# WORK RELATED MUSCULOSKELETAL DISORDER AND ITS ASSOCIATED FACTORS AMONG NURSES WORKING IN JIMMA ZONE PUBLIC HOSPITALS, SOUTH WEST ETHIOPIA.

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**A THESIS SUBMITTED TO JIMMA UNIVERSITY COLLEGE OF HEALTH SCIENES DEPARTMENT OF NURSING AND MIDWIFERY, IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF MASTERS OF SCINCE DEGREE IN ADULT HEALTH NURSING (Msc.)**

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## ABSTRACT

**Background -** *Hospital nursing is a high-risk occupation for developing work-related Musculoskeletal Disorders like low back pain/injury, neck and shoulder and problems have been reported to be common among nursing personnel. Musculoskeletal disorders represent a significant occupational problem among nurses; however, there is paucity of information on work related musculoskeletal disorder among nurses in Ethiopia.*

**Objective:** *To assess work related musculoskeletal disorder and its associated factors among nurses working in Jimma Zone Public Hospitals, South west Ethiopia.*

**Method**-- *Institutional based cross-sectional study was conducted in Jimma Zone public Hospitals from March* 12-27, 2015. *The study was conducted on 333 participants .Sample size was proportionally allocated to the respective hospitals. The participants were selected by systematic random sampling technique quantitative data and qualitative informants were selected purposely. Quantitative data were entered in to computer by using Epi-data 3.1 version and then it was exported to SPSS version 21.0 and cleaned for analysis. Percentage, Frequency, mean and standard deviation were calculated. Odds ratio with 95% confidence interval was used to examine associations between dependent & independent variables. P. value less than 0.05 was considered significant. Results were summarized and presented by tables and charts. Qualitative data were triangulated to the major objective areas.*

**Results:** *- Three hundred thirty three questionnaires distributed and 301 returned yielding response rate 90.3%. The mean age of respondent's was 26.6±5.7years. One hundred fifty nine 159(52.8%) were male and 180(59.8%) were single. A 12-month prevalence of Work related Musculo skeletal Disorders at anybody site was 60.8% and highest report was seen in the low back one 124( 67.8%) followed by the neck 44(24%) and knees 43(23.6%).Lifting and transferring dependent patients [AOR 2.1(1.1-4.3)], wound care [AOR 4.2(1.9-8.9)], medical ward [AOR 9.6(2.4-38.3)] and theatre/Intensive care unit [AOR 3.4 (1.2-9.7)], Working in awkward* and cramped position *[AOR 9.7 (2.2-42.6)]***,** *Working in the same positions for long period [AOR, 6.1(1.3-28.7)] and Bending or twisting back during work [AOR 5.1(1.1-23.7)] were independent predictors of Work related Musculo skeletal disorder.*

**Conclusion and Recommendation –** *the prevalence of Work related Musculo skeletal disorder among nurses working in Jimma zone public hospitals was 60.8%. Lifting and transferring dependent patients, wound dressing, working with confused patients, working unit, working in awkward postures, working in the same positions for long period and Bending or twisting back during work were significant factors associated with work related musculoskeletal disorder among nurses. In service refreshment training about Safe patient handling and ergonomics and creating conducive working environment were recommended*



**Key Words***: work related musculoskeletal disorder, predictors, nurses, Jimma*

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## List of Abbreviations

| | |
|---|---|
| ANA | American Nursing Association |
| CHS | Collage of Health Science |
| DMQ | Dutch Musculo skeletal Questionnaires |
| ICU | Intensive Care unit |
| JU | Jimma University |
| JUTH | Jimma University Teaching Hospitals |
| MSD | Musculoskeletal Disorder |
| SPSS | Statistical Package for Social Sciences |
| SD | Standard Deviation |
| WRMSDs/WMSD | Work related musculoskeletal disorder |

# CHAPTER ONE: INTRODUCTION

## 1.1. Background

Work related musculoskeletal disorders (WMSDs) refers to disorders of muscles, skeleton, and related tissues as a results of work related event or activities (1,2) which characterized by muscles, joints, tendons and ligament pain weakness, swelling, burning , numbness, tingling or dull ache over affected area. The major body region involved lower back area, upper and lower limb extremities (3). According to Bureau of Labour Statistics Work-related musculoskeletal disorders (WMSD) are conditions in which the work environment and performance of work contribute significantly to the condition and/or the condition is made worse or persists longer due to bending, climbing, crawling, reaching, twisting, overexertion, or repetitive motion(4).

