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St. Paul's Hospital Millennium Medical College
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Magnitude and factors associated with lower back pain among intensive care unit nurses at public hospital Addis Ababa , Ethiopia 2024.

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A Research thesis submitted to the Department of Emergency and Critical Care Nursing; Presented in Partial Fulfillment of the Requirements for the Degree of Masters in Critical Care Nursing; St. Paul Hospital Millennium Medical College.

Aug 2024
Addis Ababa, Ethiopia.



St. Paul's Hospital Millennium Medical College
Graduate Study Program

Magnitude and factors associated with lower back pain among nurses
working in ICU at public hospitals, Addis Ababa, Ethiopia 2024.

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St. Paul Hospital Millennium Medical College
Department of Critical Care Nurse Practitioner

Name of investigator	M e n i l s h e w a T e s f a y e
Full title of the research project	Magnitude and factors associated with lower back pain among nurses working in ICU at selected public hospitals, Addis Ababa, Ethiopia 2024.
Duration of the project	A p r i l t o M a y , 2 0 2 4
S t u d y a r e a	Selected public hospitals in Addis Ababa, Ethiopia.
Source(s) of Funding	St Paul's Hospital Millennium Medical College, Self
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ACKNOWLEDGMENT

I would like to thank the SPHMMC School of Nursing, and the Department of Emergency, and Critical Care Nursing for providing this opportunity. My deepest gratitude goes to my advisors Ms. Rahel N and Ms. Sead A. for their unfailing support, wisdom, and guidance during the research proposal period time and for providing me with valuable comments for structuring the research proposal in a logical and coherent manner. Finally deepest gratitude also goes to everyone supporting me throughout the proposal preparation.

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Abbreviation and acronyms

AACHB – Addis Ababa City Health Bureau

FMOH – Federal Ministry of Health

ICU – Intensive Care Unit

IVD – Intra Vertebral Discs

LBP – lower Back Pain

MSD – Musculoskeletal disorders

SPHMMC – St' Paul' Hospital millennium medical college

USA – United States of America

WHO – world Health Organization

WRMSDs – Work Related Musculoskeletal disorders

ABSTRACT

Background-: Lower Back pain is one of the major prevalent health problems affecting people worldwide and the leading cause of morbidity and mortality that affects individuals working ability at the workplace and general health conditions. Pain or discomfort in the spinal region that is confined between the inferior gluteal folds and the 12th rib, with or without radiating to the lower extremities, is known as low back pain.

Objective: To assess magnitude of low back pain and its associated factors among nurses working in the intensive care unit at selected public hospital Addis Ababa, Ethiopia 2024.

Methods: The study was conducted in Addis Ababa Public Hospitals, Ethiopia, from April to May), 2024, and an institutional-based cross-sectional study design were used. The data were collected by using adapted Standardized musculoskeletal questionnaires for assessing the magnitude of lower back pain. Hospitals were selected using sample random sampling method. The sample size were determined using single population proportion formula with a sample size of 315 nurses. Data was imported into Epi data and exported to SPSS version 26.0 for analysis. A binary logistic regression model was used to fit each variable. Variables having p values <0.25 in the bi variable analysis were included in the final multivariable analysis. A p-value of less than 0.05 and a 95% confidence range was used to indicate significant associations.

Results: With a 95.2% Response rate, 300 study participants participated in this investigation. The mean (SD $\pm$) age of the study participants was 27.8($\pm$ 2.4 years. More than half of the study participants 167(55.7%) gender were male. Sex (AOR = 1.74(95%CI: 1.06, 2.87)), lift high loaded objects more than 20 kg on a daily basis (AOR =1.693(95%:1.028, 2.778)) and prolong standing in patient side (AOR =0.52(95%CI: 0.318, 0.87)) were significantly associated with lower Back pain.

Conclusion & recommendation: The finding of this study showed that the overall prevalence of lower back pain was 65%. Sex, lift high loaded objects more than 20 kg on a daily basis, prolong standing in patient side were significantly associated lower back pain with a p-value of less than 0.05 and confidence interval of 95%.

Key Words: lower back pain, intensive care unit, Nurse

1. Introduction

1.1. Background

Pain or discomfort in the spinal region that is confined between the inferior gluteal folds and the 12th rib, with or without radiating to the lower extremities, is known as low back pain (LBP), LBP is the most common musculoskeletal disorder (MSD) affecting the adult population, with a lifetime prevalence of 60% up to 80% (1).

According to the World Health Organization (WHO), LBP is the leading cause of disability worldwide with a global prevalence of 7.2 and in Europe and the United States, LBP is the most frequently occurring occupational health problem(2).

The symptoms can arise from many potential anatomic sources, such as nerve roots, muscles, fasciae, bones, joints, intervertebral discs (IVDs), and organs within the abdominal cavity(3). Lumbar strain and sprains caused by stretch injury to the tendons, ligaments, or muscles of the lower Back region led to acute or chronic LBP, back injuries can occur because of overuse, improper use or trauma(4).

Healthcare professionals are often at risk of sustaining work related musculoskeletal disorders (WMSDs) during the performance of work duties(5). Nursing personnel, among the occupational groups within the health service, is more vulnerable to LBP. A study in indicates that nursing is one of the riskiest occupations for back pains, and it has the highest incidence of all types of nonfatal work related injuries(6).

Low back pain was linked to a number of factors, including being a woman, getting married, getting older, not exercising regularly, being overweight, working jobs that required a lot of twisting and bending, standing for extended periods of time at work, having insufficient staff, and lifting large weights(7).

Compared to other professions, nurses are more susceptible to low back discomfort due to work-related factors such as activities involving back bending, lifting, tugging objects, and manual patient handling(23). It is the main reason for job losses, workplace adjustments, absenteeism, sick leave, disability, and medical expenses. Resources, significant financial losses and a restriction on every day and social activities due to its intensity (22).

The intensive care unit (ICU) is a specialized hospital ward where patients who are in severe condition receive thorough, precise, and continuous treatment. In order to provide vital care for patients in this ward, nurses are essential(8).

The most often reported work-related musculoskeletal disorder among ICU nurses in China (80.1%) and Korea (90.3%) was low back pain(9). Similarly, 79% of nurses in Turkey reported having symptoms of a musculoskeletal condition (10).

The frequency of long-term pain was discovered to be between 44.1% and 82.7% among nurses in Africa and between 45.8% and 70.9%(8). In Ethiopia Regular exercise to build the muscles in your lower back and abdomen using proper body mechanics It is necessary to use cautious lifting techniques, take breaks from prolonged bending at work, and maintain a healthy lifestyle by giving up smoking and gaining weight in order to reduce the frequency of low back discomfort(4).

1.2. Statement of the problem

Globally prevalence of 1-year LBP in workers was 25% and LBP was the most prevalent issue among health care workers, serious occupational disease and leads to a serious social problem, huge workers' compensation, and a decline in productivity, It is the leading cause of disability globally(11).

LBP problem is associated with occupationally and personal related consequences such as frequent absenteeism and disability(12). Musculoskeletal disorders accounts for about 4.3% of disability life adjusted years (years living with disability) in the developed world, whilst it is reported as accounting for approximately 1% in the developing world. The four major musculoskeletal conditions leading to disability include osteoarthritis, rheumatoid arthritis, osteoporosis, and LBP. The lifetime prevalence of LBP (at least one episode of LBP in a lifetime) in developed countries is reported to be up to 85 %(13).

LBP is one of the top ten conditions that lead to illness and disability, higher than the human immunodeficiency virus, road traffic accidents, tuberculosis, lung cancer, chronic obstructive pulmonary disease, and preterm birth complications(14).

Prevalence rates of female nurses in Bangladeshi LBP that lasted for at least 1 day, chronic LBP, intense pain and sought medical care because of LBP during the last 12 months were 72.9, 31.8, 24.4 and 36.2%, respectively(6).

