ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

Assessment of self-reported work related low back pain and associated factors among nurses working in Intensive Care Unit (ICU) at Public and Private Hospitals, Addis Ababa, Ethiopia.

By: Wondwosen Yehualaw (BSc)

A thesis submitted to School of Graduate Studies of Addis Ababa University, College of Health Sciences, School of Public Health, in partial fulfillment of the requirements for the Degree of Master in Public Health (MPH)

April, 2017

Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY
SCHOOL OF PUBLIC HEALTH

MPH Thesis

Name of Principal Investigator	Wondwosen Yehualaw (BSc)
Name of Advisor	Samson Wakuma (MSc, MPH, PhD candidate)
Full title of the research project	Assessment of self-reported work related low back pain and associated factors among nurses working in Intensive Care Unit (ICU) at Public and Private Hospitals, Addis Ababa, Ethiopia.
Duration of project	March to April, 2017
Study Area	Addis Ababa, Ethiopia
Total Cost of the project	35,000 ETB
Address of investigator	School of Public Health, Addis Ababa University Phone no. +251945931099 Email; wondiyeyehualaw@gmail.com Addis Ababa, Ethiopia

Approved by examining board

_____	_____
Chairman of graduate committee	signature
_____	_____
Advisor	signature
_____	_____
Internal examiner	signature
_____	_____
External examiner	signature

Acknowledgement

Before all, I would like to thank God for all the things he has done for me. Then I would like to forward my heart full gratitude for my advisor Mr. Samson Wakuma for his helpful comments and guidance on the full process of this research project.

I also gratefully acknowledge Norwegian Program for Capacity Building in Higher Education and Research for Development (NORHED) for funding to the full implementation of this research project. I also would like to thank all Addis Ababa Public and private hospital administrators, and nurses participating in the study for their unlimited cooperation and providing information.

Finally my special appreciation goes to my dear friend Mr. Nigusie Fetene for his constructive comments on each stage of the work.

Contents

List of tables and figures

List of tables

List of figure

Abbreviations and Acronyms

AAHB	Addis Ababa Health Bureau
AAU	Addis Ababa University
BMI	Body Mass Index
FMHACA	Food, Medicine, and Health Administration and Control Authority
FMOH	Federal Ministry of Health
MSD	Musculoskeletal Disorder
ICU	Intensive Care Unit
LBP	Low Back Pain
OT	Operating Theatre
OPD	Out Patient Department
SPSS	Statistical Package for Social Sciences
SRS	Simple Random Sampling
USA	United States of America

Abstract

Introduction:

Low back pain (LBP) related to nursing profession, is a very common public health problem throughout the world. Nurses working in intensive care units are caring for people that are normally bedridden and helpless who require more assistance with transfers and handling. Therefore they have more ergonomic risks and experience low back pain more frequently. Little is known about the prevalence and associated factors of LBP among nurses working in ICU in our setup and there were no studies conducted on this subject in Ethiopia.

Objective: To assess the prevalence of self-reported work related low back pain and associated factors among nurses working in Intensive Care Unit (ICU) at Public and Private Hospitals of Addis Ababa, Ethiopia.

Methods: A cross-sectional study was conducted among 410 nurses working in ICU at all Public and Private Hospitals that have ICU in Addis Ababa, Ethiopia from March, 2017 to April, 2017. Data was collected by direct interview using a structured questionnaire adapted from Nordic Musculoskeletal Questionnaire. The questionnaire was translated in to Amharic and pre-tested before the actual data collection. The data was entered by using EPI-INFO version 7 and to analyze the data, Statistical Package for Social Sciences (SPSS) version 21 application was employed. The data was checked for accuracy before analysis. Bivariate logistic regression analysis and multivariate logistic regression analysis were used to assess the degree of association.

Results: From 448 study subjects the study included 410 nurses and gave a response rate of 91.5%. The mean age was 28.67 (±5.46) years. Majority of the respondents were females (306 (74.6%). And most of the participants (82.9%; (95% CI=78.6%-86.6%)) were complained Low Back Pain. There were statistical significant association between Low Back Pain with Sex, BMI, Years of experience in ICU, ICU work shift status, Regular Physical Exercise, Work environment, Assistance from co-workers, Working hours in a weak, and Inadequate rest interval.

Conclusion: A high prevalence of LBP was found among ICU Nurses working in Addis Ababa Public and private Hospitals. Work environment and personal factors were the major associated factors for LBP. Preventive measures should be taken like providing resting periods and having Regular Physical Exercise program, to reduce the risk of Low Back Pain among ICU Nurses.

1. Introduction

1.1. Background

Low Back Pain (LBP) is defined as pain or discomfort in the spinal area between the lower costal margins and gluteal folds with or without radiation to the leg below the knee for at least one day during the past 12 months [1]. Low back pain is an important public health problem prevalent all over the world. Low back pain affects 70-85% of the population and is a common cause of work related disability among workers. The annual prevalence of low back pain ranges from 15% to 45%. [2].

Low back pain is nearly a widespread experience among adult populations [3]. It is an extremely common health problem and well recognized cause of disability in the industrialized world[4]. It is estimated that about 80% of all populations will experience LBP at some period during their lifetime. The inter-cultural differences between nationalities in pain perception or pain reporting may be an explanation for the variation in prevalence rates among different countries. It was largely thought of as a problem confined to western countries, but at the moment, it has been demonstrated that LBP is also a major problem in low and middle income countries[5].

Low back pain (LBP) related to nursing profession, is a very common public health problem throughout the world. Nurses are required to lift and transport patients or equipment, often in difficult environment particularly in developing nations where lifting aids are not always available or practicable[3]. Because of exposure to work-related health hazards, nurses have been at a higher risk of back pain than other workers for several decades, [6].

Various risk factors have been implicated in the etiology and LBP is assumed to be of multi-factorial origin as individual, work-related, psychosocial and environmental factors can contribute to its development [7]. A history of back problems (a personal factor) and more frequent patient handling (an ergonomic factor) were the most common contributing variables to new episodes of low back problems [8].

Intensive care unit nurses have more ergonomic risks than nurses working in other units in hospitals [8]. The Intensive Care Unit (ICU) is a unit in the hospital where seriously ill patients are cared of by specially trained staff [9]

1.2. Statement of the Problem

Nursing interventions include physical, personal and ergonomic risk factors for low back pain. [10]. Due to the Low Back Pain caused by these risk factors, medical reports indicated that every year thousands of nurses in the world work with less efficiently and/or retire early. It is noted that in the United States of America (USA), back pain is the most common cause of activity limitation in people under the age of 45 years and is considered the second most frequent reason for visits to a physician. It is also ranked the fifth cause of admission to hospital and the third cause of surgical procedures. Two percent of the USA workforce is compensated for back injuries every year [2]. A recent American study announced that nurses are ranked the sixth highest with regard to lose their working days from job due to LBP [11].

Studies found that nurses who suffered from LBP had to receive medical treatment, some had to change workplace while others had contemplated to leave their nursing profession [12]. On another hand deterioration in nurses' health could also affect patient care delivery and subsequently patients' health. It has to believe that a numerous economic burden on individuals, families, communities and country in general. In the United States, it was reported that billions of dollars were spent annually on treatment of LBP [13]. There is still limited understanding on LBP among nurses in Ethiopia especially in relations to the risk factors and its prevalence.

Especially the nurses working in intensive care units experience low back pain more frequently due to reasons such as providing patient care by bending forward for long durations, over-forcing/over-loading some body parts while repositioning patients, and sparing more time for patient care. In addition, over-workload in intensive care units, and frequent repetition of body movements and functions such as reaching up-forward, holding, clasping-hugging, lifting and turning prepare the ground for the emergence of this problem [14]. Nurses with two or more years of ICU experience had a higher rate of receiving medical treatment than those with less than two years of experience. This finding may indicate that the more experience, the greater severity of back pain and the more actively nurses seek medical treatment [12]. Despite this fact, there is very limited number of studies on the assessment of low back pain among nurses who work in Intensive Care Unit. Little is known about the prevalence and associated factors of LBP among nurses working in ICU in our setup and studies conducted on this subject in our country

are almost none. Therefore the aim of this study is to assess the prevalence of self-reported work related low back pain and associated factors among nurses in Intensive Care Unit (ICU) at Public and Private Hospitals of Addis Ababa, Ethiopia.

1.3. Rationale and significance of the Study

There are little researches about LBP in the working population which are found in developing countries. Fewer epidemiological studies have examined the prevalence and associated risk factors of LBP among nurses working in ICU. To my knowledge there is no research that studied LBP prevalence among nurses working in ICU in Ethiopia. Thus this study will also be a bench mark and will be used as a base line data for other researches that are going to be done on work related low back pain among nurses working in ICU and among workers on other related jobs that could be the cause for lower back pain.

This study will also greatly contribute to the understanding of the magnitude and determinant factors of LBP among ICU nurses. As a result this study will have a great role for searching of possible alternatives and bring better solutions for the management of LBP among nurses working in ICU.

2. Literature review

2.1. Introduction about Low Back Pain (LBP)

Low Back Pain (LBP) is defined as pain or discomfort in the spinal area between the lower costal margins and gluteal folds with or without radiation to the leg below the knee for at least one day during the past 12 months [1]. Low back pain is nearly a widespread experience among adult populations [3]. It is an extremely common health problem and well recognized cause of disability in the industrialized world [4]. It is the leading cause of activity limitation and work absence. Not only to western countries, but at the moment, it has been demonstrated that LBP is also a major problem in low and middle income countries [5].

LBP is a common cause of morbidity in health care workers. Nursing is among the lists of highly risky profession for the occurrence of LBP [15]. Intensive care unit nurses have more ergonomic risks than nurses working in other units. The high back pain prevalence of ICU nurses could be caused by characteristics of ICU patients[4].

2.2. Prevalence of Low back pain among nurses

The low back pain point prevalence among employees in a district hospital in South Africa was found to be 47% and a higher percentage of nursing staff reported low back pain. Another study showed that the prevalence of low back pain among nurses is higher in a Nigerian hospital which was 74% [2]. In a study done by Naude' amongst 354 hospital employees in a level 1 hospital in South Africa, nursing staff were found to have a higher prevalence of low back pain (59%) as compared to other occupations that were part of the study population [16]. An analysis of prevalence of back pain among occupational groups in the Nigerian study revealed that the highest prevalence of back pain (69%) was recorded amongst nurses [17]. A high prevalence of chronic low back pain of 83% was also reported amongst nurses in rural Japan [18].

On the study held in Ethiopia the Point-Prevalence of LBP was 45.3% [7] which was in line with the findings of 43.5% among Nurses in Taiwan [19], 48.4% In Saudi Arabia [10] and 56.5% in Qatar [20]. And in the study it was found that the 12-month prevalence of LBP was 45.8% [7], which was lower than a study conducted in Egyptian Nurses by Amany which was 79.3% [21]. There is another study also which showed higher prevalence conducted in two selected hospitals in Nigeria and Ethiopia was 70% and 60% [22] respectively. Generally from the above studies it can be concluded that lower back pain prevalence among nurses is almost above 45% and even among more studies the prevalence is still much higher.

2.3. Prevalence of Low back pain among nurses working on ICU

A study held in South Korean hospitals found that ICU nurses one-year back pain prevalence is higher than a back pain prevalence of 40–60% among nurses in nursing units in other countries. It was found that 90.3% of ICU nurses had back pain at least once a month in the past 12 months. Out of these, 21.9% 'always' had back pain in the past year [23]. Another study in Turkish also confirmed that ICU nurses have more risks than nurses working in other hospital units [15]. In the recent study in Turkey, it was showed that ICU nurses have both a high degree of MSDs and high ergonomic risks. The frequency of experiencing an MSD symptom in the previous month was very high (95.9%). In addition, the ICU nurses' pain intensity score (mean) was 5.6 ± 2.2. This result was disappointing for a young study group, who were mostly aged between 21 and 35 [8]. In Canada, among the work-related back injury cases, ICU nurses accounted for 17% of all industrial accidents and had the highest rate along with orthopedic nurses [24].