Commonly reported WMSD are Sprains, strains, and tears, Back pain, Carpal tunnel syndrome, tendonitis, tenosynovitis and Bursitis (4-6).

WRMSDs can be prevented by one or a combination of Having good physical appearance or proper posture; working only what they can work(optimal load); be technical when lifting and lowering objects; use appropriate equipments and strengthen muscles and connective tissues by regular physical activity and proper nutrition(7).

The purpose of this study is therefore, to assess WMSD and its associated factors related among nurse in Jimma Zone Public Hospitals.

## 1.2 .Statement of the Problem

Work related musculoskeletal disorders are the major cause of morbidity and mortality around the world. For instance including nurses there is estimated 2 million deaths , 160 million new cases, more than 4.2 million cases of nonfatal injuries/ illnesses, 70 million physician consultations and 130 million hospital outpatient and emergency room visit each year worldwide (8,9,10,12)

Nursing, among the profession with high workload is a high-risk for developing work-related MSDs. For example, low back pain/injury, neck and shoulder and problems have been reported to be common MSDs among nursing personnel (13, 14, 15).

The magnitude of WMSD varies from region to region. Bureau of Labour Statistics reports, annual prevalence at any of body region between 40%-85% among both Asian populations and Western populations (16). In Nigeria, 84.4% of the nurses have had WMSDs once or more in their occupational lives (17).

The consequence of MSD generate not only suffering and disability for workers and their families, but also result in high costs for society, considering losses in productivity and wages, benefits paid to workers and medical expenses(10). In 2002, about 1.24 billion dollars paid out for work-related injuries, 40% of which were considered to be MSD **(**11**).**It is the biggest cause of absence from work and Overexertion injuries might cause nurses to leave their profession (7,14)

Nurses in Africa are arguably the most important health care workers available in most sub-Saharan nations, performing a broad range of tasks and working in settings where no other health workers, including physicians, are available (18).

Significant factors associated with WRMSD among nurses are frequent/repetitive works , working in awkward postures, lifting of heavy objects, daily exposure to whole body vibration, routine overhead work, work with the neck in chronic flexion position, performing repetitive forceful tasks, organizational factor ,Psychosocial factors( work pace, autonomy, monotony, work/rest cycle, task demands, social support from colleagues and management and job uncertainty) and Individual factors( age, gender, professional activities, alcohol/tobacco consumption) (3,4,5,19,20,21).

Musculoskeletal disorders represent a significant problem among nurses; however, to best of researcher knowledge there is paucity of information on WMSD among nurses in Ethiopia in general and Jimma zone public hospital in particular. Thus, this study aimed at investigating WMSD and its associated factors among nurses in Jimma zone public hospitals.

# CHAPTER TWO

## 2.1. Literature Review

Cross-sectional study, conducted by Pahlevan D et al on Association of Musculoskeletal Complaints with Psychosocial Factors among Nurses in Semnan Hospitals in Iran, shows 93.7% expressed MSDs with involvement of at least one site. The most common MSDs were low back (66.1%), neck (65.4%) and knee (59.4%) (13).

The result of cross-sectional study conducted by Amin et al among 660 public hospital nurses in Malaysia, to assess relationship between Psychosocial Risk Factors and Work-Related Musculoskeletal Disorders among Public Hospital Nurses in Malaysia with sample size of 468, shows 73.24% of nurses experienced discomfort or pain in at least one site of the musculoskeletal system of which neck accounted (48.94%), feet (47.20%), the upper back (40.69%) and the lower back (35.28%) (16).This research used only female nurses as study unit.

The study conducted on musculoskeletal disorders among professional nurses in mainland China, showed that the prevalence of musculoskeletal disorder was 70%, with lower back 56.7%, neck 42.8%, shoulders 38.9 % and upper back 38.9 %(22).

The other study conducted in Netherlands on Work related risk factors for musculoskeletal complaints in the nursing profession: results of a questionnaire survey indicated that the prevalence of musculoskeletal disorder was 57%, with complain on the lower back 33.8%, neck 22.9% and Knee 10.2%. Age, non-managerial tasks, duration of employment, and the number of working hours a week significantly associated risk factors for different body regions (23).