LBP effect on duty performance to include the inability to care for patients as appropriate, absenteeism at work, intention to change workplace, and intention to quit the nursing profession And Nurses may be forced to quit their jobs or change their workplaces because of LBP additionally, Low back pain directly affects nurses' productivity at work and reduces the overall amount and quality of health care the clients receive also affects the economy of the country adversely due to labor loss of nurses and reduction in work efficiency(15).

In the ICU nurses are frequently required to push, pull, elevet, and bend their patients with help of workers might contribute expreience of lower back pain. LBP prevalence is high and leads to serious health consequence in developed countries; its prevalence among ICU nurse was not well studied as a factor in Ethiopia. Therefore, this study were assess the magnitude and associated factors of low back pain in ICU nurses at selected public hospitals Addis Ababa 2024.

1.3. Significant of the study

Understanding factors that influence the prevalence of lower back pain among health professionals working in public hospitals will help to develop effective strategies to prevent and control work related lower back pains and disability. It could also assist in developing specific intervention for prevention of lower back pain among these professionals intervention would minimize absenteeism from work medical consultation time and cost due to this problem, and morbidity related to this problem.

The finding of this study was revealed data on the magnitude and associated factors of low back pain among intensive care unit nurses at selected public hospitals Addis Ababa. It was identifying factors associated with low back pain is an important input for policy makers and hospital administrative bodies to plan and implement preventive measures aimed at reducing the problem and associated decreased quality of nursing care. It will also help nurses to modify their behaviors that predispose to low back pain to avoid unnecessary personal and medical cost.

2. Literature review

2.1 Prevalence of lower back pain nurses work in ICU

Lower Back pain is one of the major prevalent health problems affecting peoples worldwide and the leading cause of morbidity and mortality that affect individuals working ability at work place and general health condition. A systematic review study conducted reveals in United States the 12-month period prevalence of low back pain lasting 7 days, seeking medical care were 25% (16).

It is also one of the symptoms of Musculoskeletal Disorders as some scholar in their study said that any individual can have 80% risk of to be affected throughout his life and almost 20-30% of all peoples at any time. Across sectional study reveals that 60-90% Europeans peoples will at risk of developing LBP in their life and any one in time 15% - 42%(17).

The study conducted in Taiwan Based on the subjects' reports on the previous twelve months, the prevalence rates for pain lasting for at least one day, seeking of medical care, intense pain, sick leave, and chronic pain were 66.0%, 43.9%, 38.1%, 10.7%, and 8.6%, respectively(17). Meta-analysis studies in Iran 154 studies were included in the study for analysis. The estimated lifetime prevalence of lower back pain in health care personnel was 54.8%(6).

The study conducted in Nepal prevalence of low back pain of one year was 60%(15). Research done in southwestern Saudi Arabia among 740 participants the overall prevalence of LBP in the past 12 months was 73.9% from these LBP with neurological symptoms, LBP necessitating medications and/or physiotherapy, LBP requiring medical consultation was found to be 50.0%, 40.5% and 20 % respectively(18).

In the study of Jaddeh Saudi, approximately 85% of the nurses reported experiencing at least one musculoskeletal symptom. Musculoskeletal symptoms occurred most commonly in the lower back (65.7%), ankles and feet 41.5%, and shoulders 29%(12).

The study worked in Saudi king Adulaziz university hospital shows that Cumulative prevalence of LBP was (82.9%), annual prevalence was (85.5%)(19). Nurses working in surgical wards had higher prevalence of LBP. About 24.7% of them changed their working unit, hospitalization was necessary for 11.9%, and 39.8% sought medical care(13).

Studies on nurses in Saudi's identified lowest and the highest prevalence among the studies were found to be 53.4 % and 85.9%.(13) Research in Malaysia showed that (76.5%) nurses included in the study suffered from LBP at a point of time(2). Study in Nigerian Hospital among Four hundred and eight respondents in the study. The 12-month prevalence of LBP was 300 (73.53%).

LBP was more prevalent among female nurses (68%) than the male nurses (32%)(20). Studies in southwest Nigeria reveals 84% of the nurses have had WMSDs once or more in their occupational lives. The 12-months period and point prevalence rate of WMSDs at anybody region was 78% and 66.1% respectively. WMSDs occurred mostly in low back (44.1%), neck (28.0%), and knees (22.4%). 30.3% treated themselves or had visited other health practitioners for care. (21).

Study was conducted among intensive care unit nurses in Amhara region Ethiopia reported 76% of nurse suffered from LBP at the point(2).

2.2 Factors Associated with Lower back pain

A review of literatures on the topic of lower back pain among ICU nurses reveal several potential factors associated with this issue. One major factor is a physical demands of the job, including frequent lifting and transferring of patients, as well as long periods of standing and waking. Additionally, the lack of proper equipment and infrastructure in the ICU may contribute to the development of lower back pain among nurses.(22)

The risk factors varied with different measures of LBP, at least one high risk patient handling task were observed to be associated each LBP related measure including manual transfer of patients between bed/wheelchair and bath cart, perceived physical exertion, were consistently associated with different measures of LBP. Besides, age was found to be associated with an increased risk of only chronic pain(8).

Study in Iran showed that the adjusted odd ratio estimated were as : age, female gender, BMI , lack of regular physical activity occupational factors , patient related factors , body position at work , and stress significant associated with lower back pain (6).

Researches done in south western Saudi Arabia the risk factors were identified: working in secondary and tertiary hospitals, increased BMI and positive history of over exertion back trauma. On the other hand, practicing regular physical exercise was a significant protective factor(12).

The study done in Saudi king Abdul-Aziz university hospital states that manual lifting of patients is significantly associated factor with and working in surgical wards had higher prevalence of LBP than other units(13).

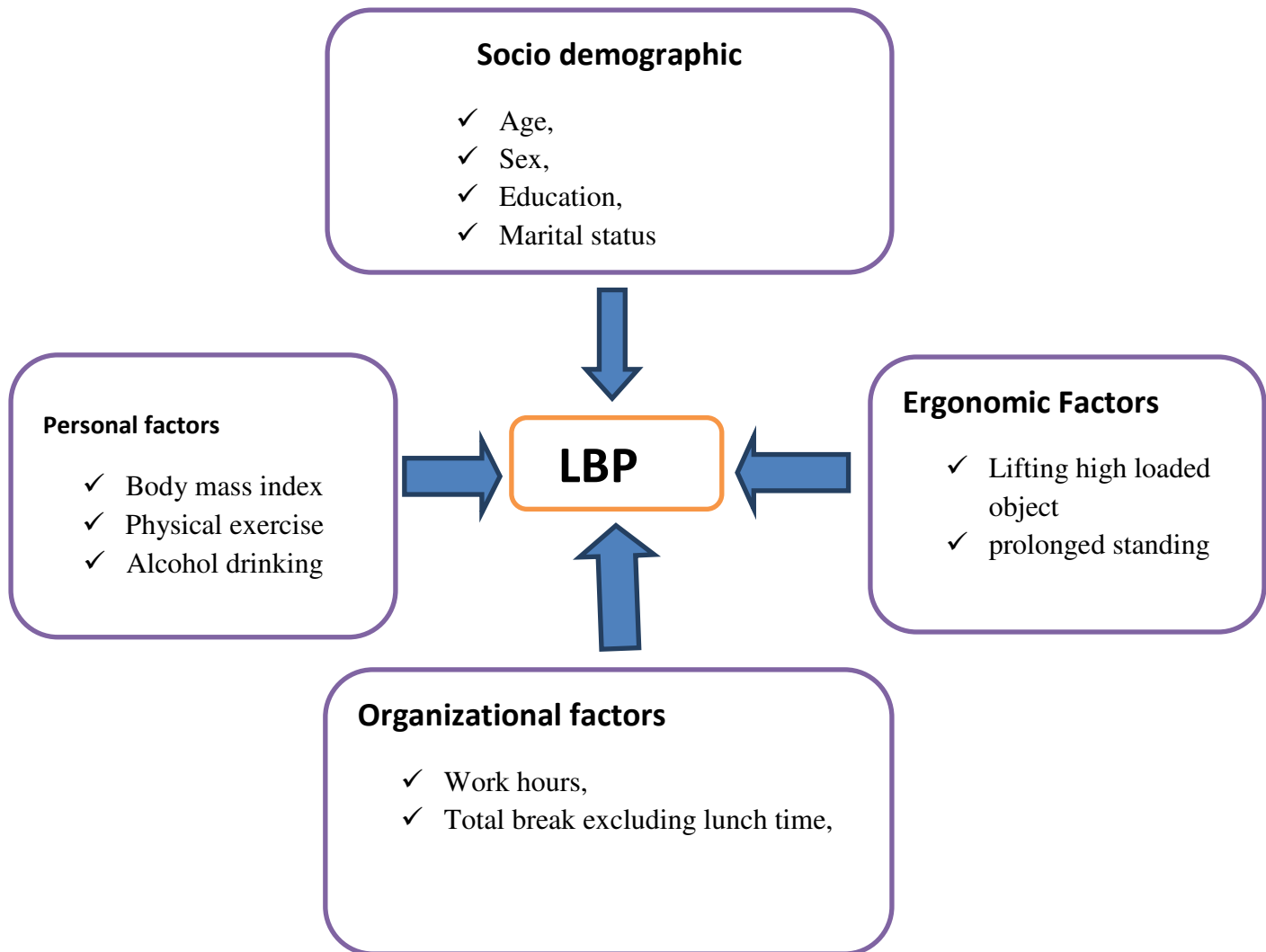
A study conducted in Malaysia among nurse suggested that age, working in an ICU for ≥ 5 years, frequent lifting of heavy patients, twisting during patient care, lack of regular physical activity and smoking were found to be determinants of LBP(2).