2.4. Contributing factors for the occurrence of low back pain among nurses

The risk factors of LBP is assumed to be of multi-factorial origin, indicating that individual, physical and psychosocial factors can contribute to their occurrence and persistence of LBP on nursing populations [10]. Studies found that individual factors such as age, gender, educational level, body mass index, and, psychosocial factors, referring to job satisfaction, work stress, and anger have been examined and related to the occurrence of LBP [25].

According to another study, Reasons for this include both extrinsic and intrinsic risk factors that are relevant to nursing profession. Extrinsic factors include environmental and physical factors, whereas intrinsic factors provide for personal and ergonomic risk factors [26]. It was also stated that nursing interventions include physical, personal and ergonomic risk factors are the cause for low back pain [10].

There is also a study classified the risk factors into four categories: personal, occupational, environmental and psychosocial. All these factors have been found in the literature to be associated with low back pain amongst nurses [27]. According to the study; it is thought that the employees feel better and experience less anxiety as their satisfaction with the institution of employment increase, and that these factors have a positive effect on low back health [28].

Due to the low back pain caused by these risk factors, every year thousands of nurses in the world work with less efficiency receive medical reports and/or retire early. There is also a study which had shown that; age, gender, BMI, marital status, educational level, exercise program, smoking, alcohol, working departments and knowledge on back ergonomics were not significantly associated with LBP [7].

Studies give emphasis to Environmental and Occupational factors and stated that Environmental and Occupational factors are strongly associated with low back Pain. A strong association has been established between work related factors such as lifting, awkward, postures, bending, twisting, transfers and the development of low back pain [27]. It was also showed in another study that there was association between physical activities and LBP.

Based on different investigation studies explained that the relationship between physical activities and LBP as performing repetitive motions with hands or wrists, awkward posture, transferring and positioning patients, adjusting beds and bending or twisting the body were the major contributed factors [29]. This strengthened the idea that states that awkward posture during physical activities at work could also increase the risk of LBP among Nurses.

There is a significant association between knowledge of back care ergonomics and incident of LBP. According to the study held in Ethiopia, there was higher prevalence of LBP among Nurses who didn't have knowledge about back ergonomics (82.1%) than those who did have knowledge on back ergonomics [7]. Another studies also stated that nurses who had adequate knowledge regarding to back care ergonomics were less likely to prone to LBP. They reviled that adequate knowledge on back care ergonomics and ergonomics intervention programs can have good results in preventing LBP among Nurses[3].

Ergonomics of the environment, such as availability of working space, working in cramped positions and reaching or working away from the body predisposes nurses to the development of low back pain[30, 31]. According to the study held in Netherland it is reported that, in ICU nurses, low back complaints were associated with the ergonomics of the environment. Nurses working in surgery, orthopedics, obstetrics, gynecology, intensive care units and medical wards are more at risk of developing low back pain as compared to nurses in other wards [30, 31]. On the another hand it was also discussed that the organizational factors with regard to patient-nurse ratio, and the perception of nurse staffing influences nurses' health and patient safety [32]. The type of ward that people work in can contribute to high low back pain rates too. The association between night shift and low back pain has been established in some studies also.

Working at night leads to sleep deprivation and sleep disturbance which can result in muscle strain and usually fewer nurses at night and they are required to do heavy patient transfers with minimal assistance [30, 31].

Intensive care units (ICUs) are identified as having the highest occupational risk in terms of ergonomic risk [33]. Nurses in ICU are caring for people that are normally bedridden and helpless and require more assistance with transfers and handling [34]. This mean that especially the nurses working in intensive care units experience low back pain more frequently due to reasons such as providing patient care by bending forward for long durations, over-forcing/over-loading some body parts while repositioning patients, and sparing more time for patient care [14].

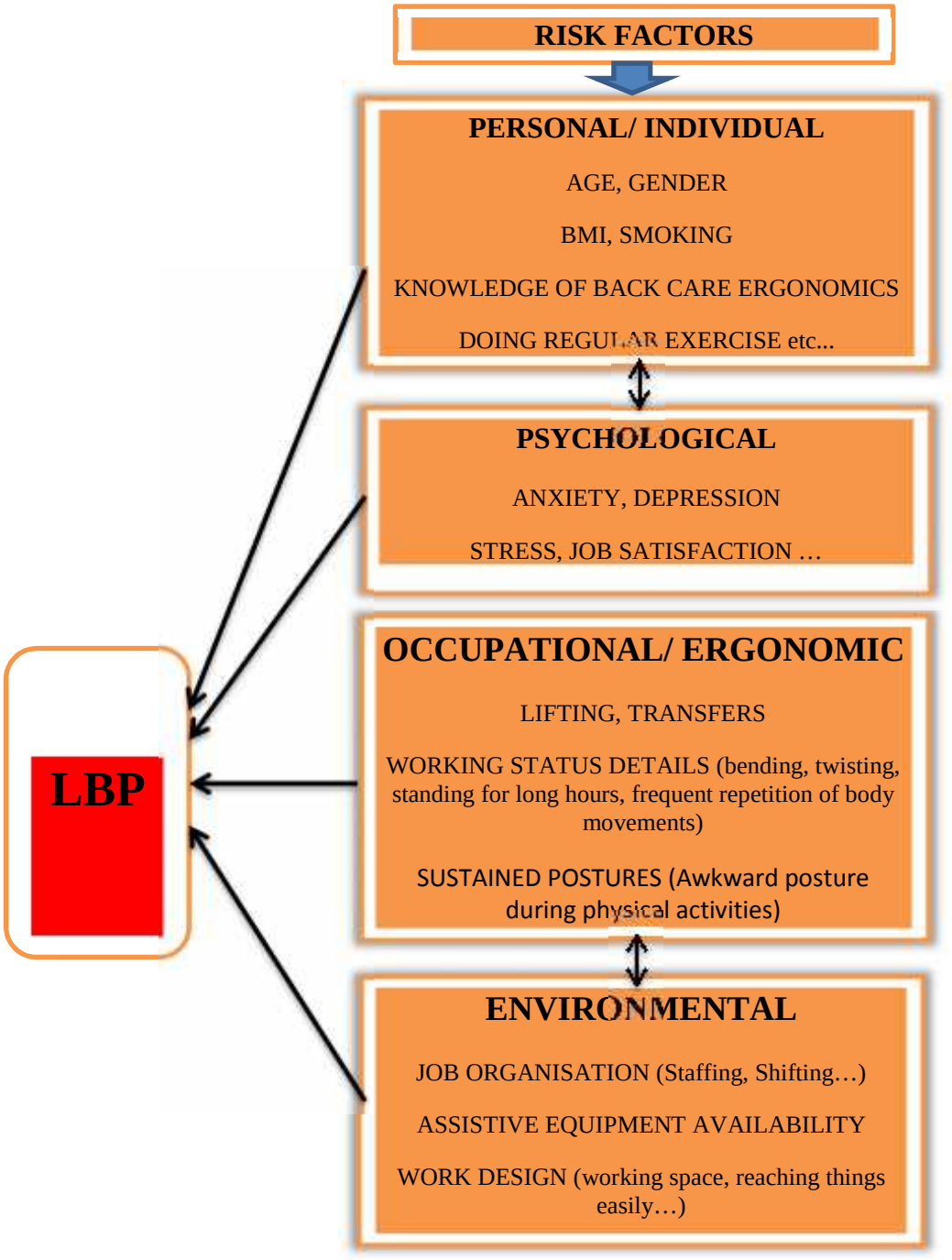
In addition, over-workload in intensive care units, and frequent repetition of body movements and functions such as reaching up-forward, holding, clasping-hugging, lifting and turning contribute for the emergence of this problem [14].Other Studies strengthened that MSD development in ICU nurses is caused by physical and psychosocial factors, such as standing for long hours, daily workload, dissatisfaction with work, caring for patients with co-morbidities, frequently encountered deaths, interaction with families of patients and inadequate income [33, 34]. Generally, most studies agreed that ICU nurses have more risks than nurses working in other

hospital units [14]. Unfortunately there is very limited number of studies on the assessment of low back pain in nurses who work in intensive care units especially very rare in Africa.

3. Conceptual framework

A study used a comprehensive conceptual framework adapted from study determinants. The conceptual framework clearly indicates explicit connections among relevant contextual factors of LBP. The arrows in the diagram show the interactions between the variables. As depicted below low back pain (LBP) may be caused by different risk factors, which are personal/ individual, occupational/ ergonomic, psychological and environmental factors to mention. The diagram also tried to show the possible interventions that may apply to the risk factors to decrease lower back pain. The details of the framework displayed below.

Figure 1: Conceptual framework[27]



4. Objectives

4.1. General Objectives

- To assess the prevalence of self-reported work related low back pain and associated risk factors among nurses working in Intensive Care Unit (ICU) at Public and Private Hospitals of Addis Ababa, Ethiopia.

4.2. Specific Objectives

- To estimate the prevalence of self-reported work related low back pain.
- To identify factors associated with self-reported work related low back pain.

5. Methods

5.1. Research Design

An Institution-based cross-sectional study was employed to assess the prevalence of Low Back pain (LBP) and to identify factors that contribute to LBP among nurses who have been working on ICU at public and Private Hospitals of Addis Ababa, Ethiopia.

5.2. Study area and period

The study was conducted in Addis Ababa the capital city of Ethiopia and headquarters of African Union (AU). Administratively Addis Ababa divided in to ten sub cities. There are a total of 10 Public Hospitals and 37 registered private hospitals in the city which are controlled by Federal Ministry of Health (FMOH), Addis Ababa City Health Bureau (AAHB) and Addis Ababa FMHACA. In the public hospitals there are 2,301 nurses who are responsible for patient care. Out of these, 318 nurses have been working in ICU. Whereas there are a total of 603 nurses in the private hospitals that have ICU in which 168 nurses are those who have been working in ICU. These hospitals have isolated ICU departments where severely ill patients are cared of.

The services provided included general surgery, obstetrics and gynecology, medicine, orthopedics, anesthesia, pediatrics and neurosurgery. The study was conducted among permanently employed nurses working in ICU at Public Hospitals and selected Private Hospitals, Addis Ababa, Ethiopia from March, 2017 to April, 2017.

5.3. Source population

The source population was all employed nurses who have been working in ICU at Public and Private Hospitals, Addis Ababa, Ethiopia.

5.4. Study population

The study population was all selected nurses who are working in ICU at Public and Private Hospitals, Addis Ababa, Ethiopia.

5.5. Inclusion and Exclusion criteria

Inclusions criteria: All nurses who have been working in ICU, and permanently employed (have more than 6 months experience) at Addis Ababa public and Private Hospitals of Addis Ababa.

Exclusion criteria: Nurses who were pregnant, those who went for education programs, and nurses on annual leave were excluded.

5.6. Sample size determination

The sample size is determined using the following formula**;**

$$n= \frac{(z^{\alpha}/_{2})^{2}}{d^{2}} pq$$

Where:

n = sample size

- P= lower back pain prevalence 84.2 **%[28].** On another hand a study on ICU nurses in Gaziantep, Turkey but different socio economic status which is sometimes difficult to compare.

q = 1-p =0.158

d = desired degree of precision =0.05

Z= is the standard normal value at the level of confidence desired, usually at 95% confidence level which is 1.96

Therefore: $\frac{(1.96)^2}{0.05^2} 0.842 * 0.158$

n=204

Finally considering 10% non-response rate the total sample size was 224

n=224

- The proportion of lower back pain prevalence was found to be 45.8% on the study held in Ethiopia [7] which have the same socio-economic status but which was not in ICU since there is no research among Nurses working in ICU in Ethiopia.