The cross-sectional exploratory study done by Foncika on Factors Related to Musculoskeletal Disorders in Nursing Workers with nursing auxiliaries and technicians from a public hospital in the city of Salvador-BA, in Brazil on 293 randomly selected female nurses ,shows the prevalence of MSDs in neck, shoulder or upper back was 57.1%, in the low back region 53.9%, and in distal upper extremities 32.8%.This study also indicated that MSD in the region of neck, shoulder or upper back, and low back was associated with physical demand (heavy lifting, poor posture of the back and repetitive gestures) , Psychosocial demands, perception of poor physical condition, years of work (≥ 19) and marital status (not married), in addition to this law back region also associated with perception of poor physical fitness and obesity while MSD in distal upper extremities

were associated with physical demand, repetitiveness and force and years of work (≥ 19) (10).However, this study used only female population which can not indicate sex as independent variable.

According to the cross-sectional study conducted between February and September 2005, by Choobineh A et al on Association between Perceived Demands and Musculoskeletal Disorders among Hospital Nurses of Shiraz University of Medical Sciences: A Questionnaire Survey in Iran with sample size of 641 randomly selected nurses from 12 hospital: showed that 12 months prevalence of MSDs was 84.4%. Lower back symptoms (54.9%) were found to be the most prevalent problem. perceived physical demands like moving/ lifting heavy loads, awkward posture, static posture, applying pressure with hands/fingers, and intensive physical efforts were significantly associated with MSDs of different body regions(20).

According to the survey study conducted by Anap DB et al , to assess work related musculoskeletal disorders among hospital nurses in rural Maharashtra, in India: a multi centre survey of total sample 250, the prevalence of WMSDs was in the low back (48.2%), shoulder 34.6%), neck (33.1) and knee (29 %). This study shows the associated risk factors with WMSDs were working in same position for long time, bending, twisting, lifting and treating excessive number of patients(24). Other cross sectional study conducted in Japan by Ando s et.al on Associations of self estimated workloads with musculoskeletal symptoms among hospital nurses not indicated the association between works related musculoskeletal pain and patient condition like patients with disabilities while accepting emergency patients has high Ratio of Risk(25).

A result of cross-sectional study done in Uganda by Munabi et al, to assess the work related musculoskeletal disorders and associated risk factors among nursing professionals in Uganda among 890 nurses selected from 5 hospitals, indicated that the 12-month period-prevalence of MSD at anybody site was 80.8%. The most common site of MSD was the lower back (61.9%). Alcohol consumption, smoking, often working in a slightly bent posture, often working in a slightly twisted posture for long, mental exhaustion, being absent from the work station for more than 6 months due to illness or an accident and feeling rested after a break were significant risk factors while number of children and having part time job were not significant (18).

In Nigeria, a cross-sectional survey conducted by Tinubu et al, to determine the lifetime, 12 months period and point prevalence of WMSDs; the associated job risk factors and the coping strategies toward reducing the risk for development of WMSDs among nurses from selected hospitals in Ibadan, South-west Nigeria, with sample size of 118: indicated that 84.4% 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%). According to this study, clinical experience > 20 years, working in the same positions for long periods, lifting or transferring dependent patients and treating an excessive number of patients in one day were the most perceived job risk factors for WMSDs, while inadequate training, working with disoriented patients, bending or twisting back and other job risk factors were not significant (17).

The Other cross-sectional, study conducted between May and July, 2010 in Nigeria by Adeaga D. on the relationship between work-related physical factors and low back pain (lbp) among nurses in university college teaching hospital (Uch), Ibadan, Oyo state, Nigeria, on purposively selected 400 nurses shows that the life time and 12months prevalence of LBP was 74.3% and 49.7% respectively. Working in the medical, surgical wards and OR/ICU were significantly associated with Low Back Pain but Rank of nurses, work experiences and work shift were statistically insignificant and from nursing activities only following patients vital signs is significant while administering medication, wound dressing, bed bathe and bed making were not significant (26).