The study conducted in Nigeria shows Nurses who join the work long ago, being female ,lifting high loaded object standing on duty and moving heavy equipment's, carryout bedside procedure associated with LBP(23).

The study conducted in Amhara region reveal being female unavailability of assistive device for patient handling, lack of training on intensive care, lack of regular exercise and job stress were factors significantly associated with low back pain(4).

2.3. Conceptual Framework

After reviewing different studies on Magnitude and factors associated with lower back pain among nurses working in ICU the following conceptual framework was adapted.



\ **Figure 1-2-1. Conceptual framework Magnitude and factors associated with lower back pain among nurses working in ICU at selected public hospitals, Addis Ababa, Ethiopia 2024.**

3. Objectives

3.1. General objectives

To assess magnitude of low back pain and its associated factors among nurses working in intensive care unit at selected public hospitals in Addis Ababa, Ethiopia 2024.

3.2. Specific objectives

- To determine the magnitude of low back pain among nurses working in intensive care unit at public hospitals in Addis Ababa, Ethiopia 2024.
- To identify factor associated with lower back pain among nurses working in intensive care unit at public hospitals in Addis Ababa, Ethiopia 2024.

4. Methods

4.1. Study Area and period

The study was conducted at public hospital, in Addis Ababa, Ethiopia from April to May 2024. Addis Ababa is the capital and largest city of Ethiopia. It has eleven sub cities. There are a total of 14 Public Hospitals in the city which are controlled by two governmental authorities; under Federal Ministry of Health (FMOH) there are five public hospitals and under Addis Ababa City Health Bureau (AACHB) there are seven public hospitals. Among these hospitals the study were conducted on five simple randomly selected public hospitals these are St. Peter specialized hospital, with 267 staff nurses and 271 beds, is a prominent tuberculosis hospital in Ethiopia and is known for its services related to cardiac disease St. Paul's Hospital Millennium Medical College (SPHMMC) located in the Gulele sub-city, is one of the largest public hospitals. Established in 1968, it is governed by a board under the Federal Ministry of Health. According to the college's website, SPHMMC has more than 2,800 clinical and non-clinical staff with an average inpatient capacity of over 700 beds. The hospital serves an average of 1,200 emergency and outpatient clients daily (28) and Ras Desta Hospital, Yikatit 12 Referral hospital, with 272 beds and 480 staff nurses ((27), and Menelik II Referral Hospital, the first established hospital in the healthcare development history of Ethiopia, is the sole specialized eye care service provider for patients in the country, employing 376 staff nurses ((27).

4.2. Study Design

An institutional cross-sectional study was done.

4.3. Source population

All ICU nurses who works in public hospitals in Addis Ababa, Ethiopia.

4.4. Study population

Nurses working Intensive care unit at selected Public Hospitals.

4.5. Sample Size Estimation

The sample size was determined by using formula for estimating a single population proportion by assuming confidence interval (CI) of 95%, degree of precession taken as 5% and Proportion

taken as 76% from magnitude of low back pain and associated factors among nurses who work at intensive care units in Amhara region public hospitals, North Ethiopia(4).

The formula is:

$$(Z_{\alpha/2})^2 p (1-p) / d^2$$

Where n=sample size

Z=confidence interval 95%=1.96

P=Proportion=76%=0.76

d=margin of error =5%=0.05

n= is the minimum required sample size.