P=0.458

q = 1-p =0.542

d = desired degree of precision =0.05

Z= is the standard normal value at the level of confidence desired, usually at 95% confidence level which is 1.96

Therefore: $\frac{(1.96)^2}{0.05^2} 0.458 * 0.542$

n=381

Finally considering 10% non-response rate the total sample size was 419

n=419

Therefore the proportion which makes the sample size comparably greater (the prevalence 45.8%) was taken. So the prevalence of the study held in Ethiopia was selected even though it is not on ICU.

Field visit (direct on site census) at public and private hospitals of Addis Ababa indicated the presence of 486 nurses working in ICU unit; 318 from Public and 168 from Private Hospital. Based on the information obtained from each Hospitals ICU departments, human resource departments and Hospital administrators 29 nurses from public Hospitals and 9 nurses from private Hospitals didn't fit the inclusion criteria. That means available nurses for selection was 448. All 448 study subjects were included in the study to maximize the precision or accuracy. It was also noted that data quality, feasibility and use of resources was not compromised since it was not very large sample and has not much difference with the calculated sample result, (419).

Therefore; sample size= the actual size of the study subjects (289 from Public Hospitals +159 from Private Hospitals) =448

5.7. Sampling technique

There are different numbers of nurses working in ICU in each Hospital. There were 10 Public and 20 Private Hospitals that had ICU departments which were a total of 30 hospitals which had Intensive Care services. Since all nurses working in ICU were taken as the study subjects, the actual size of nurses working in ICU from each hospital was taken accordingly.

Table 1: The distribution of Nurses working in ICU at each Public Hospitals of Addis Ababa, Ethiopia, 2016.

Hospital	Kidus paulos Abet including hospital	Black Lion (Tikur Anibesa) hospital	Tirunesh Beijing General Hospital	Yekatit hospital	Zewditu hospital	Ras desta hospital	Dagmawi Minilik hospital	ALERT	Gandhi memorial Hospital	Petrous hospital	**total**
Number of nurses working in ICU	73	70	12	32	29	16	13	13	16	15	**289**

Table 2: The distributions of nurses at Private Hospitals of Addis Ababa, Ethiopia, 2016.

No	Private Hospitals that have ICU in Addis Ababa	
	Hospitals	**Number of nurses working in ICU**
1	Teklehayemanot Hospital	18
2	Addis MCH Hospital	5
3	Tezena general Hospital	4
4	Betel teaching general Hospital. No1.	13
5	Betel teaching general Hospital. No2.	10
6	Addis General Hospital	03
7	Amin Hospital	3
8	Addis Cardiac Hospital	5
9	Hayat Hospital	7
10	Girum Hospital	20
11	Kadisko Hospital	07
12	Kidus Yared Hospital	09
13	ICMC general Hospital	07
14	Bethezata Hospital	6
15	Landmark Hospital	3
16	Haleluya General Hospital	10
17	National Hospital	2
18	Addis Hiwot	5
19	Yerer Hospital	9
20	Koriea Hospital	13
	Total	**159**

5.8. Study variables

5.8.1. Dependent variables

LBP among nurses worked in ICU.

5.8.2. Independent variables

Socio- demographic variables: age, sex, BMI, educational level, income, marital status

Personal factors: smoking habit, knowledge of back care ergonomics, training, alcohol drinking status, past medical history of low back pain, Leisure time (recreation activity), physical activities/exercises.

Occupational and Ergonomic factors: lifting, transfers, working status (bending, twisting, standing for long hours, frequent repetition of body movements), sustained postures (awkward posture during activities)

Psychological factors: anxiety**,** stress**,** job satisfaction

Environmental factors: job organization (staffing, shifting), assistive equipment availability, work design (working space, reaching things easily).

5.9. Data Collection Techniques

Face to face interview was held to each respondent. Data was collected using a standard questionnaire adapted from Standard Nordic Questionnaire, [27, 35]. The questionnaire included socio-demographic characteristics, personal habits and individual factors, back pain features, contributory factors and consequences of LBP. First, the English version of the questionnaire was prepared. Then it was translated to Amharic version (local language) to make suitable conversation during an interview and re translated to English to check if it is consistent with the original questionnaire.

Four Environmental Health professionals, one Public Health Officer, and one Nurse; a total of six data collectors who had BSc degree were responsible to interview the respondents. Whereas

one supervisor who had BSc Degree in Environmental Health was also coordinating and managing the data collection process and transferred all the documents and necessary information to the principal investigator.

5.10. Data management

All data collectors were oriented and trained on how to handle the recorded data. The supervisor were controlling and managing the proper allocation and handling of data. All questionnaires were locked up in a cupboard for security and safety and all the necessary materials and equipment's were kept safely.

5.11. Data quality assurance

The Standard Nordic Questionnaire was used to assure the quality. Further a pretest study was carried out among nurses working in ICU at Hospitals in the city surrounding Addis Ababa to validate the questionnaire. During the pretest, the researcher randomly selected a pretest group of 5% respondents which gave a total of 21 respondents. The questionnaire was also given to the advisors to critique it and for final approval. Data collectors were trained before data collection in order to fill the questioner properly and to minimize bias. Each data collector was checking the questionnaires for completeness before leaving each study participant. Data completeness accuracy and clarity were checked daily by the supervisor. The overall works were managed and supported by the principal investigator. Finally the data was entered by using EPI-INFO version7 software.

5.12. Data Analysis

The data was entered by using EPI-INFO version 7 and exported to SPSS version 21.0 for cleaning and analysis. Data cleaning was done by running each frequency and cross-check it with the hard copies.

For the first objective that was determination of the prevalence of low back pain, frequency distribution in number and percentage was used to describe the data. Socio demographic, Personal factors, Occupational and Ergonomic factors, Environmental factors, and Psychological factors were also described using the data frequency distribution in number and percentage by narration and tables.

Bivariate logistic regression analysis was used to assess the presence of association between the associated factors and the outcome variable (LBP). Variables were entered into multivariate logistic regression to control the effects of potential confounding factors and to identify risk factors of LBP. Those variables that entered into multivariate logistic regression were those that showed p-value <0.3 to avoid an excessive numbers of variables and unstable estimates in the multivariate analysis. Presence and level of significant association was determined using odd ratio with 95% CI and p-value of 0.05.

5.13. Operational Definition of terms

- Low Back Pain (LBP):- pain or discomfort felt in the lower back with or without radiation to the leg below the knee. [1]
- Work related lower back pain: Low Back Pain related to nursing practice.
- Current low back pain: - pain that respondents had at the time the study was conducted, lasting for 3 months.
- 12-month low back pain: - refers to pain lasting for 12 months in an area between the twelfth ribs and the gluteal folds and for the purpose of this study is called chronic low back pain.
- Sever pain: pain with most of work related activities and when the pain is occurring regularly also when the threshold of pain is high.
- Moderate pain**:** pain with some of work related activities with arbitrarily occurring and when the threshold of pain is medium.
- Mild pain**:** feeling pain rarely and the level of pain is not noticeable.
- Intensive Care Unit (ICU):- is a specially staffed and equipped, separate and self-contained area of a hospital dedicated to the management of patients with life-threatening illnesses, injuries and complications, and monitoring of potentially life-threatening conditions
- BMI: The body mass divided by the square of the body height, and is expressed in units of kg/m^2.
    - ✓ A BMI below 18.5 is considered underweight.
    - ✓ A BMI of 18.5 to 24.9 is normal

- ✓ 25-29.9 is considered as overweight.
- ✓ 30 or higher is fall under the category of obese.

- Cigarette smoking: -An adult who has smoked 100 cigarettes in his or her lifetime and who currently smokes cigarettes.
- Alcohol drinking: Drinking 5 or more alcoholic drinks on the same occasion on each of 5 or more days in the past 30 days.
- Regular physical exercise: physical activity that is planned, structured, and repetitive for the purpose of conditioning the body
- Fatigue: A physiological state of reduced mental or physical performance capability resulting from sleep loss, or workload.
- Sustained posture: a posture held for a long time while working.
- Awkward position: any position which makes part of the body bends or twists away from a comfortable position.
- Public hospital: Hospitals that serves the community which are administered by the government. It doesn't include those hospitals that are controlled by the government but serving only special governmental offices (Armed forces and Police hospitals).
- Private hospital**:** Hospitals that serves the community but belonging to an individual person or a specific group.
- Job satisfaction: - It was a subjective response of study participants about their job whether it is pleasurable and being satisfied or not.

5.14. Ethical Considerations

The ethical approval and clearance was obtained from Addis Ababa University, School of Public Health ethical committee. Permission was also secured from those Public and Private Hospitals located in Addis Ababa.

Privacy issue was critically maintained. Informed consent was obtained from each participant and the information obtained from them would not have been disclosed to third person/body. Confidentiality was assured. More of participation in this study was entirely voluntary.

6. Result

6.1. Socio-demographic characteristics

Out of 448, a total of 410 respondents were participated in this study with the response rate of 91.5%. Among the study participants, the majority of respondents 264(64.4%) were from Public Hospitals and 146(35.6%) were from Private Hospitals.

The mean age of the respondents was 28.67 (±5.46) years with minimum age of 22 and a maximum of 62. Majority of the study participants 287 (70%) were in the age group of 20-29 years. Concerning sex 306 (74.6%) of the participants were females. When participants measured according to their BMI level majorities 313 (76.4%) were in the healthy or normal (18.5-24.9) level, while 51(12.4%) were under-weight (≤18.5) and 4(1%) were obese (≥30).

Majority of the participants 236 (57.6%) were single while 166(40.5%) were married and the rest were divorced. It was also observed that majority of the participants 284(69.2%) were first degree holders by their educational status. Regarding monthly income of the participants, the median monthly income was 4444 with the range of 1100-9028 (see Table 3).

Table 3: - Socio-demographic Characteristics of Nurses who has been working in ICU at Hospitals of Addis Ababa, Ethiopia, 2017.

Variables		Frequency	Percent (%)
Hospitals	Public	264	64.4
	Private	146	35.6
Age	20-29	287	70.0
	30-39	105	25.6
	≥40	18	4.4
Sex	Female	306	74.6
	Male	104	25.4
BMI	≤18.5	51	12.4
	18.5-24.9	313	76.4
	25-29.9	42	10.2
	≥30	4	1.0
Marital Status	Married	166	40.5
	Single	236	57.6
	Divorced	8	2.0
Educational status	Diploma	122	29.8
	Degree	284	69.2
	Masters/PhD	4	1.0
Average monthly income	<2500	41	10.0
	2500-5000	244	59.5
	>5000	125	30.5

6.2. Personal factors of nurses working in ICU

Majority of the participants 255(62.2%) had <5years nursing experience and still the majorities 249(66.7%) had work experience of <2years in ICU. Only 34(8.3%) of participants had an experience of >10years with nursing and 83(20.2%) participants had 4years and above experience in Intensive Care Unit (ICU). More than half of the participants 285(69.5%) were permanently working in ICU. From shift workers 125(30.5%), majorities 79(19.3%) replied as they were shifted to other units and wards yearly. The study also showed that 274(66.8%) of the participants were working in Adult ICU and the rest of participants 136(33.2%) worked in Neonatal ICU. From those nurses working in Adult ICU, almost all nurses worked in a mixed room 247(60.2%) where all ICU specialties and services were given in one room.

Majority of the respondents 251(61.2%) had taken special training on Intensive Care and more than half of the respondents 218(53.2%) had knowledge on back ergonomics. According to the study, 245(54.9%) of the participants were never go to an exercise program. Most of the participants 383 (93.4%) have never smoked cigarette and the majority of participants 338 (82.4%) also have never drink alcohol (Table 4).

Table 4: -Personal factors of Nurses working in ICU at Hospitals of Addis Ababa, Ethiopia, 2017.