The result of research done from January to June 2010 by A. Jellad et al in Tunisia, to assess musculoskeletal disorders among Tunisian hospital staff: Prevalence and risk factors with 520 sample size indicated that the prevalence of MSD was 65.4%. Which occurred mostly in low back (74.5%), neck (38.1%), and knees (31.1%).Factors associated to MSD were age, female gender , and years of service as well as tenure, extra professional activities , prolonged sitting and standing were also significantly associated with MSD . No significant association was found between repetitive movement, uncomfortable postures, heavy load handling, working on night shifts, stress and the presence of MSD (27). However this study included all hospital staff.

Physical activities, non height adjustable bed, previous occupation before employed as a nurse and work environment (3, 26) may have relation with work related musculoskeletal disorder but the articles that showed their association could not found.

## 2.2. Conceptual Framework

Conceptual frame work for this study developed after review of relevant literatures (11, 17- 18, 24-26, & 28) and adapted. The box used to separate independent variables and the direction of arrow shows the relation between independent and outcome variables. The relationship between the independent variables in this study is not the interest of the investigator.

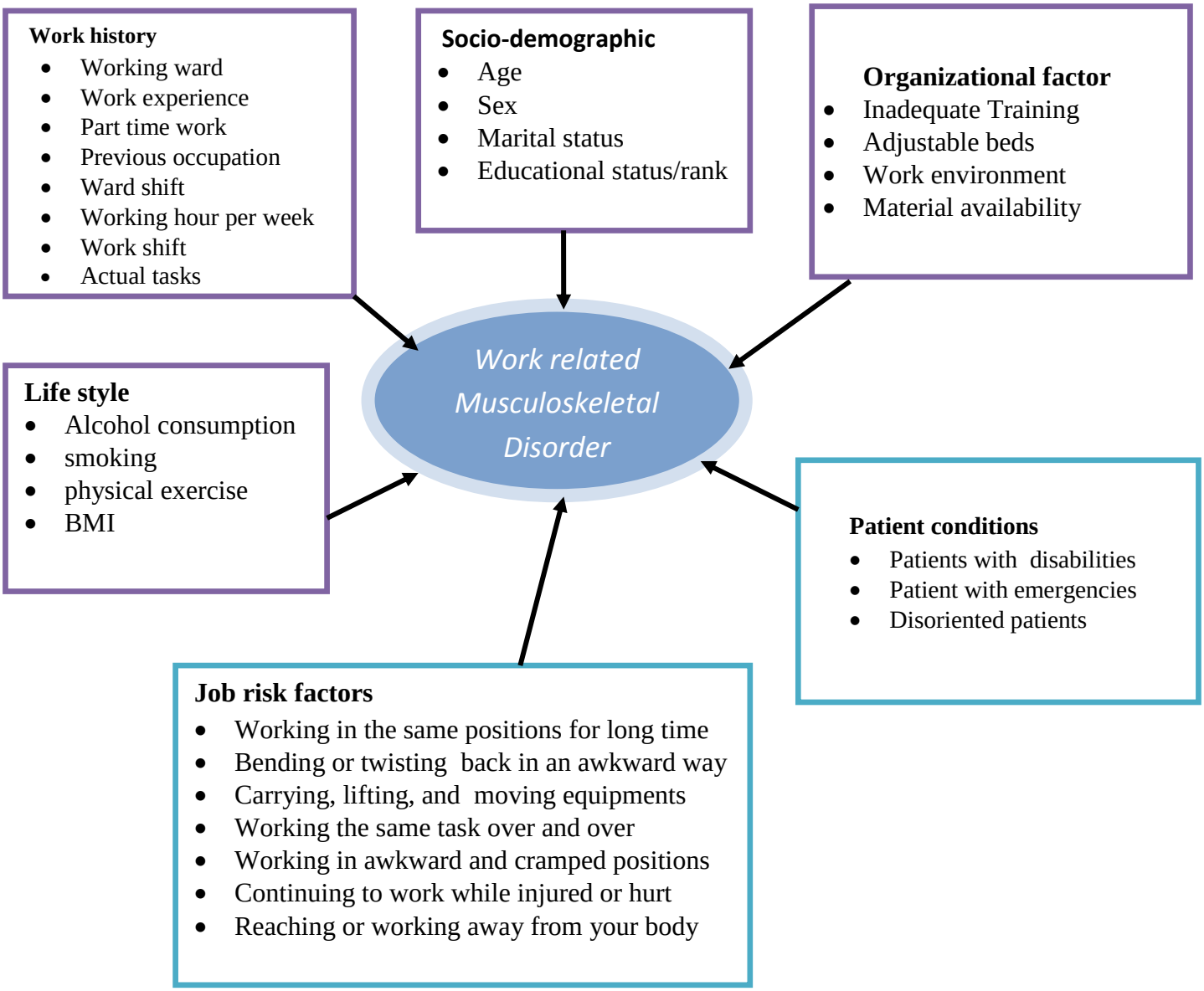


Fig1.Conceptual Frame work of work related musculoskeletal disorder and its associated factors among nurses working in Jimma zone public hospitals, south west Ethiopia, 2015.

