistically significant.

Recommendations

Finally based on the findings the following recommendations are forwarded:

- The hospitals should minimize the time for which the nurses spent per week by increasing the number of nurses.
- Nurses should be actively involved in regular physical exercises
- Increasing access to nursing aid materials which reduce the burden on nurses while transporting medical equipment.
- Further research can be done by increasing the number of health facilities in the city.

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Conflict of Interest

The authors have no conflict of interest to declare for this study.

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