Variables		Frequency	Percent (%)
Total years in nursing	<5	255	62.2
	5-10	121	29.5
	>10	34	8.3
Total years in ICU	<2	249	60.7
	2-4	78	19
	>4	83	20.2
ICU work status	Permanently	285	69.5
	Shift worker	125	30.5
Work shift status	Every 3 month	8	2
	Every 6 month	14	3.4
	Yearly	79	19.3
	Two year and above	24	5.9
ICU specialty	Neonatology	135	32.9
	Pediatrics	5	1.2
	Specialty medicine	13	3.2
	Specialty surgery	10	2.4
	Mixed	247	60.2
ICU working division	Neonatal ICU	136	33.2
	Adult ICU	274	66.8
Special training on Intensive care	Yes	251	61.2
	No	159	38.8
Knowledge on back ergonomics	Yes	218	53.2
	No	192	46.8
Physical Exercise program/week	Never exercise	225	54.9
	Sometimes(1-3 days/ weak)	158	38.5
	Usually(>4days/ weak)	27	6.6
Smoking status	Yes	27	6.6
	No	383	93.4
Drinking status	Yes	72	17.6
	No	338	82.4

6.3. Low Back Pain (LBP) status of nurses and Consequences in ICU

Among 410 respondents, 340(82.9%) of them was experienced low back pain during the last 12 months (95% CI: 78.6%-86.6%); whereas, the prevalence of Low Back Pain during the last seven days was 222(54.1%). Only 46(11.2%) participants had past history of low back pain (before working as a nurse).

This study showed that 68(20%) of the participants had severe pain on their low back and about nearly half of the participants147 (43.24%) felt moderate pain during the past 12 months. Among 340(82.9%) nurses who reported history of LBP, 25(7.4%) and 120(35.3%) nurses reported daily and frequent pain respectively while the others experienced infrequent pain. Out of those participants, 96(28.24%) of them were hospitalized due to low back pain. Two hundred nine (61.47%) respondents were replied as their daily living and leisure activities were affected because of the pain on their Lower Back. Furthermore the same magnitude 209(61.47%) of participants complained their pain was radiated to their lower extremities and other body parts.

Regarding absenteeism from work, above one-fourth of the study participants 95(27.94%) was absent due to low back pain. Two hundred ninety four (86.47%) participants claimed that working in ICU is the main cause and aggravating factor for the Pain on their Lower Back. From those workers with LBP and who worked night, 308(75.12%), most half of the participants 193(62.66%) complained night shift for the occurring and aggravating of their low back pain (Table 5).

Table 5: - Low Back Pain (LBP) status of Nurses working in ICU at Hospitals of Addis Ababa, Ethiopia, 2017.

Variables		Frequency	Percent (%)
Past history of low back pain (before working as a nurse).	Yes	46	11.2%
	No	364	88.78%
Low back pain in the last 12. Months	Yes	340	82.9
	No	70	17.1
Severity of Low Back pain (n=340).	Mild	125	36.76
	Moderate	147	43.24
	Severe	68	20.0
Hospitalization due to Low back pain (n=340).	Yes	96	28.24
	No	244	71.76
Thought to change work due to Low back pain(n=340)	Yes	147	43.24
	No	193	56.76
Duration of Low back pain (n=340)	Infrequent (<3 days/ weak)	195	57.35
	Frequent(3-5 days/ weak)	120	35.29
	Daily pain (6-7 days/ weak)	25	7.35
Pain radiate to other body part (n=340)	Yes	209	61.47
	No	131	38.53
Low back pain in the last 7 days	Yes	222	54.14
	No	188	45.86
Daily living and leisure activities affected due to Low Back Pain (n=340)	Yes	209	61.47
	No	131	38.53
Absent from work due to low back pain (n=340).	Yes	93	27.35
	No	247	72.65
Nursing as the cause or aggravating factor for LBP (n=340)	Yes	274	80.59
	No	66	19.41
Working in ICU the cause or aggravating factor for LBP (n=340)	Yes	294	86.47
	No	46	13.53
Night shift has greater pain on Low Back(n=308)	Yes	193	62.66
	No	115	37.34

6.4. Work-Related and Ergonomic Risk Factors for Low Back Pain

About 340(82.9%) of the respondents were experienced with LBP; of which most of the respondents believed that standing for a prolonged period of time 318 (93.53%) was the major factor which contributed to their LBP occurrence. Whereas, more than half of the respondents believed that positioning of patients on bed 207 (60.88%), was one cause and aggravating factor for their low back pain.

One hundred sixty nine (49.71%) participants believed that their Low Back Pain is because of; transferring a patient. Other participants complained bending or twisting163 (47.94%), bent over for a prolonged period of time140 (34.1%), Pushing or pulling 140(41.18%), and working when physically fatigued 129 (37.94%) for the pain on their lower back.

Even if with the small proportions, according to the respondents, working in an awkward or cramped position 101(29.71%), performing repetitive tasks 74(21.76%), giving medication 35(10.29%), kneeling for a prolonged period of time 28(8.24%), and sitting for a prolonged period of time 22(6.47%) also have contributions for their low back occurrence (Table 7).

Table 6: - Work-related Ergonomic risk factors and work environment factors of Low Back Pain among nurses who have been working in ICU at Hospitals of Addis Ababa, Ethiopia, 2017.

Variables		Frequency	Percent (%)
Work related ergonomic factors in ICU which was the cause for and aggravated Low Back Pain among those that had LBP (n=340)	Giving Medication	35	10.29
	Bending or Twisting	163	47.94
	Lifting	143	42.06
	Positioning of patients on bed	207	60.88
	Maintaining a position for a prolonged period of time	318	93.53
	standing for a prolonged period of time	318	93.53
	sitting for a prolonged period of time	22	6.47
	kneeling for a prolonged period of time	28	8.24
	bent over for a prolonged period of time	140	41.18
	Performing repetitive tasks	74	21.76
	Transferring a patient	169	49.71
	Working in an awkward or cramped position	101	29.71
	Working when physically fatigued	129	37.94
	Pushing or pulling	140	41.18
work condition status (n=340)	Day	32	9.41
	Night	5	1.47
	Sometimes Day sometimes night on shift	248	72.94
	Permanently on day/night duty	55	16.18
More pain on night shift(n=308)	Yes	193	62.66
	No	115	37.34
inadequate rest interval	Yes	275	67.1
	No	135	32.9
shortage of staffs	Yes	232	56.6
	No	178	43.4

6.5. Psychological Factors of Low Back Pain

Even if majority of the respondents 266(64.9%) were satisfied for being a nurse but above three fourth of the respondents 307(74.9%) were not satisfied with the income they got and most of them 353(86.1%) also dissatisfied of fatigue because of daily workload. Majorities also reported sleep disturbance 256(62.4%) in their working environment and above one third of the respondents 154 (37.6%) were feeling little pleasure because of working on ICU.

One hundred thirty nine (33.9%) participants were uncomfortable with their daily nursing activities in the ICU and 114 (27.8%) reported that they were mental stressed at their working environment (Table 7).

Table 7: - Psychological Factors of Low Back Pain among nurses who have been working in ICU at Hospitals of Addis Ababa, Ethiopia, 2017.

Variables		Frequency	Percent (%)
Satisfied being a nurse	Yes	266	64.9
	No	144	35.1
Comfortable with your daily nursing activities in the ICU	Yes	271	66.1
	No	139	33.9
Stress	Yes	114	27.8
	No	296	72.2
Sleep disturbance	Yes	256	62.4
	No	154	37.6
Little pleasure	Yes	154	37.6
	No	256	62.4
Fatigue because of daily workload	Yes	353	86.1
	No	57	13.9
income satisfaction	Yes	103	25.1
	No	307	74.9
Generally How much you are satisfied with your work?	Very dissatisfied	52	12.7
	Dissatisfied	90	22
	Neutral	142	34.6
	Satisfied	92	22.4
	Very satisfied	34	8.3

6.6. Association status of Factors with Low Back Pain among Nurses working in ICU

6.6.1. Bivariate analysis; Factors with Low Back Pain among Nurses working in ICU.

According to the bivariate analysis the socio-demographic variables i.e. sex, educational status and monthly income were significantly associated with LBP. Personal factors of the respondents' such as years of experience in ICU, ICU Work status, ICU specialty work division, and regular exercise program were significantly associated with the LBP.

Females were more likely to have LBP compared to males: (COR=2.32; 95%CI=1.35-3.98). Diploma nurses had the higher rates of LBP experience, (COR=1.91; 95%CI=1.02-3.59). Nurses who earned <2500birr and 2500-5000birr monthly income were 3.6 and 2.7 times more likely to have low back pain than those who got >5000birr: (COR=3.6; 95%CI=1.19-10.84) and (COR=2.67; 95%CI=1.55-4.6) respectively. With regard to years of experience in ICU, those nurses who worked more than 4years in ICU were more exposed to the risk of LBP than those that had less than two years' experience in ICU: (COR=3.18; 95%CI=1.31-7.73). Neonatal ICU nurses were also more likely to have LBP than nurses worked in Adult ICU: (COR= 2.49; 95%CI=1.31-4.72). Moreover nurses who had regular physical exercise program were less likely exposed to low back pain: 1-3 days/week, (COR=0.34; 95%CI=0.19-0.59), and greater than 4 days/week: (COR=0.36; 95%CI=0.13-0.99) respectively.

From work-related ergonomic risk factors, work environment risk factors and psychosocial risk factors, those that had significant association with outcome variable were; work environment status, assistance from co-workers, working hours in a week, inadequate rest interval, and shortage of staffs.

6.6.2 Multivariate logistic regression analysis

In multivariate logistic regression analysis that showed significant association from socio demographic variables were sex (females): (AOR=1.96; 95%CI=1.00-4.07), BMI (18.5-24.9): (AOR=3.68; 95%CI=1.37-9.88) and BMI (>25 years): (AOR=6.11; 95%CI=1.40-26.75). From this result it can be seen that females were almost 2 times more likely exposed to LBP.

From personal factors, ICU specialty work division that was associated at bivariate analysis did not show any significant associations here; but the others, years of experience in ICU(>4 years): (AOR=11.20; 95%CI=3.22-38.94), ICU work status who were shift workers: (AOR=2.65; 95%CI=1.17-6.02), and regular physical exercise program(1-3 days/week), (AOR=0.28; 95%CI=0.14-0.56) and physical exercise program(>4 days/week): (AOR=0.23; 95%CI=0.06-0.86) were remained significant in multivariate logistic regression analysis. Therefore it was clearly seen that those nurses working in ICU more than four years were eleven times more likely exposed to LBP. And the study also showed that nurses who had the habit of doing regular physical exercise were less likely to have LBP.

From work-related ergonomic risk factors, work environment risk factors and psychosocial risk factors, shortage of staffs and dissatisfied of fatigue because of the workload didn't show any significant association. On another hand; work environment status (comfortable, well), not getting assistance from co-workers, >40working hours in a week, and inadequate rest interval showed significant association with the outcome variable.

Nurses who were in a comfortable working environment were less likely to have low back pain: (AOR=0.13; 95%CI=0.03-0.54). When the working environment is in a well condition also nurses were less likely exposed to LBP: (AOR=0.21; 95%CI=0.07-0.69) than those nurses who were in a bad/crowded environment. Concerning of getting assistance from co-workers, those nurses that didn't get co-workers assistance were more likely to have LBP than nurses who got assistance from co-workers: (AOR=1.98; 95%CI=1.00-4.39).With regard to working hours in a week, nurses that worked more than forty (40) hours per week were 5 times more likely exposed to LBP: (AOR=5.10; 95%CI=2.10-12.40) than those who had been working less than forty hours. Similarly nurses with inadequate rest interval were almost 2 times more likely exposed: (AOR=1.94; 95%CI=1.01-4.02) to LBP (Table 9).

Table 8: -Association between factors with low back pain among nurses, working in ICU at Hospitals of Addis Ababa, Ethiopia, 2017.