## 2. 3.Significance of the Study

Since this study is the first of its kind in Ethiopia, the findings will provide insight for nurses, nurse managers and health care industry administrators to work on the identified factors leading WRMSD which will improve productivity and efficiency of nurses. This in turn boosts the achievement of the hospital. In addition, it helps for pre service on body mechanics and ergonomics training for nurse tutors. Furthermore, the result will be used as base line information for further research on work related musculoskeletal disorder

# CHAPTER THREE: OBJECTIVES

## 3.1. General Objective

- ✓ To assess work related musculoskeletal disorder and its associated factors among nurses working in Jimma zone public Hospitals, South west Ethiopia, 2015.

## 3.2. Specific Objectives

1. To determine prevalence of work related musculoskeletal disorders among nurses working in Jimma zone public Hospitals
2. To identify factors associated to work related musculoskeletal disorders among nurses working in Jimma zone public Hospitals

# CHAPTER FOUR: METHODS AND MATERIALS

## 4.1. Study area and Period

The study was conducted in four public hospitals in Jimma Zone, from March, 12-27, 2015. Jimma is one of the 18 zones of the Oromia Regional State. Jimma city is the capital of Jimma zone located at 352 Km to south west of Addis Ababa.

Based on the information from Jimma Zone and town Health Bureau, The population projection of 2014/15 of the zone is 3090112 and Jimma town is 184,925 respectively. The zone has a total area of 119,316 Square kilo meters.

In this zone there are four public hospitals (Jimma University Specialized hospital (JUTH), Shenen Gibe, Limu Genet and Agaro hospital) and one defense hospital. From the four public hospitals, the first two are situated in Jimma town where as the later two are at Limu town which is 72kms far from Jimma town and Agaro town which is 45km far from Jimma town respectively. Except JUTH, the three are district level. In addition to this the zones has 112 health centers and Jimma town administrative has 4 health centers.

There are 611 all types of nurses in Jimma zone public hospitals among which 518 of them are in JUSH, 32 in Shenen gibe, 27 in Agaro hospital and 34 in Limmu genet Hospital.

## 4.2. Study Design

Institutional based cross sectional study using both quantitative and qualitative data collection methods.

## 4.3 .Population

### 4.3.1. Source population

- All nurses who were working in Jimma Zone public Hospitals.

### 4.3.2 .Study population

- All nurses in Jimma Zone Public Hospitals available during data collection period

### 4.3.3. Inclusion and Exclusion Criteria

### 4.3.3.1. Inclusion Criteria

- All nurses working in the public hospital of Jimma zone during data collection period

### 4.3.3.2. Exclusion Criteria

- Nurses with work experience of less than 12 months.

## 4. 4. Sample Size and Sampling Technique

### 4.4.1. Sample Size

#### 4.4.1.1 Quantitative

The sample size was calculated using a single population proportion sample size calculation formula. Assumptions, d = margin of error of 4% with 95% confidence interval, α = 0.05 (level of significance), P=50% assumed the proportion of Work related musculoskeletal disorders.

$$\boldsymbol{n} = \left( \mathbf{Z}_{\frac{\alpha}{2}} \right)^2 \frac{\mathbf{p(1-p)}}{\mathbf{d}^2} = \frac{\mathbf{1.96*1.96*0.5*0.5}}{\mathbf{0.0016}} = 600.25$$

n = 600.25≈ 600

Since the number of nurses is 611(<10000), finite population correction formula was used as follows: $nf = \frac{n}{1+\frac{(n)}{N}} = \frac{600}{1+\frac{(600)}{611}} = 302.725 \approx 303$

Considering 10% non-response rate =303 *10%= 30.3

**nf** =303+30=**333**

**Finally =333 nurses were included in the study.**

#### 4.4.1.2 Qualitative

A total of ten nurses informants were participated in qualitative study.