$$n = (Z_{\alpha/2})^2 p (1-p) / d^2$$

$$n = (1.96^2)(0.76)(1-0.76)/(0.05)^2$$

$$n = 286$$

Non-response rate of 10%, which is 28.6=29

$$n = 286 + 29 = 315$$

4.6. Sampling techniques

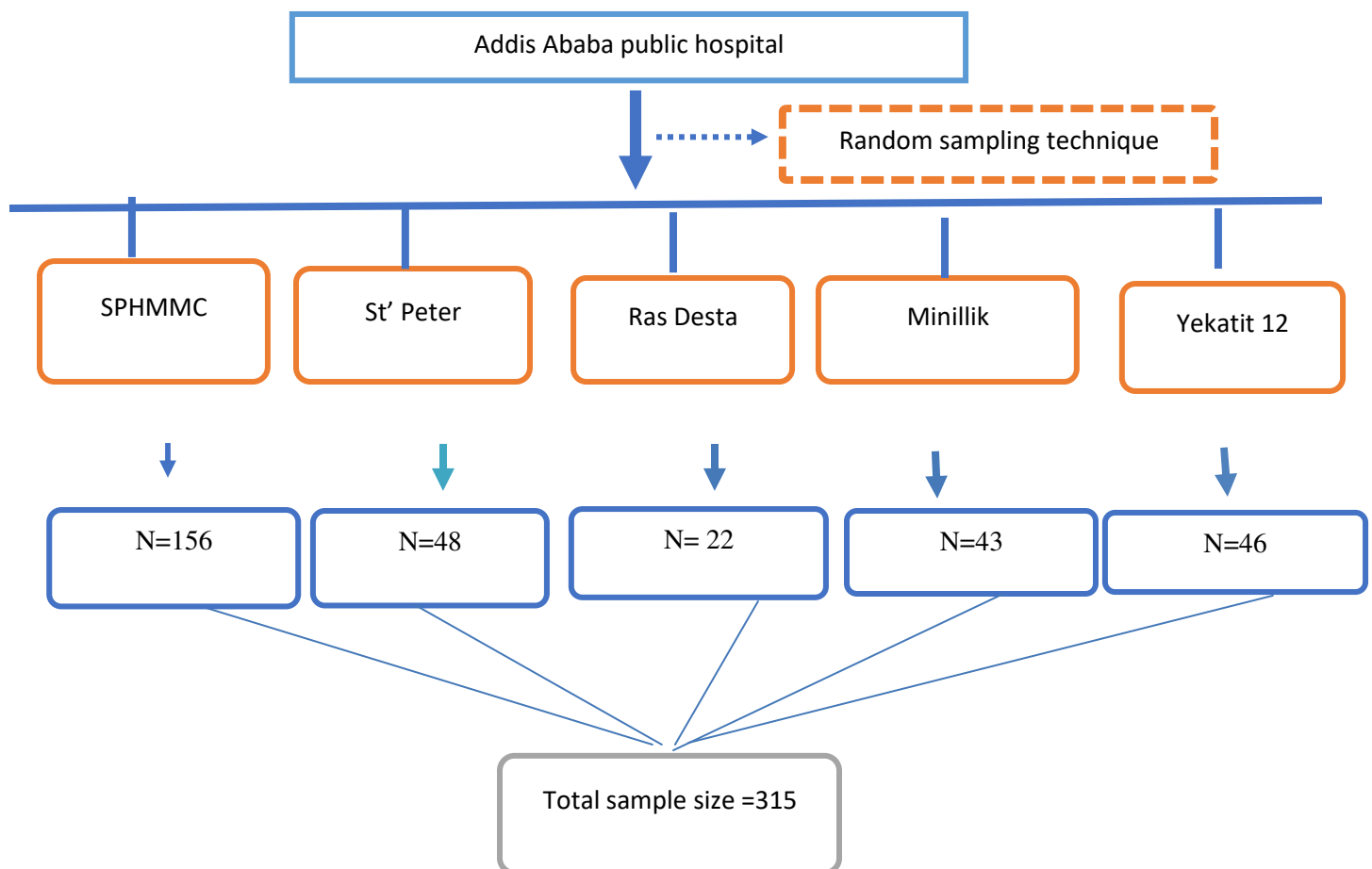


Figure 2-0-1 :Schematic diagram of sampling procedure magnitude of low back pain and its associated factor among nurses working in intensive care unit at selected public hospitals in Addis Ababa, Ethiopia 2024.

4.7. Eligible criteria

4.7.1. Inclusion criteria

Nurses who had 6 month and above of service were included in the study,

4.7.2. Exclusion criteria

Nurse who had lower back pain and trauma history before starting to work in ICU

Nurse who are pregnant during data collection period.

4.8. Study variable

4.8.1. Dependent variable

Lower back pain

4.8.2. Independent Variables

Socio demographic factors (Age, sex, Education and marital status)

Organizational factors (working hours, total break excluding lunch time, health and safety training, high loaded work)

Personal and lifestyle factors (Body mass index, physical exercise, alcohol drinking and smoking)

Ergonomic factors (Lifting high loaded object)

4.9. Operational Definition

Low back pain (LBP) is any back pain spreading into the buttocks, thighs, and foot and reduced range of motion. LBP classifies as:

Mild LBP: Pain intensity on numeric scale score of 1–3 [9].

Moderate LBP: Pain intensity on numeric scale score of 4–6 [9].

Severe LBP: Pain intensity on numeric scale score of 7–10 [9].

Prolonged standing, standing more than one hour without moving from the workstation and standing more than four hours a day.(24)

Regular exercise: Performing physical activity three days/week for 20–30 minutes duration [22]

Alcohol drinking: it is a consumption of any kind of alcohol by health worker at least for three times per week for different purpose.

Body mass index: weight in kilograms divided by the square of height,

BMI: <18.5 underweight, 18.5 to 24.5 normal and >25 overweight or obese (23)

4.10. Data collection method and tool

4.10.1. Data collection tool

The data were collected by using adapted standardized musculoskeletal questionnaires for assessing magnitude of lower back pain. It is repeatable, sensitive, and useful as a screening and surveillance tool for musculoskeletal disorders including Lower Back Pain. The purpose of the questionnaire is to evaluate related variables, such as socio demographic traits, organizational variables, lifestyle factors and ergonomic variables, in order to estimate the extent of lower back pain among medical professionals. The study participants were given questionnaires to complete and return the following day in order to collect data through an interview technique. A standardized English-language questionnaire was used, and data collectors with training was oversee it. After the training is given, pretest was conducted on 5% of the sample size in other hospital. Pretest was conducted on 20 participants prior to the main study in Zewditu Memorial Hospital to ensure the consistency and validity of the tool and then correction was made accordingly before the actual data collection. Data was collected with 5 trained degree graduate nurses professionals and two supervisors graduated with MSc.

4.10.2. Data collection technique

Each case collects using a data collection tool and review by principal investigator. Data were check for completeness in the questionnaires. Each questionnaire was coded, stored in appropriate area, and checked for completeness by principal investigator during and after data collection.

4.10.3. Data quality control and assurance plan

The quality of data was checked before, during and after the data collection. Training was given for data collectors based on preparation of training manuals and how to use field guiding, procedure of data collection and review of key terminologies and ethical issue of the study were discuss in detail by principal investigator and prior to the actual data collection. During data collection period, the collected data were check for completeness and for its consistencies by the principal investigator and supervisors.

4.11. Data processing and analysis plan

The association between the outcome variable (lower back pain) and the independent factors (socio demographic, organizational, lifestyle, ergonomics) were measured using an odds ratio with a 95% confidence interval after the data has been cleaned, coded, and input into the SPSS version 26 software program for analysis. Frequency tables, graphs, percentages, and proportions with a 95% confidence level were used to convey the descriptive data for the first particular target and summarize of the organizational, lifestyle, ergonomic and socio demographic elements. To determine the contributing variables to lower back pain is the second particular purpose. The crude odds ratio (COR) with 95% confidence interval (CI) with $P < 0.05$ were utilized in binary logistic regression model used in the research. Bivariable logistic regression first to identify factors to enter in to the second step of analysis which is multivariable logistic regression to investigate whether there is a significant relationship between the independent variables and the outcome variable.

Dissemination plan

The finding of this study will be presented to St. Paul's hospital millennium medical college department of Nursing and the finding will be disseminated to the selected public Hospitals, Addis Ababa Health Bureau, and Ministry of Health. In addition, the hard copy of the research will be kept in SPHMMC library. Additionally, an attempt will be made for publication of the study finding in reputable journals.

4.12. Ethical consideration

The study was carried out after Ethical approval is obtained from SPHMMC . Before data collection written consent were obtained from respect participants after a necessary explanation about the purpose, benefit, and risk of the study and also their right on decision of whether or not participating in the study and the privacy of any information given by the participant was Concerning confidentiality rather than name of respondents ‘was code used in the questionnaire.

5. Result

5.1. Socio demographic characteristics of the Participants

Three hundred study participants were included in this study with the response rate of 95.2%. The mean (SD $\pm$) age of the study participants was 27.8($\pm$ 2.4). Around half of the study participants 167(55.7%) gender were male. Regarding to educational status more than half of the participant 179(59.7%) were BSc and 60(20%) was MSc.

Regarding to marital status about half of study participants 147(49%) was married. Majority of participant Monthly gross incomes were 192(64%) less than 10000 birr. (Table 1).

Table 1 Socio demographic characteristics factors associated with lower back pain among nurses working in ICU in Addis Ababa public hospitals, Ethiopia 2024. (N=300).

v a r i a b l e s					
A g e (i n y e a r s)					
m e a n S D					
2 7 . 8 4 2 . 4 1 2					
category Frequency (%) Percent (%)					
S e x o f p a r t i c i p a n t	M a l e	1	6	7 5 5 . 7	
	F e m a l e	1	3	3 4 4 . 3	
M a r i t a l s t a t u s	S i n g l e	1	5	3 5	1

E d u c a t i o n a l s t a t u s	married	1	4	7	4	9
	diploma	6		1	2	0 . 3
	B S c	1	7	9	5	9 . 7
	M S c	6		0	2	0
Monthly gross incomes (in Birr)	< 10000	1	9	2	6	4
	>= 10000	1	0	8	3	6

5.2 Personal and lifestyle factors

76 (25.3%) of participants have no habit of physical exercise. The majority of participants, 182 (60.7%) Were only 1- 2 days doing physical exercise per week. 20(69%) of participants did not drink alcohol. Majority of participant, 241(80.3%) had healthy BMI (1.7%) of participants were obese, 42 (14%) of participants were overweight, and 12(4%) of participants were underweight.