Variables		Low back pain		Crude OR (95% CI)	Adjusted OR (95% CI)	P value
		Yes	No			
Sex	Female	264(77.6%)	42(60%)	**2.32(1.35-3.98) ***	**1.96(1.00-4.071) ***	**0.05**
	Male	76(22.4%	28(40%)	1		
Age	20-29	242(71.2%)	45(64.3%)	1		
	30-39	82(24.1%)	23(32.9%)	0.66(0.38-1.16)	0.93(0.34-2.49)	0.88
	>40	16(4.7%)	2(2.9%)	1.49(0.33-6.69)	1.85(0.16-21.61)	0.63
BMI	<18.5	39(11.5%)	12(17.1%)	1		
	18.5-24.9	260(76.5%)	53(75.7%)	1.509(0.74-3.67)	**3.68(1.37-9.88) ***	**0.01**
	>25	41(12.1%)	5(7.1%)	2.52(0.81-7.82)	**6.11(1.396-26.75) ***	**0.02**
Marital Status	Married	139(40.9%)	27(38.6%)	0.735(0.09-6.25)		
	Single	194(57.1%)	42(60.0%)	0.66(0.08-5.51)		
	Divorced	7(2.1%)	1(1.4%)	1		
Educational status	Diploma	108(31.8%)	14(20%)	**1.913(1.02-3.59) ***	1.54(0.65-3.66)	0.33
	Degree and above	232(68.2%)	56(80%)	1		
Monthly income(birr)	<2500	37(10.9%)	4(5.7%)	**3.6(1.19-10.84) ***	3.55(0.74-16.94)	0.11
	2500-5000	213(62.6%)	31(44.3%)	**2.67(1.55-4.6) *****	2.33(0.98-5.50)	0.054
	>5000	90(26.5%)	35(50%)	1		
Years of experience in Nursing	<5 years	217(63.8%)	38(54.3%)	1		
	5-10 years	94(27.6%)	27(38.6%)	0.61(0.35-1.06)	0.56(0.22-1.39)	0.21
	>10 years	29(8.5%)	5(7.1%)	1.02(0.37-2.79)	0.51(0.07-3.49)	0.49
Years of experience in ICU	<2 years	202(59.4%)	47(67.1%)	1		
	2-4 years	56(16.5%)	17(24.3%)	0.77(0.41-1.44)	1.14(0.49-2.66)	0.76
	>4 years	82(24.1%)	6(8.6%)	**3.18(1.31-7.73) ****	**11.2(3.22-38.94) *****	**0.000**
ICU Work status	Permanently	229(67.4%)	56(80%)	1		
	Shift worker	111(32.6%)	14(20%)	**1.94(1.04-3.63) ***	**2.65(1.17-6.02) ***	**0.02**
ICU specialty Work division	Adult ICU	217(63.8%)	57(81.4%)	1		
	Neonatal ICU	123(36.2%)	13(18.6%)	**2.49(1.31-4.72) ****	0.85(0.36-2.02)	0.71
Training on back ergonomics	Yes	205(60.3%)	46(65.7%)	1		
	No	135(39.7%)	24(34.3%)	1.26(0.74-2.16)		
Knowledge on Back Ergonomics	Yes	177(52.1%)	41(58.6%)	1		
	No	163(47.9%)	29(41.4%)	1.30(0.77-2.19)		
Regular Exercise program	Never Exercise	201(59.1%)	23(32.9%)	1		
	Sometimes	120(35.3%)	41(58.6%)	**0.34(0.19-0.59) *****	**0.28(0.14-0.56) *****	**0.000**
	Usually	19(5.6%)	6(8.6%)	**0.36(0.13-0.99) ***	**0.23(0.06-0.86) ***	**0.03**

Variables	Low back pain		Crude OR (95% CI)	Adjusted OR (95% CI)	P value
	Yes	No			
Work environment					
Comfortable	43(12.6%)	12(17.1%)	**0.23(0.08-0.7) ****	**0.13(0.03-0.54) ****	**0.005**
Well	219(64.4%)	53(75.7%))	**0.27(0.10-0.69) ****	**0.21(0.07-0.69) ***	**0.01**
Bad/ crowded	78(22.9%)	5(7.1%)	1	1	
Assistance from co-workers					
Yes	221(65.0%)	56(80%)	**1**	1	
No	119(35.0%)	14(20%)	**2.15(1.15-4.03) ***	**1.98(1.00-4.39) ***	**0.05**
Using Assistive devices					
Yes	208(61.2%)	42(60%)	1		
No	132(38.8%)	28(40%)	0.95(0.56-1.61)		
Working hours in a week					
≤40	29(8.5%)	17(24.3%)	1	1	
>40	311(91.5%)	53(75.7%)	**3.44(1.77-6.7) *****	**5.10(2.10-12.4) *****	**0.000**
Adequate rest interval					
Yes	96(28.2%)	39(55.7%)	1	1	
No	244(71.8%)	31(44.3%)	**3.2(1.89-5.42) *****	**1.94(1.01-4.02) ***	**0.047**
Shortage of staffs					
Yes	202(59.4%)	30(42.9%)	**1.95(1.16-3.28) ****	1.81(0.88-3.69)	0.11
No	138(40.6%)	40(57.1%)	1	1	
Fatigue because of workload					
Yes	301(88.5%)	52(74.3%)	**2.67(1.42-5.02) ****	1.94(0.83-4.55)	0.13
No	39(11.5%)	18(25.7%)	1	1	
Income Satisfaction					
Yes	79(23.2%)	24(34.3%)	1	1	
No	261(76.8%)	46(65.7%)	1.72(0.99-3.00)	1.47(0.71-3.06)	0.30
Satisfied being a nurse					
Yes	225(66.2%)	41(58.6%)	1		
No	115(33.8%)	29(41.4%)	0.72(0.43-1.22)	0.56(0.28-1.13)	0.11

Note: *= significant association; significant at, * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

7. Discussion

Low Back Pain (LBP) among nursing population is becoming a big issue that has attracted attention because of its public health problems, social and economic burdens. In this study from 410 participants, 340(82.9%) of them experienced low back pain during the last 12 months (95% CI: 78.6%-86.6%). There are many predisposing factors for the occurrence of low back pain among nurses working in ICU. This study found that sex(females), BMI (overweight), long years of experience in ICU, ICU working on shift, poor/crowded work environment, not getting assistance from co-workers, too much Working hours in a week, inadequate rest interval, and fatigue because of the workload were found to be a risk factors for occurrence of LBP. Having regular physical exercise program was found to be the main factor to decrease the risk of developing LBP.

The 12-month prevalence of LBP(82.9%), is similar with a study held in the province of Gaziantep, Turkey which was 84.2% [28], but lower than 90.3% that was a study in South Korean hospitals, [12]. It was reported that, in the Netherlands, the past year back pain prevalence in ICU nurses was 74.9 %, [36] and 58.8 % in public, private and university hospitals in Turkey [8] which shows lower prevalence than this study. Possible reason for this difference in the prevalence of LBP could be the difference in working condition, staffing, socio demography factors and a life style difference between the study populations and life style change through time.

The study conducted in Ethiopia among nurses working in all departments indicated much lower prevalence of 12- month Lower Back Pain 45.8% [8]. This difference could be mainly because of the difference in the task they perform in which this study included only nurses working in ICU. This finding is strengthened by a study held in Egypt which showed that the highest percentage of LBP complaints was among nurses working in the ICU (95.0%) [21].

This study found that the risk of LBP was almost two times higher in females than males. This result may be associated with the anatomic, physiologic and structural difference between the sexes. This might be also because of the low number of male nurses included in this study as an additional reason. On a study held in Gaziantep, Turkey a relationship was found between sex and low back pain, and women were shown to experience more low back pain [28]. This study

is also similar with other previously reported studies [5, 20, 22] which showed that LBP symptoms were consistently more common among females.

The risk of LBP among overweight nurses was 6 times higher than underweight nurses. Those nurses who are in a normal condition also showed significant association with LBP relative to under-weight nurses. According to the study, increasing BMI had shown its own negative effect on the exposure of LBP among nurses. This result was consistent with that of a study in Zagazig University Hospitals, Egypt [21] which reported that high BMI was among the factors which associated with LBP. To the opposite another study conducted among nurses working in ICU in Gaziantep, Turkey, showed that there was no association between LBP with BMI [28]. This variation might be associated with difference in life style, work load, and the difference in working environment. Socio demography factors could have also its own contributions for the variation of the result.

Number of working years in ICUs had a significant relationship with the risk of getting lower back pain. Nurses with >4 years of ICU experience had the greatest likelihood of having low back pain. Those nurses that have greater than 4 years' experience were 11 times more likely exposed to LBP than nurses who had 2 years' experience. This could be an indication how much working in ICU could be the cause and aggravated LBP on nurses working in ICU. The more experience in ICU, the greater severity of low back pain. This result is in line with another study in South Korean hospitals [12] even though the relationship was not linear that the highest low back pain prevalence in South Korean hospitals was on nurses with 2–4 years of working experience.

It was also found that working conditions showed significant associations with low back pain; nurses who worked in shifts had higher low back pain when compared to permanent workers. This finding was similar to the study held in Gaziantep, Turkey, which reported as working in shifts had higher low back pain on average scores [28].

Those nurses who did physical regular exercise were less likely to have LBP. This finding was supported by a study held in Turkey and South–South Nigeria [8, 37] respectively. A systematic review on musculoskeletal disorders [38] also reported as regular exercise had been decreasing the risk level of MSD injuries. Previously high BMI was discussed for being the risk factor for

developing LBP and it is known that regular exercise is considered as an important factor in controlling overweight. From this fact, indirectly it can be an additional reason to conclude as doing physical exercise helped for conditioning the body and contributed to minimize LBP exposure.

On the study held in Ethiopia[7] and on another study in Gaziantep Turkey[28], even-though they found higher prevalence of LBP among nurses who did not go for an exercise program, yet there were no significant association with LBP. In Ethiopia this might be because of the life style and daily activities were more of associated with physical activities before, but nowadays this trend has been changed and physical activities has been becoming restricted because of different technologies are minimizing human physical activities. Life style, working condition, and socio demography factors could be the reasons for the difference of the result in a study of Gaziantep Turkey. The association between exercise program and LBP among nursing staff was still controversial in Seurat too [11]; but still regular exercise had been advisable most commonly in most studies to lower the risk of LBP and maintain a healthy state.

In this study working in a better environment had its own contributions to have been less exposed to LBP. Nurses in a comfortable working environment and well environment were less likely to have LBP. Poor working environment was reported as 64.3% in another study which was held in Ethiopia [7], but nothing was said about its association with LBP. Foreign studies didn't focus on this issue. It might be because of poor working environment was not their problem.

Nurses that didn't get co-workers assistance were two times more likely to have LBP than nurses who got assistance from co-workers. This finding might be associated with high percent of shortage of nurses in the hospitals and this inadequate staffing may increase the occasions that nurses lift or move their patients without the assistance of other nurses, which may lead them to hold unsafe and uncomfortable postures repeatedly. According to the respondents shortage of staffs was reported to be 56.6%, even though it didn't show significant association. In a study of nurses in 39 ICUs of 23 USA hospitals, Magnet-certified hospitals that were known to have positive work relationships and environments for nurses had lower musculoskeletal injury rates than non-Magnet hospitals [39]. This finding was also supported by a study in turkey[8] which

states that nurses that never had adequate assistance from support staff were more likely to have LBP.

Shortage of nurses in ICU may also enforce nurses to cover more time on their work; which means each nurse will have a chance to be exposed more time for nursing activities that are more likely to bring LBP. Therefore in this study with regard to working hours in a week, nurses that worked more than forty hours per week were 5 times more likely exposed to LBP than those who had been working less than forty hours. Consistently with the above finding, nurses with inadequate rest interval were almost 2 times more likely at risk of developing LBP. This result have similarities with the findings in Turkey which explained that daily workload was as one of the risk factor for musculoskeletal disorder including lower back [8].