### 4.4.2. Sampling Technique

#### 4.4.2.1 Quantitative data

Number of nurses obtained from respective hospital human resource department. Then proportional allocation to sample size was done to each hospital (282 nurses for JUSH, 17 nurses for Shenen gibe, 15 nurses for Agaro and 19 nurses for Limu genet). Then sampling frame was developed based on lists obtained from HR department and study unit was identified using systematic random sampling after calculating the $k^{th}$ value. The $k^{th}$ value was 2. The first nurse was selected based on lottery method and the subsequent study unit was selected with interval of two in the list of sampling frame. In case of absence nurses after two days of visit or not fulfilling inclusion and exclusion criteria the next or prior nurse was selected. The diagrammatic description of sampling frame depicted as follows.

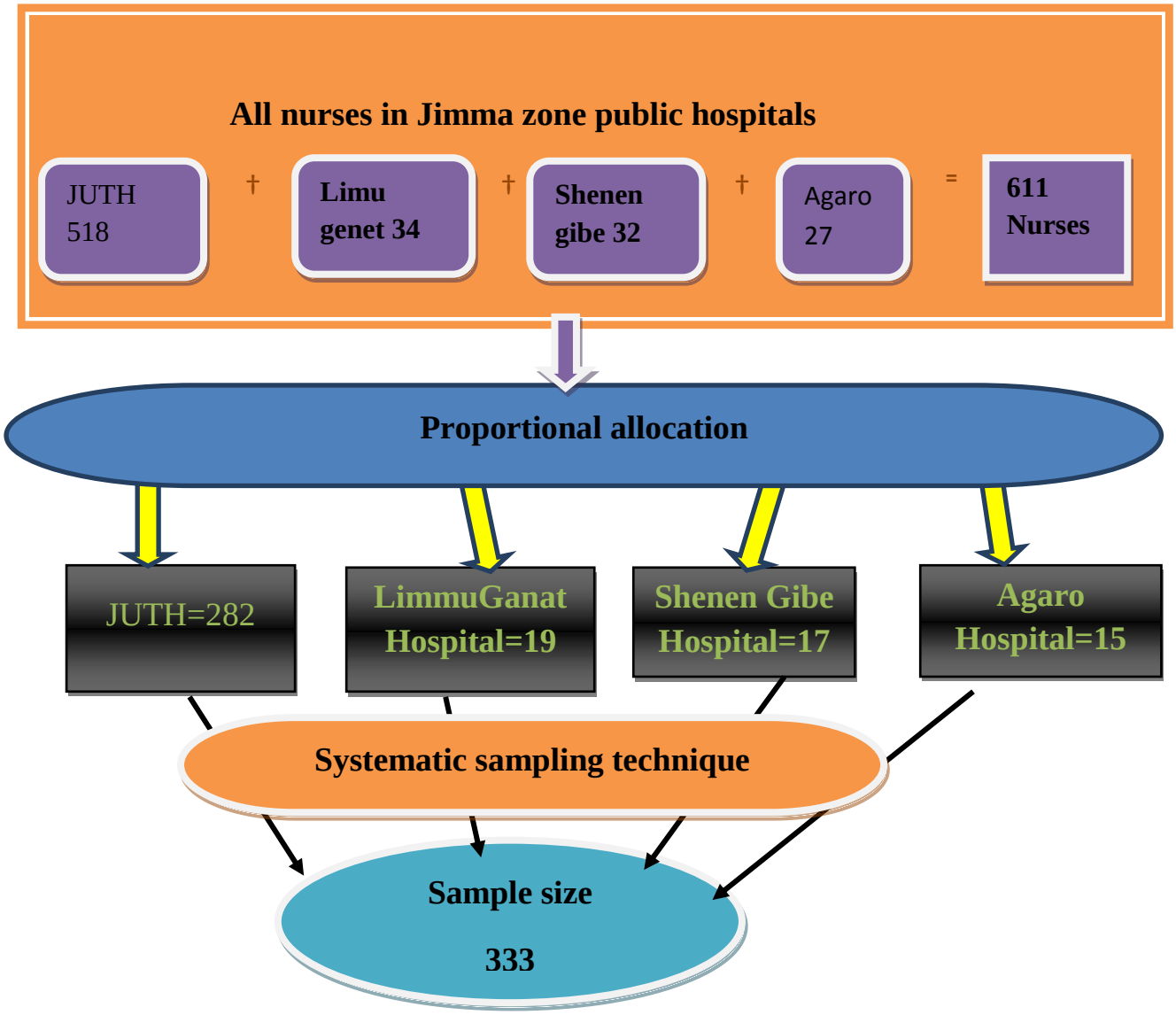


Figure2: Schematic presentation of sampling procedure

#### 4.4.2.2. Qualitative data

Qualitative informants were selected purposely. Criteria for selection were nurses who worked for at least in two major wards and as head nurse position for minimum of one year in the hospital. They were selected with assumption that staff nurses who will complain to them whenever they had WMSD and want to have rest from work and they may be experienced it when they were worked as staff nurse. The information was obtained from nursing director office of respective hospital.

## 4.5. Variables

### 4.5.1. Dependent variables

- Work related musculoskeletal disorder.

### 4.5.2. Independent variable

- **Socio-demographic Characteristics** (Age, sex, marital status, educational status/rank )
- **Work history** Working unit, work experience, previous job, Actual tasks, Work shifts ,number of hours per week ,part time work and ward shift)
- **life style** (Alcohol ,smoking , physical exercise and BMI)
- **Job risk factors**
  - ✓ Working in the same positions for long periods
  - ✓ Bending or twisting back
  - ✓ Carrying, lifting, and moving heavy materials or equipment
  - ✓ Working the same task over and over
  - ✓ Working in awkward and cramped positions
  - ✓ Continuing to work while injured or hurt
  - ✓ Reaching and working away from body

- **Organizational factor (** inadequate training on injury prevention, adjustable bed, work environment and material availability)

- **Patient conditions**
  - ✓ patients with disabilities
  - ✓ patient with emergencies
  - ✓ disoriented patients