Table 2 Personal and lifestyle factors associated with lower back pain among nurses working in ICU in Addis Ababa public hospitals, Ethiopia 2024. (N=300).

v a r i a b l e	c a t e g o r y	Frequency (%)	Percent (%)
Do you have habit of doing physical exercise	N o	7	6 2 5 . 3
	Y e s	2 2	4 7 4 . 7
if yes, above question how often per week	1- 2 d a y s	1 8	2 6 0 . 7
	> 3 d a y s	1 1	8 3 9 . 3
B M I	< 1 8 . 5	1 1	2 4
	18.5 - 24.9	2 4	1 8 0 . 3
	25 - 29.9	4	2 1 4
	> 3 0	5	1 . 7
D o y o u c u r r e n t l y d r i n k a l c o h o l	Y e s	9	3 3 1
	N o	2 0	7 6 9
If yes above question, how much do you drink alcohol per week	< 5 g a s s	2	4 2 5 . 8
	> 5 g a s s	6	9 7 4 . 2

5.3 Organizational and Occupational factors

Regarding to working hours, 211(70.3%) of participant were work 8 hours per day. Majority of participant, 204(68%) were work less than 40 hours per week. from total participants 167(55.7%) were had greater than 1 hour work break time.

Table 3 Personal and lifestyle factors associated with lower back pain among nurses working in ICU in Addis Ababa public hospitals, Ethiopia 2024. (N=300).

v a r i a b l e	category	Frequency (%)	Percent (%)
How many hours do you mostly work per day?	8 h r s	211	70.3
	> 8 h r s	89	29.7
How many days do you mostly work per week	<40hrs	204	68
	>=40hrs	96	32
w o r k i n g b r e a k t i m e	1 h r	133	44.3
	> 1 h r	167	55.7

5.4 Ergonomics factors

More than half of participants, 158 (52.7%), were lifting high loaded object. a total participants about 181 (60.3%) were lift more than 20 kg on a daily basis. The majority of participants (60.3%) were prolonged standing in patient side. More than half of the participants (53.3 %) were got training related to Occupational Health and safety in the Past 12 months.

Table 4: Personal and lifestyle factors associated with lower back pain among nurses working in ICU in Addis Ababa public hospitals, Ethiopia 2024. (N=300).

V a r i a b l e	category	Frequency (%)	Percent (%)
Have you frequent Lifting high loaded object	Y e s	158	52.7
	N o	142	47.3
Do you lift high loaded objects more than 20 kg on a daily basis	Y e s	181	60.3

	N	o	1	5	8	5	2	.	7	
Do you prolong standing in patient side?	Y	e	s	1	8	1	6	0	.	3
	N	o	1	1	9	3	9	.	7	
Have you got any training related to	Y	e	s	1	3	9	4	6	.	3
occupational Health and safety in the	N	o	1	6	1	5	3	.	7	
P a s t 1 2 m o n t h s										

5.6 Prevalence of low back pain

In this study, the overall prevalence of low back pain in the last 12 months was 65% .the prevalence was substantially higher among women (55.7%) than men. It was stated that prolonged standing was the most probable cause of low back pain among nurses (60.3%). The duration of low back pain extended up to 1-3days (46.7%) of the nurses. Around (31.7%) of nurse were absent greater than five days from work in the past 12 month due to low back pain. About **60.5%** of the nurses reported that they had pain spread down blow their knee during the past12 month. Majority (**55.4%**) of the nurses lower back pain, were started Gradual. About 44.6 % immediate cause of lower back pain on first onset were during object moving. It was reported that factors mainly increase the lower back pain were moving objects 36.4%.

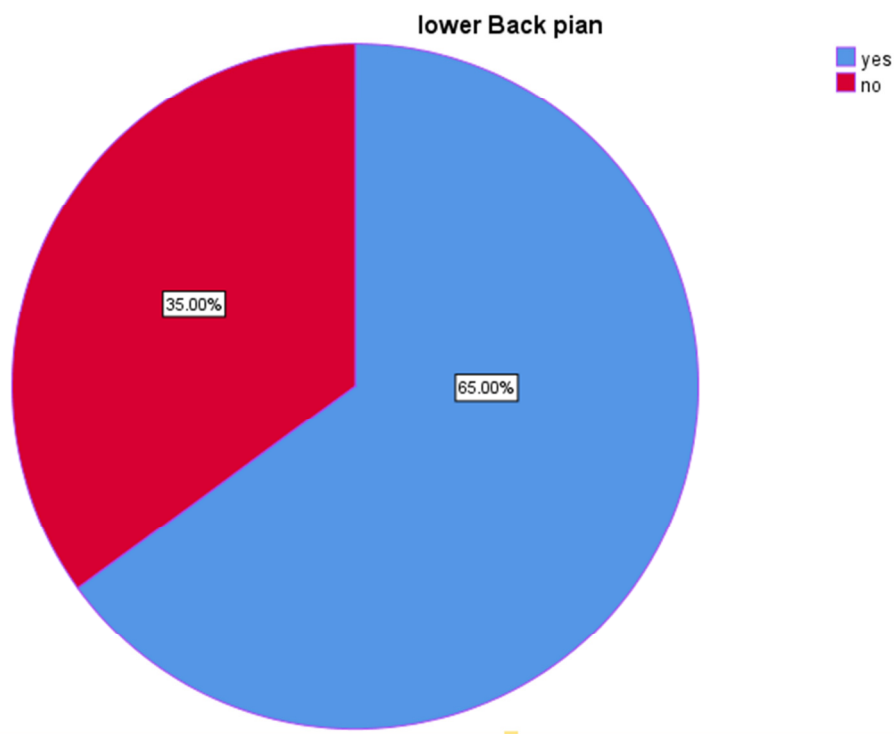


Figure 0-3 Prevalence of low back pain among nurses working in ICU in Addis Ababa public hospitals, Ethiopia 2024. (N=300).

Table 5 lower back pain among nurses working in ICU in Addis Ababa public hospitals, Ethiopia 2024. (N=300).

5.6. Factors associated with lower back pain among nurses working in ICU

v a r i a b l e	c a t e g o r y	Frequency(n)	Percent (%)
Have you had lower back pain in the area between 12th ribcage and pelvic region during the past 12 month which lasts a day	Y e s	195	65
	N o	104	34.7
Is yes, for how many days it lasts in total during the past12 month th	1 - 3 d a y s	140	71.8
	> 3 d a y s	55	28.2
If yes above question, for how many days it lasts in total during the past12 month this lower back pain?	1 - 3	63	32.3
	4 - 7	64	32.8
	7 - 10	66	34.9
For how many days in total have you absent from work in the past 12 month due to low back pain?	1 - 5 d a y s	10	5.1
	> 5 d a y s	94	48.8
Has the pain spread down your leg to blow your knee during past 12 month	Y e s	11	6.0
	N o	77	39.5
How was the nature of lower back pain, when started you for the first time?	G r a d u a l	10	5.4
	S u d d e n	84	44.6
Have you remembered the immediate cause of lower back pain on first onset	moving object	87	44.6
	Twisting	73	37.4
	bent forward	11	5.6
	caring pt.	13	6.8
	O t h e r	11	5.6
Which factors mainly increase the lower back pain in your activities	moving objects	71	36.4
	twisting at work	29	14.9
	bent forward	34	17.4
	caring pt.	30	15.3
	O t h e r	31	15.9
Which factors mainly relieving back pain in your activities?	W a k i n g	21	10.2
	S t a n d i n g	19	9.7
	S i t t i n g	97	49.7
	Laying down	46	23.5
	side seep	31	15.9

In binary logistic regression showed that sex, habit of doing physical exercise, lift high loaded objects more than 20 kg on a daily basis, prolong standing in patient side training related to, occupational Health and safety in the Past 12 months were significantly associated with lower back pain at p value less than 0.25. In addition, those variables significantly associated with

lower back pain candidates for multivariable logistic regression analysis with a p-value of less than 0.25 (Table 6).