8. Strength and limitation of the study

Strength:

- ✓ A Standard data collection tool was used and a pretest was carried out to validate the questionnaire.
- ✓ The study included all the study subjects. This enhances the study to decrease error and bias which might be caused because of sampling; and also it helped to maximize the precision or accuracy.
- ✓ Furthermore, day to day supervision was undertaken during data collection to minimize bias.

Limitation of the study:

- ✓ Recall bias
- ✓ The study focused more on Nurses view and self-reports.
- ✓ Another limitation was all work-related factors that could influence back pain prevalence were not considered fully in this study.
- ✓ There were also lack of studies with similar topic and similar methodology in the local context to compare.

9. Conclusion

High prevalence rate of Low Back Pain among Nurses working in ICU were observed, indicating that the problem in the study area is very significant. This study confirmed that among the risk factors; sex(females), BMI (overweight), long years of experience in ICU, ICU work shift status, poor/crowded work environment, not getting assistance from co-workers, too much Working hours in a weak, and inadequate rest interval were found to be a risk factors for occurrence of LBP. Working environment factors were the strongest predictors of LBP among nurses working in ICU when compared to other factors. Having regular physical exercise program was also among the factors; but which may help to reduce the risk of LBP and thus improve workers' productivity and wellbeing.

10. Recommendation

Hospitals

- Hospitals should improve Nurse staffing, and arrange proper resting periods and healthier schedules.
- Need to arrange better working environment with adequate and proper aiding equipment.
- Works should be done to encourage nurses in ICU to have Regular Physical Exercise by arranging places for Physical Exercises like gymnasiums.
- Should Support and give more attention to female nurses working in ICU.
- Hospitals also need to design other possible interventions which reduce prevalence of LBP.

For programmers/ health policy makers

- Emphasis should be given to workers who are occupationally at risk but who are forgotten like in this context ICU nurses.

✓ By Facilitate and support Hospitals;

✓ Arranging trainings and seminars with this issue.

For researchers

- It is very important to undergo a longitudinal study to produce more scientific evidence on risk factors for LBP among Nurses.

References

1. Amirah, F., *Low back pain among nurses in orthopedic and intensive care unit at Universiti Kebangsaan Malaysia Medical Centre.* the incidence, impacts and level of disability.IIUM, December 2011.
2. Olivier B, M.W., Mamabolo M.V, Becker P.J., *The association between psychological stress and low back pain among district hospital employees in Gauteng, South Africa.* South African Journal of Physiotherapy, 2010. 66(2)(17-21).
3. Sikiru L, H.S., *Prevalence and risk factors of low back pain among nurses in a typical Nigerian hospital.* African Health Sciences, Mrach 2010. 10(1).
4. Salameh A, A.A., *Prevalence and risk factors of low back pain among nurses in Sudan Region.* European Scientific Journal November, 2013. 9(33).
5. Hasan M, K., *Prevalence and risk factors of low back pain among nurses in operating rooms, Taif, Saudi Arabia* American Journal of Research Communication, 2013. 1(11).
6. Schirmer, W.C.J., *Nursing injury rates and negativepatient outcomes–connecting the dots.* AAOHN Journal 2007. 55(470–475).
7. Belay MM, G.S., Worku A, Wamish BL *Epidemiology of Low Back Pain among Nurses Working in Public Hospitals of Addis Ababa, Ethiopia.* COSECSA/ASEA Publication -East & Central African Journal of Surgery 2015. . Volume 21 (1).
8. Sezgin D, E.M.N., *Predisposing factors for musculoskeletal symptoms in intensive care unit nurses.* International Nursing Review, 2015. 62: p. 92–101.
9. Gershon RR, S.P., Zeltser M, Faucett J, MacDavitt K & Chou SS, *Organizational climate and nurse health outcomes in the United States.* a systematic review of Industrial Health, 2007. 45 (622–636).
10. Yip, V., *New low back pain in nurses: work activities, work stress and sedentary lifestyle* J Adv Nurs, 2004. 46(4)(doi: 10.1111/j.1365-2648.2004.03009.x): p. 430- 440.
11. Salvi Shah, B.D., *Prevalence of Low Back Pain and Its Associated Risk Factors among Doctors in Surat* International Journal of Health Sciences & Research April 2012. 2(1).
12. June K J, C.S.H., *LBP and work-related factors among nurses in intensive care units* Journal of Clinical Nursing, 2011. 20(3): p. 479-487
13. *National Institute of Neurological Disorders and Stroke, LBP fact sheet* Available from http://www.ninds.nih.gov/disorders/backpain/detail_backpain.htm 14 August 2014.
14. Pınar, R., *Musculoskeletal problems in healthcare Professionals, Antalya.* The 9th National Internal Medicine Congress Book, 2007. 303-306.
15. Cunninham C, F.T., Blake C., *Low back pain and occupation among Irish health service workers.* Occupational Medicine, 2006. 56(7): p. 447 -454.

16. Health, K.N.D.o., *Guide on the Retention Strategy of Employees in the Department, South Africa* Available from:hptt//www.kznhealth.gov.za, April 14, 2010

17. Ng'uurah, J.N., *Health education needs among individuals with low back pain* Available from: hptt// www.uwc.ac.za, 2004 [cited 2008 April 10].

18. Van Vuuren B, V.H.H.J., Zinzen E, Becker P,Meeusen R., *Perceptions of Work and Family Assistance and the Prevalence of Low Back Problems in a South African Manganese Factory, ndustrial Health* 2006. 44(645-651).

19. Lin PH, T.Y., Chen WC, Huang SF., *Prevalence, characteristics, and work-related risk factors of low back pain among hospital nurses in Taiwan: a cross-sectional survey* Int J Occup Med Environ Health. , March 25, 2012. Doi: 10.2478/s13382-012-0008-8.

20. Bener A, D.E., Alnaqbi K. , *Prevalence and correlates of low back pain in primary care: what are the contributing factors in a rapidly developing country? .* Asian Spine J, Jun 8, 2014. 3: p. 227-236.

21. Abou, E., et al., *Prevalence of low back pain in working nurses in Zagazig University Hospitals: an epidemiological study* Egypt Rheumatol Rehabil, 2014. 41: p. 109-115.

22. Sikiru L, S.H., *Prevalence and risk factors of low back pain among nurses in Africa: Nigerian and Ethiopian specialized hospitals survey study* East Afr. J Public Health, 2009. 6(1): p. 22-25.

23. Cho, K.J.J.A.S.-H., *Low back pain and work-related factors among nurses in intensive care units.* Journal of Clinical Nursing 2010. 20(doi: 10.1111/j.1365-2702.2010.03210.x.): p. 479–487.

24. Vieira ER, K.S., Coury HJ & Narayan Y *Low back problems and possible improvements in nursing jobs.* Journal of Advanced Nursing 2006. 55: p. 79–89.

25. Julie M, F., Shannon N, Clifford, *Low Back Pain in Adolescents: A Comparison of Clinical Outcomes in Sports Participants and Nonparticipants* J Athl Train, Jan-Feb; 2010. 45(1): p. 61–66.

26. illiers L, M.S., *Attitudes, knowledge and treatment of low back pain amongst nurses in the Eastern Cape, South Africa* Afr J Prm Health Care Fam Med., 2013. 5(1): p. Art. 535, 8 pages.

27. Dlungwane, T., *Prevalence of Low Back Pain Amongst Nurses at Edendale Hospital* University of KwaZulu-Natal Durban, South Africa, 2010.

28. Ozlem Ovayolu, N.O., Mehtap Genc, Nilgun Col-Araz., *Frequency and severity of low back pain in nurses working in intensive care units and influential factors* Pak J Med Sci 2014. 30(1).

29. Raeisi S, N.M., Golabadi M, Attarchi M., *Combined effects of physical demands and shift working on low back disorders among nursing personnel. .* Int J Occup Saf Ergon, 2014. 20(1): p. 159-66.

30. June J K, C.S., *Low Back Pain and Work Related Factors among Nurses in Intensive Care Units* Journal of Clinical Nursing, 2009. 1-8.

31. Eriksen W, B.D., Knardahl S., *Work Factors as Predictors of Intense or Disabling Low Back Pain: a Prospective Study of Nurses' Aides* Occupational Environmental Medicine, 2004. 61: p. 398-404.

32. Lorusso A, B.S., L'Abbate N. , *A review of Low Back Pain and Musculoskeletal disorders among Italian Nursing Personnel.* 2007. 45: p. 637-644.

33. *Standards of Practice* American Association of Critical Care Nurses (AACN) Available at: http://www.aacn.org/wd/practice/docs/standardsof, 2014.

34. Black, T.R., et al, *Effect of transfer, lifting, and repositioning (TLR) injury prevention program on musculoskeletal injury among direct care* Journal of Occupational and Environmental Hygiene, 2011. 8(4): p. 226–235.

35. Kuorinka I, J.B., Kilbom A, Vinterberg H , Biering-Sorensen F, Andersson G, and Jorgensen K *Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms.* Butterworth & Co (Publishers) Ltd, September 1987. 18(3): p. 233-237.

36. Bos E, K.B., van der Star L & Groothoff J *Risk factors and musculoskeletal complaints in non-specialized nurses, ICU nurses, operation room nurses and X-ray technologists* International Archives of Occupational and Environmental Health 2007(80): p. 198–206.

37. Edward, O.E.J.a.E., *Prevalence and Risk Factors of Low Back Pain among Workers in a Health Facility in South–South Nigeria.* British Journal of Medicine & Medical Research, Article no.BJMMR.20785 ISSN: 2231-0614, NLM ID: 101570965, 2016. 11(8)1-8.

38. Long, M.H., Johnston, V. & Bogossian, F, *Work-related upper quadrant musculoskeletal disorders in midwives, nurses and physicians.* a systematic review of risk factors and functional consequences, Applied Ergonomics, 2012. 43(3): p. 455–467.

39. RR, S.P.G., *Nurse work environments and occupational safety in intensive care units. Policy, Politics, & Nursing Practice.* 2006(7): p. 240–247.

I. Participant information sheet

I. Study information sheet

My name is Wondwosen Yehualaw. And I'm a graduate student on postgraduate study program at Addis Ababa University College of Health Sciences, School of public health. I am conducting a study on "Assessment of self-reported work related low back pain and associated factors among nurses working in Intensive Care Unit (ICU) at Public Hospitals and Private Hospitals, Addis Ababa, Ethiopia."

I am going to ask you some questions related to the study. Please remember that participation in the study is voluntary. You have the right to refuse participation in this study. You can ask questions related to the study at any time. You can refuse to respond to any questions and also stop an interview at any time if you are uncomfortable with it and there are no any negative consequences because of your refusal.

Discomforts and risks

Some of the questions may make you uncomfortable. If this happens, you may refuse to answer these questions if you so choose. The interview may take approximately half an hour of your time. You have the right to stop the interview at any time.

Benefits

By participating in this study and with the crucial information you will provide, awareness can be raised and it will help to know the proportion of nurses working in ICU suffering from low back pain. It helps also to identify risk factors contributing to Low Back Pain Amongst Nurses working in ICU and the possible solution for the factors. Thus this will have a role on reducing the number of morbidity and related risks because of lower back pain among nurses working in Intensive Care Unit (ICU). But it should be clear that there is no monetary benefit from the study.

Rewards

No reward will be given to the respondents who are consented.

Confidentiality

The interview will be conducted in the hospital in a private setting. Your name will not be recorded on the questionnaire. The questionnaire will be kept in good way that keeps confidentiality. Everything will be kept private.

Contact information

If you have any questions you can contact me through my phone no. +251945931099 at any time and Gmail; wondiyeyehualaw@gmail.com; or you can contact the advisor on phone no. +251923940998.

II. Informed consent

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and I am told that I have a full right to ask any questions related to the study. I understand that my records will be kept private and that I can leave the study at any time. I understand that deciding to leave the study will not have any negative consequences on my career. My participation in this study is entirely voluntarily and we can continue the interview.