## 4.6. Data collection procedures and quality control

### 4.6.1 Data Collection Instrument

Data collection instrument was adapted after review of relevant literatures (16, 18, 24, 25, and 28). Questionnaires were prepared in English and has semi- structured questionnaire open and closed ended questionnaire**.** The questionnaire arranged according to particular objective it address. It has six parts;

**Part I:** Socio- demographic characteristics

**Part II**: Work history and life style

**Part III:** prevalence of MSD

**Part IV**: Factors related to patient condition

**Part V**: factors elated to Organization**.**

**Part VI**: Job risk factor

In-depth interview guide was developed to collect qualitative data

### 4.6.2. Data collection procedure

Quantitative data was collected using self administered questionnaire. Questionnaire were distributed and collected back by data collection facilitators. Qualitative data was collected by in-depth interview and Voice recorders and field-notes were used to capture the information

### 4.6.3. Data Collection personnel.

Quantitative data collection facilitators were nurse selected from nearby health center based on their previous data collection experiences. A total of six Diploma Nurses; three for JUTH, one for Shenen Gibe, one for Limu Genet and one for Agaro and one supervisor were involved in data collection facilitation .One day data collection facilitation training was given on how to, identify subjects and distribute &collect back questionnaire. Qualitative data was collected by principal investigator.

### 4.6.4. Data quality control

Prior to the actual data collection, pre-testing was done on 5% of the total study subjects (17 nurses) at Bedele hospital. Wording, organization and structuring of the questionnaire were

checked and amended accordingly. Data collection facilitator and supervisor were trained for one day intensively. Daily close supervision was done by supervisor and each filled questionnaire was checked daily. Finally, the data was carefully entered and cleaned before the beginning of the analysis.

## 4.7. Operational Definition

**Work-related musculoskeletal disorder**

- In this study WMSD refers to self reported pain or discomfort at least once in the last one year after work or following work by nurses in one or more of the following body regions : Low back ,Neck ,Knees ,Upper back ,Wrists/Hands ,Shoulder, Ankles/Feet ,Elbow and Hips/Thighs.

**Work Load**

In this study those nurses who worked for greater than 40 hours per week considered over loaded and otherwise not.

**Previous job or occupation:** jobs before nursing.

**Conducive work environment-** the working unit that is comfortable for work during nursing activities in terms of work space/ over crowdedness of beds and structure.