According to a multivariable logistic regression model, sex, lift high loaded objects more than 20 kg on a daily basis, prolong standing in patient side were significantly associated with lower back pain with a 95% confidence interval and a p-value less than 0.05 (Table 4).

Sex(AOR = 1.74(95%CI: 1.06, 2.87)), lift high loaded objects more than 20 kg on a daily basis (AOR =1.693(95%:1.028, 2.778)) and prolong standing in patient side (AOR =0.52(95%CI: 0.318, 0.87)) were significantly associated with lower back pain (Table 6).

Table 6: Multiple logistic regression factors associated with lower back pain among nurses working in ICU in Addis Ababa public hospitals, Ethiopia 2024. (N=300).

v a r i a b l e	L o w e r B a c k p a i n				C O R (9 5 % C I)	A O R (9 5 % C I)	P v a l u e
		y e s	N o				
S e x	M a l e	1 1 7	5 0	1		1	
	F e m a l e	7 8	5 5	0.04	1.65(1.023,2.662)	1.747(1.063,2.871)	0.028*
Do you have habit of doing physical exercise	Y e s	1 5 3	7 1	1		1	
	N o	4 2	3 4	0.041	1.744(1.024,2.971)	1.728(0.991,3.01)	0.054
Do you lift high loaded objects more than 20 kg on a daily basis	N o	1 0 1	4 1	1		1	
	Y e s	9 4	6 4	0.036	1.677(1.035,2.717)	1.693(1.028,2.778)	0.039*
Do you prolong standing in patient side	Y e s	1 2 8	5 3	0.011	0.534(0.329,0.865)	0.526(0.318,0.871)	0.012*
	N o	6 7	5 2	1		1	
Have you got any training related to occupational Health and safety in the past 12 months	Y e s	9 8	3 9	1		1	
	N o	9 7	6 6	0.03	1.71(1.052,2.778)	1.6(0.965,2.652)	0.068

NB * P<0.05 significance level **1** reference

COR Crude odds ratio **AOR** Adjusted odds ratio

6. DISCUSSION

Lower back pain is a major cause of disability that affects the quality of life as well as work performance. The high prevalence of low back pain in intensive care unit nurses negatively affect the quality of care in nursing, since patients in the ICU need nurses assistance every minute of their life. In this study, the magnitude of low back pain was 65%, which was highly prevalent. The findings were consistent with Hawassa city, southern Ethiopias study (25), West Wollega Zones, Western Ethiopia(63.6%)(26), Nepal (64.5%)(15). This could be due to using a similar study design and the inherent nature of working conditions and nursing practices is often almost identical in every country.

However, the prevalence of low back pain in this study was lower than different studies, Amhara region (76%)(4), Nigeria (73.5%)(27), Saudi Arabia, (73.9) (28). Malaysia (76.5) (29). The discrepancy might be due to differences in pain reporting culture, lifestyle, and study populations. In this study, the study population was all nurses working in all ICU.

This study found a higher prevalence of LBP compared to that found in Addis Ababa, Ethiopia (45.3%)(25), Southern Ethiopia(44.2%)(30),Oromia Region, South East Ethiopia (42.6%)(31), Iran (54.8%).This discrepancy might be due to differences in the study setting, a difference in sample size and socio-demographic characteristics of study participants, a lifestyle variation between the study populations.

Lower back pain among nurse working ICU was influenced by many factors. The current study identified sex, lift high loaded objects more than 20 kg on a daily basis, prolong standing in patient side with a p-value of less than 0.05.

In this study, females were 1.747 times (AOR = 1.74(95%CI: 1.06, 2.87) more likely to develop low back pain than males. This finding is supported by studies conducted in Amhara region (4)..This is due to physiologically low disk space in females that predispose to low back pain and as age increases in females' estrogen level decreases and collagen wasting occurs, as a result, females might experience low back pain more than males. The physical stress of child-rearing

and premenopausal abdominal weight gain may also contribute to the occurrence of low back pain in females. In the Ethiopian context, women are more likely than men to be exposed to household activities so LBP could be a combination of work and home exposure.

Nurses who were lift high loaded objects more than 20 kg on a daily basis 1.6 (AOR =1.693(95%:1.028, 2.778)) more likely to develop low back pain than who were not. This finding is in line with the study findings from Egypt(32), Makah, Saudi Arabia(33), Ankara, Turkey (34). This reverse association might be due to inappropriate use of body mechanics during weight lifting and it shed light on the importance of some educational intervention programs for nurses on how to lift objects.

Nurses who were not standing prolonged patient side 48% (AOR =0.52(95%CI: 0.318, 0.87)) less likely to develop lower back pain. This finding is in line with the study findings from Gondar(35),Denizil(36). During the prolonged standing period, the displacement/variability of center of pressure, skin temperature, and perceived fatigue and discomfort would increase. The discomfort perceived by the individuals in would be a result of metabolite buildup in the low back muscles. This accumulation of metabolites has been shown to be a potential source of perceived discomfort. Further, due to the static nature of standing, an increase in blood pooling in the low back, and thus an increase in metabolite buildup, may be observed as increased temperature at the skin

7. STRENGTH & LIMITATION OF THE STUDY

7.1 Strength of the study

- ✓ The study used valid standard tool to assess lower back pain
- ✓ A simple random sampling technique with lottery method, which increases the representativeness of the result, was used to recruited participants for the study.

7.2 Limitation

Since the study assesses a one-year prevalence of low back pain, a recall bias might have an effect. The study was based on self-reported data and hence subjective in nature. Study selection could have biased the results because of the fact that those suffering from LBP might have left from ICU or changed to other jobs, prior to data collection. The respondents were unable to state about time spent doing activities like lifting, transfers, bending, sitting and standing. The questionnaire did not include recreational activities and LBP might have been aggravated or ameliorated by other activities such as exercise and household. The study design employed to address the study's aims does not show a cause-and-effect relationship between the outcome and independent variables.

8 .CONCLUSION AND RECOMMENDATION

8.1 CONCLUSION

This study assessed the magnitude and factors associated with lower back pain among nurses working in ICU in Addis Ababa public hospitals, Ethiopia 2024. The prevalence of low back pain among intensive care unit nurses in was found to be high (67.5%). Being female, lift high loaded objects more than 20 kg on a daily basis, prolong standing in patient side significantly associated with low back pain a p-value of less than 0.05 and 95% confidence interval..

8.2 Recommendation

Finally based on the findings the following recommendations are forwarded:

- ✓ Periodic and continuous risk assessment of low back pain among nurses worked in ICU should be implemented by authorized personnel
- ✓ Organizational policies for preventing low back pain for nurses in ICU should be planned and implemented such as prolonged standing.
- ✓ Intensive care units should have specialized equipment that help nurses to overcome specific risk factors such as electronic adjustable beds and lifts.
- ✓ Nurses should be taught on the importance of weight management and physical fitness in preventing LBP.