Date……

Signature/ Thumb print of the Participant ……

Name of the data collector**……**

Signature……

001 ID No._____

002 Name of the hospital_____ (____) _ (if the Hospital is public put '1' and if it is private put 2 inside the bracket)

II. Questionnaire

A structured questionnaire for assessment of self-reported work related low back pain and associated factors among nurses working in Intensive Care Unit (ICU) at Public Hospitals and Private Hospitals, Addis Ababa, Ethiopia, in 2017.

Table 9: Questionnaire

S. No.	Questions	Categories	Skip
	Part one: Socio-demographic Characteristics		
101	How old are you?	----------years	
102	What is your sex?	1. Female 2. Male	
103	What is your height?	----------cm. tall	
104	What is your weight?	----------Kg.	
105	What is your marital status?	1. Married 2. Single 3. Divorced 4. Widowed 5. Living separately	
106	What is the highest Educational Level you completed?	1. Diploma 2. Degree 3. Masters/PhD 4. Other/ Specify	
107	How much is your monthly income?	----------ETB.	
	Part two: Individual (personal) Factors		
201	How many years have you been practicing as a nurse?	----------years	
202	How long have you worked in ICU?	----------	
203	How is your ICU work shift status?	1. Permanently ⟶ 2. Shift worker	Q. 205
204	If rotating, how often are you rotated to other wards?	1. Every 3 month 2. Every 6 month 3. Yearly 4. Other/ Specify. ----------	

205	Which ICU you are currently working in?	1. Pediatrics 2. General medicine 3. Specialty medicine 4. General surgery 5. Specialty surgery 6. Neonatology 7. Mixed 8. Other/ specify. ----------	
206	Have you taken special training on ICU?	1. Yes 2. No	
207	Have you Knowledge on Back Ergonomics?	1. Yes 2. No	
208	Have you a habit of doing regular exercise?	1. Never exercise 2. Sometimes(1-3days/weak) 3. Usually(≥4 days/weak)	
209	Do you smoke cigarettes?	1. Yes 2. No	
210	Do you drink alcohol?	1. Yes 2. No	
	Part Three: Low Back Pain (LBP) status		
301	Have you had low back pain in the last 12 months since you were working as a nurse?	1. Yes 2. No →	Q. 501
302	What best describes the intensity of your LBP?	1. Mild 2. Moderate 3. Severe	
303	Have you ever been hospitalized because of low back pain in the last 12 months?	1. Yes 2. No	
304	Have you ever thought to change your job because of low back pain?	1. Yes 2. No	
305	How often you feel pain on your low back?	1. Infrequent (<3 days/ weak) 2. Frequent (3-5 days/ weak) 3. Daily pain (6-7 days/ weak)	
306	Do you feel Pain to Lower Extremities and other body parts?	1. Yes 2. No	
307	Have you had low back pain during the last 7 days?	1. Yes 2. No	
308	Did you ever suffer from LBP before working as a nurse?	1. Yes 2. No	
309	Has the LBP affected you outside of work in terms of activities of daily living and leisure activities?	1. Yes 2. No	
310	Have you ever been absent from work in the past year due to your low back pain?	1. Yes 2. No	

	Part four: Occupational and ergonomic Factors		
401	Was your LBP due to your profession?	1. Yes 2. No	
402	Which work activities in ICU are the cause for your low back pain/ or aggravated your low back pain? (You can choose (circle) more than one factor).	1. Giving Medication 2. Bending or Twisting 3. Lifting 4. Positioning of patients on bed 5. Maintaining a position for a prolonged period of time. Please specify the Posture. E.g. standing, sitting, kneeling or bent over. ---------- 6. Performing repetitive tasks 7. Transferring a patient 8. Working in an awkward or cramped position 9. Working when physically fatigued 10. Pushing or pulling 11. Other. Please specify:---------- ----------	
403	Was working in ICU the cause for your low back pain/ or aggravated your low back pain?	1. Yes 2. No	
404	How is your work condition status	1. Day 2. Night 3. Sometimes Day sometimes night on shift 4. Permanently on day/night duty	
405	Did you feel pain on your low back more at night shift different from the day shift relatively?	1. Yes 2. No	
406	Do you believe that working nursing activities at night aggravated your low back pain?	1. Yes 2. No	
	Part five: Environmental factors		
501	How is your work environment status? (observational)	1. comfortable ⟶ 2. well 3. Bad/ crowded	Q. 503

502	Do you believe that your work environment status have a role to the pain on your low back?	1. Yes 2. No	
503	Do you ask for assistance when Performing patient handling activities?	1. Yes 2. No	
504	Do you use assistive devices with patient Handling activities?	1. Yes 2. No	
505	On average how many hours in a week do you work?	----------hrs. a weak	
506	Have you adequate rest interval?	1. Yes 2. No	
507	Is their shortage of staffs In your working unit?	1. Yes 2. No	
	Part six: Psychological Factors		
601	Are you satisfied for being a nurse	1. yes 2. No	
602	Are you comfortable with your daily nursing activities in the ICU?	1. Yes 2. No	
603	Have you Mental stress due to you have been working in ICU?	1. yes 2. No	
604	Do you have Sleep disturbance due to your work in ICU?	1. Yes 2. No	
605	Are you Bothered by feeling senseless and Little pleasure due to your work in ICU?	1. Yes 2. No	
606	Do you feel fatigue because of daily workload during your work?	1. Yes 2. No	
607	Are you satisfied with the income you get from your work?	1. Yes 2. No	
608	Generally How much you are satisfied with your work?	1. Very dissatisfied 2. Dissatisfied 3. Neutral 4. Satisfied 5. Very satisfied	

_____.

Thank you very much for your Cooperation!

III. የተሳታፊዎች መረጃ መስጫ ቅጽ-በአማርኛ

እንደምን አደሩ/ዋሉ?

ወንድወሰን የኋላው እባላለሁ፡፡ በአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና ሳይንስ ኮሌጅ የ3ኛ ዓመት የህብረተሰብ ጤና ትምህርት የማስትሬት ድግሪ ተመራቂ ተማሪ ነኝ፡፡ በአሁኑ ሰዓት ከስራ ጋር በተያያዘ የታችኛው የወገብ ክፍል የህመም ስሜት በጽኑ ህክምና ማእከል(አይ ሲ ዩ) ክፍል ውስጥ በሚሰሩ ነርሶች ላይ ያለበት ደረጃ በአዲስአበባ በሚገኙ የመንግስት እና የግል ሆስፒታሎች፤በ2009 በሚል ርእስ ጥናት በማካሄድ ላይ ነኝ፡፡

የጥናቱ አላማ፡ በጽኑ ህክምና ማእከል ክፍል(አይ ሲ ዩ) ውስጥ በሚሰሩ ነርሶች የታችኛው የወገብ ክፍል የህመም ስሜት ያለበትን ደረጃ ማዎቅና ለችግሩ መከሰት የሆኑ ምክንያቶችን መለየት እና የመፍትሄ ሃሳብ ማስቀመጥ፡፡ ስለዚህ የተወሰኑ ጥያቄዎችን ልጠይቅዎት እወዳለሁ፡፡ በሙሉ ፈቃደኝት እንዲሳተፉ እየጠየቅሁ ጥያቄ ካለዎት በማንኛውም ግዜ ማንሳት ይችላሉ፡፡ ያለመሳተፍ ወይም በማንኛውም ጊዜ ራስዎን ከጥናቱ የማግለል ሙሉ መብት አለዎት፡፡ ጥናቱን ለመሳተፍ ፍቃደኛ ባለመሆንዎ ምንም አይነት የሚደርስብዎ ችግር አለመኖሩን ላረጋግጥልዎ እዎዳለሁ ፡፡

የጎንዮሽ ጉዳት፡- ቃለመጠይቁ ወደ ግማሽ ሰአት የስራ ሰአትዎን ሊወስድ ይችላል፡፡ የተወሰኑ የማይመችዎ ጥያቄዎችም ሊኖሩ ይችላሉ፡፡ የማይመችዎ ጥያቄዎች ካሉ ሳይመልሱ ማለፍ ይችላሉ፡፡ ከዚህ ዉጭ ግን በዚህ ጥናት መሳተፍ ምንም አይነት ጉዳት የለውም፡፡

ጥቅማ ጥቅም፡- በዚህ ጥናት መሳተፍ በዚህ ችግር ዙሪያ ያለዉን የግንዛቤ ደረጃ ከፍ ለማድረግ ይረዳል፡፡በተጨማሪም በዚህ ችግር እየተጠቁ ያሉትን እና ለችግሩ ምክንያቶችን መለየት የሚያሥችል ሲሆን ይህ ማለት ደግሞ ጥናቱ በዚህ ዙሪያ ለሚደረሱ ስቃዮችና ጉዳቶች በመቀነስ ረገድ ከፍተኛ አስተዋጽኦ ይኖረዋል፡፡የእርስዎ በእውነት ላይ የተመሰረተ መልስ ለዚህ ጥናት መሳካት አስተዋፅኦ ያደርጋል፡፡ ነገር ግን በዚህ ጥናት መሳተፍ የገንዘብ ጥቅም አይኖረዉም፡፡

ሚስጥራዊነቱ፡- ቃለመጠየቁ የሚደረገዉ በግል ነዉ፡፡ ስምዎትም በጥያቄዉ ላይ አይሰፍርም፡፡ እርስዎ የሚሰጡት መረጃ ከአጥኚውና ቃለመጠይቅ አድራጊው በስተቀር በማንኛውም መልኩ ለሌላ 3ኛ ወገን ተላልፎ አይሰጥም፡፡ መጠየቅዎም ሚስጥርን በጠበቀ መልኩ የሚቀመጥ ይሆናል፡፡

ጥናቱን በተመለከተ ምንም አይነት ጥያቄ ካለዎት በሚከተለዉ አድራሻየ ማግኘት የሚችሉ ይሆናል፡፡

ስ.ቁ. 09 45 93 10 99

ኢ.ሜይል፡ wondiyeyehualaw@gmail.com

በተጨማሪም አማካሪ መምህራን በስ.ቁ. 09 23 94 09 98 ማግኘት ይችላሉ፡፡

IV. የስምምነት መግለጫ ፎርም - በአማርኛ

የዚህ ጥናት ዓላማ በደንብ የተብራራልኝ ሲሆን የጥናቱንም ዓላማ ተረድቻለሁ፡፡ በዚሁ ጥናት ላይ መሳተፍ በሙሉ ፈቃደኝነት ላይ የተመሰረተ መሆኑን በሚገባ የተረዳሁ ሲሆን በማንኛውም ጊዜ ጥያቄ መጠየቅና እንዲሁም ካልተመቸኝም ከጥናቱ ራሴን የማግለል መብት እንዳለኝ አውቂአለሁ፡፡ከጥናቱ ራሴን በማግለሌም ምንም የሚደርስብኝ ችግር እንደሌለም ተረድቻለዉ፡፡ስለሆነም የምሰጠው መረጃ እስከተጠበቀ ድረስ በዚህ ጥናት ለመሳተፍ ተስማምቻለሁ፡፡

የመረጃ ሰጪው ፊርማ _____ ቀን _____

የአጥኚው ፊርማ _____ቀን _____

001 የመጠየቁ መለያ ቁጥር_____

002 የሆስፒታሉ ስም _____(____)_(የመንግስት ከሆነ ‘1’ የግል ከሆነ ድግሞ ‘2’ ተብሎ በቅንፍ ዉሥጥ ይቀመጥ

V. መ ጠ ይቅ፤ አማ ርኛ ቅጽ

ይህ መጠይቅ የተዘጋጀዉ ከስራ ጋር በተያያዘ የታችኛዉ የወገብ ክፍል የህመም ስሜት በጽኑ ህክምና ማእከል(አይ ሲ ዩ) ክፍል ዉስጥ በሚሰሩ ነርሶች ላይ ያለበት ደረጃ በአዲስአበባ በሚገኙ የመንግስት እና የግል ሆስፒታሎች ያለበትን ደረጃ በተመለከተ መረጃ ለማሰባሰብ ነዉ

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች	ይለፉ
	ክፍል 1፡ ሥነ- ህዝብ እና ማህበራዊ መገለጫ		
101	የእርስዎ ዕድሜ ስንት ነዉ?	----------አመት	
102	ጸታዎ ምንድን ነዉ?	ወንድ.....1 ሴት.....2	
103	ቁመትዎ ምን ያህል ነዉ?	----------ሴ.ሜ	
104	ክብደትዎ ምን ያህል ነዉ?	----------ኪ..ግ.	
105	የጋብቻ ሁኔታዎ?	ያገባ/ች.....1 ያላገባ/ች.....2 የተፋታ/ች.....3 ሚስቱ የሞተችበት/ባሏ የሞተባት.....4 ተለያይተዉ የሚኖሩ.....5	
106	የትምህርት ደረጃዎ?	ዲፕሎማ.....1 ድግሪ.....2 ማስተርስ.....3 ሌላ (ይጠቀስ) 99	
107	በወር ምን ያህል ገቢ ያገኛሉ?	----------ብር	
	ክፍል 2፡ የግለሰብ ነገሮችና ምክንያቶችን በተመለከተ		
201	በነርስነት ምን ያህል ግዜ ሰራህ/ሽ?	----------አመት	
202	በጽኑ ህክምና ማእከል ክፍል (አይ ሲ ዩ) ዉስጥ መስራት ከጀመርሽ ምን ያህል ግዜ ሆነህ/ሽ?	----------	
203	በጽኑ ህክምና ማእከል ክፍል(አይ ሲ ዩ) ዉስጥ የስራ ሁኔታዎ እንዴት ነዉ?	በቋሚነት.....1 → ጥያቄ 205 በተራ.....2	
204	በተራ ከሆነ በምን ያህል ግዜ ትቀያየራላችሁ?	በየ3 ወር.....1 በየ6 ወር.....2 በየ አመቱ.....3 ሌላ (ይጠቀስ). 99	

205	የትኛዉ አይ ሲ ዩ (የጽኑ ህክምና ማእከል) ዉስጥ እየሰራህ ትገኛለህ/ሽ?	የህጻናት ክፍል(Pediatrics)……1 አጠቃላይ ህክምና(General medicine)….2 ባንድ አይነት ህክምና የተለየ ክፍል (Specialty medicine) ……3 አጠቃላይ ቀዶ ጥገና (General surgery)..4 ባንድ አይነት ህክምና የተለየ ቀዶ ጥገና ክፍል(Specialty surgery)……5 የጨቅላ ህጻናት ክፍል/Neonatology…….6 ሁሉም ባንድ ላይ/ Mixed……..7 ሌላ (ይጠቀስ). ……..99	
206	አይ ሲ ዩ ክፍል (ጽኑ ህክምና ማእከል ክፍል) ዉስጥ ለመስራት የወሰዱት የተለየ ስልጠና አለ?	አዎ……..…1 የለም……..…..2	
207	በስራ ላይ የጀርባ ደህንነትን በተመለከተ እዉቀቱ አለዎት?	አዎ……..1 የለም……2	
208	የአካል ብቃት እንቅስቃሴ የማድረግ ልምዱ አለዎት?	እንቅስቃሴ አድረጌ አላዉቅም……..1 አንዳንድ ግዜ አደርጋለሁ(ከ1-3) ቀኖች/በሳምንት) ……....2 አብዛኛዉን ግዜ አደርጋለሁ(≥4 ቀኖች)……3	
209	ሲጋራ ታጨሳለህ/ሽ?	አዎ……..1 የለም……2	
210	አልኮል ትጠጣለህ/ሽ?	አዎ……..1 የለም……2	
	ክፍል 3፡ የታችኛዉ የጀርባ ክፍል የህመም ስሜት ሁኔታ		
301	በነርስነት መስራት ከጀመሩ ግዜ ጀምሮ ባለፉት 12 ወራት ዉስጥ ታችኛዉ የጀርባህ/ሽ ክፍል ላይ የህመም ስሜት ተሰምትዎት ያዉቃል?	አዎ……1 የለም----------2 ⟶	ጥያቄ 501
302	የህመሙን ስሜት ክብደት እንዴት ይገልጹታል?	መጠነኛ……..1 መካከለኛ የህመም ስሜት…….....2 ከባድ የህመም ስሜት……..……..3	
303	በህመሙ ምክንያት ባለፉት 12 ወራት ግዜ ዉስጥ ህክምና አድርገዉ ያዉቃሉ?	አዎ……1 የለም……2	
304	በህመሙ ምክንያት ስራዎትን ለመቀየር አስበዉ ያዉቃሉ?	አዎ……..1 የለም……2	
305	በምን ያህል ግዜ ህመሙ ይሰማዎታል?	አንዳንድ ግዜ ብቻ (<3 ቀኖች/ በሳምንት)--1 ተደጋግሞ ይሰማኛል(3-5 ቀኖች/ በሳምንት) ----------2 ሁልግዜ(6-7 ቀኖች/ በሳምንት)-----3	

306	ህመሙ ወደ ታችኛዉ የእግርህ ክፍልና ወደ ሌላዉ የሰዉነትህ ክፍል ይሰማዎታል ወይ?	አዎ----------1 የለም----------2	
307	የታችኛዉ የጀርባ ክፍል ህመምዎ ባለፉት ሰባት(7) ቀናት ግዜያት ዉስጥ ተሰምትዎት ያዉቃል?	አዎ----------1 የለም----------2	
308	ነርስ ከመሆንዎ በፊት ይህ የታችኛዉ ጀርባ ክፍል ህመምዎ ተሰምትዎት ያዉቅ ነበር?	አዎ----------1 የለም----------2	
309	ታችኛዉ የጀርባህ/ሽ ክፍል ላይ የህመም ስሜት መኖሩ ከመደበኛ ስራህ ዉጭ ባለዉ የቀን ተቀን የህየወትህ እንቅስቃሴ ዉስጥ ተጽእኖ ፈጥሮብሃል ወይ?	አዎ----------1 የለም----------2	
310	በታችኛዉ የጀርባዎ ክፍል ላይ በተፈጠረብዎ የህመም ስሜት ምክንያት ከስራ ቀርተዉ ያዉቃሉ ?	አዎ----------1 የለም----------2	
	ክፍል 4፡ ከስራ አና ከስራ ደህንነት ጋር በተያያዘ		
401	በታችኛዉ የጀርባዎ ክፍል ላይ የተፈጠረብዎ የህመም ስሜት በመደበኛ የነርስነት ስራዎ ምክንያት ነዉ?	አዎ----------1 የለም----------2	
402	የትኛዉ የሥራ እንቅስቃሴዎ ለታችኛዉ የጀርባዎ ክፍል ህመም መንስኤ ወይም መባባስ ምክንያት ነዉ? (ካንድ በላይ ምርጫ ሊኖሩት ይችላሉ)	መድሃኒት ለታካሚ መስጠት……..….1 ማጎበጥ ወይም መጠምዘዝ……..…2 እቃ ማንሳት…….……...3 ታካሚዎችን አልጋቸዉ ላይ ማመቻቸትና ማስተካከል……4 ለረዥም ግዜ ተመሳሳይ የስራ አቋቋም ይዞ መቆየት፡፡ከሆነ እባክዎን ለረዥም ግዜ የቆዩበትን ተመሳሳይ የስራ አቋቋም ይግለጹ ? ለምሳሌ መቆም፤ መቀመጥ፤ መንበርከክ፤ ማጎበጥ ዎይም ሌላ ? ……5 በተደጋጋሚ ተመሳሳይ ተግባሮችን ማከናወን...6 ታካሚን ማሸጋገር…….……....7 በማይመችና አስጨናቂ በሆነ ሁኔታ ዉስጥ መስራት……8 በድካም ዉስጥ ሁኖ መስራት…….....9 መግፋት ወይም መሳብ……..10 ሌላ (ይጠቀስ). ……...99 ----------	

403	በጽኑ ህክምና ማእከል ክፍል (አይ ሲ ዩ) ክፍል ዉስጥ መስራትዎ ለታችኛዉ የጀርባዎ ክፍል የህመም ስሜት መባባስ ወይም ደገሞ መነሻ ምክንያት ነዉ?	አዎ----------1 የለም----------2	
404	የስራ ፈረቃዎ እንዴት ነዉ?	የቀን----------1 ማታ----------2 አንዳንዴ የቀን አንዳንዴ የማታ በፈረቃ ----------3 ቀንም ማታም በቋሚነት ----------4	
405	ማታ ማታ የህመምዎ ስሜት ቀን ላይ ከሚሰማዎ የህመም ስሜት የበለጠ ነዉ?	አዎ----------1 የለም----------2	
406	የማታዉ ፈረቃ ስራ የህመሙን ስሜት አባብሶብኛል ብለዉ ያስባሉ?	አዎ----------1 የለም----------2	
	ክፍል 5፡ የአካባቢ ሁኔታ		
501	የስራ አካባቢዎ ሁኔታ እንዴት ነዉ?	ምቹ 1 ⟶ ደህና----------2 መጥፎ/ የተጨናነቀ----------3	ጥያቄ 503
502	የአካባቢዎ ሁኔታ ለህመምዎ መባባስ አስተዋጽኦ አለዉ ብለዉ ያሥባሉ?	አዎ----------1 የለም----------2	
503	በታካሚዎች የአያያዝ እና እንክባካቤ እንቅስቃሴ የሌሎችን እርዳታ ይጠይቃሉ?	አዎ----------1 የለም----------2	
504	በታካሚዎች የአያያዝ እንቅስቃሴ መርጃ መሳሪያዎችን ይጠቀማሉ?	አዎ----------1 የለም----------2	
505	በአማካኝ በሳምንት ምን ያህል ሰአት ይሰራሉ?	----------ሰኣት አሰራለሁ	
506	በቂ የእረፍት ግዜ አለዎት?	አዎ----------1 የለም----------2	
507	እርስዎ በሚሰሩበት ክፍል ዉስጥ የሰራተኛ እጥረት አለ?	አዎ----------1 የለም----------2	
	ክፍል 6፡ ስነ አእምሮአዊ ሁኔታዎች/ ምክንያቶች		
601	ነርስ በመሆንዎ እርካታ ይሰማዎታል?	አዎ----------1 የለም----------2	
602	በእለታዊዉ የስራዎት እንቅስቃሴ ደስተኛ ነዎት?	አዎ----------1 የለም----------2	
603	ከስራዎ ጋር በተያያዘ የአምሮ ጭንቀት አለብዎ?	አዎ----------1 የለም----------2	
604	ከስራዎ ጋር በተያያዘ የእንቅልፍ መረበሽ አለብዎ?	አዎ----------1 የለም----------2	
605	ከስራዎ ጋር በተያያዘ በስሜት ማጣትና ደስታ አለማግኘት ችግርስ ይረበሻሉ?	አዎ----------1 የለም----------2	
606	በስራ ሰአት ከስራዉ ክብደት/ጫና ጋር በተያያዘ የድካም ስሜት ይሰማዎታል	አዎ----------1 የለም----------2	
607	ከስራክ/ሽ በምታገኘው/ኚው ገቢ ደስተኛ ነህ/ሽ?	አዎ----------1 የለም----------2	
608	በአጠቃላይ በስራዎት ምን ያህል ደስተኛ ነዎት?	በጣም ደስተኛ አይደለሁም----------1 ደስተኛ አይደለሁም----------2 መካከለኛ----------3 ደስተኛ ነኝ----------4 በጣም ደስተኛ ነኝ----------5	

ስለ ትብብርዎ በጣም እናመሰግናለን!

ASSURANCE OF PRINCIPAL INVESTIGATOR

I agree to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Research.

Name of the student: _____

Date._____ Signature _____

Approval of the primary Advisor

Name of the primary advisor:_____

Date._____ Signature _____