9. References

1. Jegnie M, Afework M. Prevalence of Self-Reported Work-Related Lower Back Pain and Its Associated Factors in Ethiopia: A Systematic Review and Meta-Analysis. *J Environ Public Health*. 2021;2021:6633271.
2. Ibrahim MI, Zubair IU, Yaacob NM, Ahmad MI, Shafei MN. Low back pain and its associated factors among nurses in public hospitals of Penang, Malaysia. *International journal of environmental research and public health*. 2019;16(21):4254.
3. Kazemi SS, Tavafian SS, Hiller CE, Hidarnia A, Montazeri A. The effectiveness of social media and in - person interventions for low back pain conditions in nursing personnel (SMILE). *Nursing Open*. 2021;8(3):1220-31.
4. Tefera BZ, Zeleke H, Abate A, Abebe H, Mekonnen Z, Sewale Y. Magnitude and associated factors of low back pain among nurses working at intensive care unit of public hospitals in Amhara region, Ethiopia. *PLoS One*. 2021;16(12):e0260361.
5. Lee S, Heo S, Lee J-Y. A pilot study to assess a risk of a high-risk group of low back pain membership in workers who perform the manual material handling tasks. *Annals of Occupational and Environmental Medicine*. 2021;33.
6. Rezaei B, Mousavi E, Heshmati B, Asadi S. Low back pain and its related risk factors in health care providers at hospitals: A systematic review. *Annals of Medicine and Surgery*. 2021;70:102903.
7. Sanjoy SS, Ahsan GU, Nabi H, Joy ZF, Hossain A. Occupational factors and low back pain: a cross-sectional study of Bangladeshi female nurses. *BMC Research Notes*. 2017;10(1):1-6.
8. Feng C-K, Chen M-L, Mao I-F. Prevalence of and risk factors for different measures of low back pain among female nursing aides in Taiwanese nursing homes. *BMC musculoskeletal disorders*. 2007;8:1-9.
9. Belay MM, Worku A, Gebrie SA, Wamisho B. Epidemiology of low back pain among nurses working in public hospitals of Addis Ababa, Ethiopia. *East and Central African Journal of Surgery*. 2016;21(1):113-31.
10. Ahmed AR. Prevalence of low back pain in working nurses in Zagazig University Hospitals: an epidemiological study. © 2014 Egyptian Society for Rheumatology and Rehabilitation 1110-161X. 2014.
11. Organization WH. Low Back Pain: Priority medicines for Europe and the world. 2013.
12. Attar SM. Frequency and risk factors of musculoskeletal pain in nurses at a tertiary centre in Jeddah, Saudi Arabia: a cross sectional study. *BMC research notes*. 2014;7:1-6.
13. Almaghrabi A, Alsharif F. Prevalence of low back pain and associated risk factors among nurses at king abdulaziz university hospital. *International Journal of Environmental Research and Public Health*. 2021;18(4):1567.
14. Yang S, Lu J, Zeng J, Wang L, Li Y. Prevalence and risk factors of work-related musculoskeletal disorders among intensive care unit nurses in China. *Workplace health & safety*. 2019;67(6):275-87.
15. <gebanath,+46-52+Prevalence+And+Contributing+Factors+Of+Low+Back (5).pdf>.
16. Ferguson SA, Merryweather A, Thiese MS, Hegmann KT, Lu ML, Kapellusch JM, et al. Prevalence of low back pain, seeking medical care, and lost time due to low back pain among manual material handling workers in the United States. *BMC Musculoskelet Disord*. 2019;20(1):243.

17. Mehrdad R, Shams-Hosseini NS, Aghdaei S, Yousefian M. Prevalence of low back pain in health care workers and comparison with other occupational categories in Iran: a systematic review. *Iranian journal of medical sciences*. 2016;41(6):467.
18. Lela M, Frantz JM. Physical activity among nurses in Kanombe Military Hospital. *African Journal of Physiotherapy and Rehabilitation Sciences*. 2012;4(1-2):63-6.
19. Jeyakumar AK, Segaran F. Prevalence and risk factors of low back pain and disability index among operating room nurses. *Journal of Perioperative Nursing*. 2018;31:21-4.
20. Sikiru L, Hanifa S. Prevalence and risk factors of low back pain among nurses in a typical Nigerian hospital. *African health sciences*. 2010;10(1):26.
21. Tinubu BM, Mbada CE, Oyeyemi AL, Fabunmi AA. Work-related musculoskeletal disorders among nurses in Ibadan, South-west Nigeria: a cross-sectional survey. *BMC Musculoskeletal disorders*. 2010;11:1-8.
22. Ovayolu O, Ovayolu N, Genc M, Col-Araz N. Frequency and severity of low back pain in nurses working in intensive care units and influential factors. *Pakistan journal of medical sciences*. 2014;30(1):70.
23. Farooq1 MA, LMA, HAM, , Mustapha4 GA. Work-Related Risk Factors for Lower Back Pain Among Nurses IOSR Journal of Nursing and Health Science (IOSR-JNHS) 4(3 Ver. V (May. - Jun. 2015)):20-5.
24. <Prolonged_constrained_standing_at_work.pdf>.
25. Banga D, Samuel T, Yihune M, Bekele G, Molla E, Borie YA, et al. Prevalence of low back pain and associated factors among nurses working in public hospitals of Hawassa city, southern Ethiopia: A cross-sectional study. *Heliyon*. 2024;10(9):e30300.
26. Mekonnen TH. Work-Related Factors Associated with Low Back Pain Among Nurse Professionals in East and West Wollega Zones, Western Ethiopia, 2017: A Cross-Sectional Study. *Pain Ther*. 2019;8(2):239-47.
27. Tinubu BM, Mbada CE, Oyeyemi AL, Fabunmi AA. Work-related musculoskeletal disorders among nurses in Ibadan, South-west Nigeria: a cross-sectional survey. *BMC Musculoskelet Disord*. 2010;11:12.
28. Alnaami I, Awadalla NJ, Alkhairy M, Alburidy S, Alqarni A, Algarni A, et al. Prevalence and factors associated with low back pain among health care workers in southwestern Saudi Arabia. *BMC Musculoskelet Disord*. 2019;20(1):56.
29. Ibrahim MI, Zubair IU, Yaacob NM, Ahmad MI, Shafei MN. Low Back Pain and Its Associated Factors among Nurses in Public Hospitals of Penang, Malaysia. *Int J Environ Res Public Health*. 2019;16(21).
30. Gashawbeza B, Ezo E. Prevalence and factors associated with low back pain among health care providers in public hospitals of Gamo zone, Southern Ethiopia. *SAGE Open Med*. 2022;10:20503121221114311.
31. Ayane D, Takele A, Feleke Z, Mesfin T, Mohammed S, Dido A. Low Back Pain and Its Risk Factors Among Nurses Working in East Bale, Bale, and West Arsi Zone Government Hospitals, Oromia Region, South East Ethiopia, 2021 -Multicenter Cross-Sectional Study. *J Pain Res*. 2023;16:3005-17.
32. El-Soud AMA, El-Najjar AR, El-Fattah NA, Hassan AA. Prevalence of low back pain in working nurses in Zagazig University Hospitals: an epidemiological study. *Egyptian Rheumatology and Rehabilitation*. 2014;41(3):109-15.

33. Bin Homaïd M, Abdelmoety D, Alshareef W, Alghamdi A, Alhozali F, Alfahmi N, et al. Prevalence and risk factors of low back pain among operation room staff at a Tertiary Care Center, Makkah, Saudi Arabia: a cross-sectional study. *Ann Occup Environ Med.* 2016;28:1.
34. Tierney AJ. Editor's Choice. *Journal of Advanced Nursing.* 2009;65(3):463-.
35. Negash NA, Tadele A, Jember Ferede A. Prevalence and Associated Factors of Low Back Pain Among Healthcare Professionals at University of Gondar Comprehensive and Specialized Hospital, Northwest Ethiopia: Cross-Sectional Study. *J Pain Res.* 2022;15:1543-52.
36. Simsek S, Yagci N, Senol H. Prevalence of and risk factors for low back pain among healthcare workers in Denizli. *Agri.* 2017;29(2):71-8.

10. Annexes

Annex I: ENGLISH VERSION PARTICIPANT'S INFORMATION SHEET

Hello my name is -----I am here on behalf of Menilshewa tesfaye , post graduate student from SPHMMC I am member of research team on cross sectional study of the magnitude of Lower Back Pain and its Associated Factors among ICU nurse, requesting you to participate in this study which would require your response to an interview on some related issues.

Title of the study: Lower Back Pain and its Associated Factors among ICU nurses working in public hospital Addis Ababa, Ethiopia.2024

Objective: The objective of the study is to assess the magnitudes of Lower back Pain and its associated factors among ICU nurse working in selected public hospitals of Addis Ababa, Ethiopia, 2024. Duration of interview: This study will be Confidential: to establish secured safeguards of the confidentiality of research data, your name will not be written in this form and all information given by you will be kept strictly confidential.

Benefit of the study: The research does not have a short term financial, health care and capacity building benefit to the research participant as an individual or as a group but in the long run it will help the concerned organization and policy makers to have a policy consideration and direction and formulation of strategy and design of occupational health and safety programs based on the recommendations and the findings.

Risk and /discomfort of the study: The study has no risk for the participants. Right of the participant: Participating and not participating is the full right and participants can stop from participation in the study at any time. This would have no effect at all on your health benefit or other administrative effect and nobody will enforce you to explain the reason of withdrawal. Participant can skip question which the worker doesn't want to respond. Person to Contact: The participant has the right to ask information that is not clear about the research context and content before and or during the research work. You can contact the principal investigator and his advisor. Moreover, this research will undergo ethical reviewed and approved by SPHMMC The main task of this board is to make sure that the ethical principles is adhered or not and the research participants are protected from harm.

Annex II: INFORMED CONSENT FORM

Title of the study: Lower Back Pain and its Associated Factors among ICU nurse working in public hospital Addis Ababa, Ethiopia. 2024

I have been well aware of that this research undertaking is a post graduate degree partial fulfillment of research thesis which is fully supported and coordinated by SPHMMC, and the designate investigator is Menilshewa Tesfaye. I have been fully informed in the language I understand about the research project objective is to assess magnitudes of lower back pain and its associated factors among ICU nurses. I have been informed that all the information I shall provide to the interviewer will be kept confidential. I understood that the research has no risk. I also knew that I have the right to withhold information, skip questions to answer or to withdraw from the study any time I have acquainted nobody will impose me to explain the reason of withdrawal. It is also enlightened there would have no effect at all in my health benefit or other administrative effect. If you want more information and check about this study, you can contact through the following address. Investigator: Menilshewa Tesfaye Tel: 0929523098 (Mobile). I have read this form, or it has been read to me in the language I comprehend and understood the condition stated above, therefore, I am willing and confirm my participation by signing the consent. Agreed to participate in the study: Yes /No (mark one of them for verbal consent)

Signature _____ (if written consent) Name of witness
signature_____ (Data collector, supervisor, any third person) Signature
_____ Date_____

ANNEX III- QUESTIONNAIRE- ENGLISH VERSION

Code _____

Part 1: Respondent's personal information

Interview Date __/__/____

S. no	Q u e s t i o n / v a r i a b l e	A n s w e r	S k i p
101	How old are you in a completed year?	1. _____ years	
102	Sex of the selected person?	1 . M a l e 2. Female	
103	What is your current marital status?	1 . M a r r i e d 2. Single	

		3. Divorced 4. Widowed 5. separated	
1 0 4	What is educational status of the respondent	1. depoma 2. Bsc 3. MSC	
1 0 5	What monthly gross incomes do you earning?	1 . ----- b i r r	

Part 2: Personal and lifestyle factors

2.1. Next, I would like to ask you information about your personal and life style.

S n o	Q u e s t i o n / v a r i a b l e	A n s w e r	Skip
2 0 4	Do you have habit of doing physical exercise? (planned and scheduled physical exercise activities)	1 . Y e s 2. No →	206
2 0 5	If y e s f o r Q . 2 0 4 h o w o f t e n	1. one to Two times per week 2. ≥Three times per week	
2 0 6	What type of work do you mostly practice after leaving in this compound?	1 . N o t a t a l l 2. The same types of work 3. Others specify _____	
2 0 7	D o y o u c u r r e n t l y d r i n k a l c o h o l ?	1 . Y e s 2. No →	
2 0 8	If Quest. Number 207 is yes; how much do you drink alcohol per week?	----- d a y s .	

Part 3. Organizational and Occupational

The following few questions are focusing on your occupational factors. Please give your genuine response.

S n o	Q u e s t i o n / v a r i a b l e	A n s w e r	Skip
-------	-----------------------------------	-------------	------

3 0 2	How many hours do you mostly work per day?	----- Hours	
3 0 3	How many days do you mostly work per week (from Monday to Sunday	----- . Days	
3 0 4	What is your mostly total working breaks excluding lunch time per day	1 . N o n e 2. less than 15 minutes 3. above or Equal to 15 mi	

Part 4: Ergonomics factors associated. Please give your genuine response.

S. No	Q u e s t i o n s / v a r i a b l e s	A n s w e r	S k i p
5 0 1	Have you frequent Lifting high loaded object?	1 . Y e s 2. No	
5 0 2	Do you lift high loaded objects more than 20 kg on a daily basis?	1. Y e 2. 2. No	
5 0 3	Do you prolong standing in patient side?	1 . y e s 2 no	
5 0 4	Do you positioning patients on the bed?	1 . Y e s 2. No	
5 0 5	Have you got any training related to occupational Health and safety in the past 12 months?	1 . Y e s 2. No	

Part 5: Health History

The following few questions are focusing on your history of health. Few Questions may be that happened before some years back, please give your genuine response.

S n o	Q u e s t i o n / v a r i a b l e	A n s w e r	S k i p
6 0 1	Have you had lower back pain in the area between 12th ribcage and pelvic region during the past 12 month which lasts a day	1 ~~Y~~ → s 2 No	Q 6 0 2

6 0 2	If your answer for question no. 601 is yes, for how many days it lasts in total during the past 12 month this lower back pain?	_____ days	
6 0 3	How do you grade the level of your pain	1 . s e v e r 2. Medium 3. Low	
6 0 4	For how many days in total have you absent from work in the past 12 month due to low back pain?	_____ days	
6 0 5	Has the pain spread down your leg to blow your knee during past 12 month	1 Y e s 2 No	
6 0 6	How was the nature of lower back pain, when started you for the first time?	1 . G r a d u a l l y 2. Suddenly 3.suddenly outside c	
6 0 7	Have you remembered the immediate cause of lower back pain on first onset?	1 Y e s 2 No	
6 0 8	If the answer for Q.607 is yes, what was the main cause? (More than one option is possible)	1. l i f t i n g l o a d 2. twisting at work 3.Bent forward 4.carrying patient 5. Specify other. ____	
6 0 9	Which factors mainly increase the lower back pain in your activities? (More than one option is possible)	1 . W a l k i n g 2.prolonged standing 3. sitting 4. laying down back 5. side sleep 6. Specify others.	
6 1 0	Which factors mainly relieving back pain in your activities? (More than one option is possible)	1 . W a l k i n g 2. sitting 3. lay down backwa	

		4. side sleeping 5. specify others	
--	--	---------------------------------------	--

Thank you!

Declaration

I declare that this research Thesis entitled Magnitude and factors associated with lower back pain among intensive care unit nurses in Addis Ababa public hospitals, Ethiopia 2024 is my own work that have not been addressed in the study area as far as my knowledge touched and all the source I used has been indicated and acknowledged as complete references.

Name of investigator

signature

Date

Menilshewa Tesfaye (BSc, CCNP candidate)

Name of Advisors

2. Rahel Nega (Ass.professor, PhD fellow)

3. Seada Adem

Name of Invigilator

1. _____

2. _____