## 4.8. Data entry and analysis procedures

The data was entered into Epi-Data version 3.1 for cleaning and to check for completeness and missing values and then exported to SPSS version 21.0 for analysis. Percentage, Frequency, mean and standard deviation was calculated. Odds ratio with 95 % confidence interval was used to examine associations between dependent & independent variables. Those variables with P-value <0.25 in bi-variable analysis were included in multivariable analysis Moreover; logistic regression analysis was done to see the association between the predictor and the outcome variable (WMSD). The P. value less than 0.05 was considered significant. Results were summarized and presented by tables, and charts. The qualitative data were transcribed and presented in narratives & triangulated with quantitative results

## 4.9. Ethical Consideration

The study was not involved any experiment on human subjects. Ethical clearance and approval letter to conduct study was obtained from JU CPHMS, Institutional Review Board

to communicate with Hospitals administrative body in Jimma zone. Permission letter was obtained from administrative body of each hospital. The study has no risk and exceptional benefits. Finally after ensuring that the study has no risk and informing its benefit, verbal consent was obtained from the subjects included in the study immediately before the distribution of questionnaire. The right of the respondents to refuse answer for few or all of the questions was respected.

## 4.10 .Dissemination Plan

The final report will be disseminated to the Department of nursing, College of health sciences, Jimma University. Again the study findings will be disseminated to the Jimma University Specialized Hospital, Limu Genet hospital, Shinen Gibe hospital, Agaro hospital, Jimma zone health Bureau, and other relevant bodies, after the completion of the academic process at Jimma University. Attempts will be made to publish the findings in peer reviewed and scientific journals.

# CHAPTER FIVE: RESULTS

## 5.1 Characteristics of the Study Participants

Three hundred thirty three questionnaires distributed and 301nurses returned questionnaires which makes response rate of 90.3%. The reason for non response rate was refusal and work load to fill the questionnaire. Among the total study participants, majority 253(84.1%) were working at JUTH, 168(89%) were in the age group 20-29 years, 159(52.8%) were males, 180(59.8%) single, 172(57.1%) were Oromo. Regarding the educational status 178(59.1%) were Diploma Nurses and their mean salary was 2402.2±871.7EB (**Table 1**).

**Table 1** Socio-Demographic Characteristics of nurses working in Jimma Zone public Hospitals, South West of Ethiopia March, 2015.

| | | Frequency(n=301) | % |
|---|---|---|---|
| Sex | Male | 159 | 52.8 |
| | Female | 142 | 47.2 |
| Age | 20-29 | 268 | 89.0 |
| | 30-39 | 16 | 5.3 |
| | >40 | 17 | 5.6 |
| Marital status | Married | 119 | 39.5 |
| | Single | 180 | 59.8 |
| | Divorced | 2 | 0.7 |
| Educational Qualification | Diploma in Nursing | 178 | 59.1 |
| | Bachelor degree in Nursing | 120 | 39.9 |
| | Masters degree in Nursing | 3 | 1.0 |
| Ethnicity | Oromo | 172 | 57.1 |
| | Amhara | 74 | 24.6 |
| | Gurage | 17 | 5.6 |
| | Tigire | 9 | 3.0 |
| | Dawro | 6 | 2.0 |
| | Other | 23 | 7.6 |
| Salary | <1800 | 79 | 26.2 |
| | 1800-2350 | 78 | 25.9 |
| | >2350 | 144 | 47.8 |
| Organization | JUSH | 253 | 84.1 |
| | Shenen Gibe | 16 | 5.3 |
| | Limu Genet | 17 | 5.6 |
| | Agaro | 15 | 5.0 |

## 5.2 Prevalence of work-related musculoskeletal disorders

From the 301 respondents 183(60.8%) experienced WMSD at least in one body region during the last 12 months. The highest 12-months prevalence of WMSDs was reported in the low back (67.8%), followed by the neck (24.0%) and knees (23.6%), but least in the Elbow /forearm (2.7%) (Table 2). Majority of qualitative informants also reported existence of work related musculoskeletal or discomfort following nursing action at anybody region. For example o*ne 34 years old informant from JUTH said, '' many nurses complain pain on back and legs following work". One of his work compatriot on the other hand said "I myself experienced back and leg pain after work and prefer to lie on supine position elevating my legs. Friend of mine in ICU also complains similar problem and planning to change the unit".*

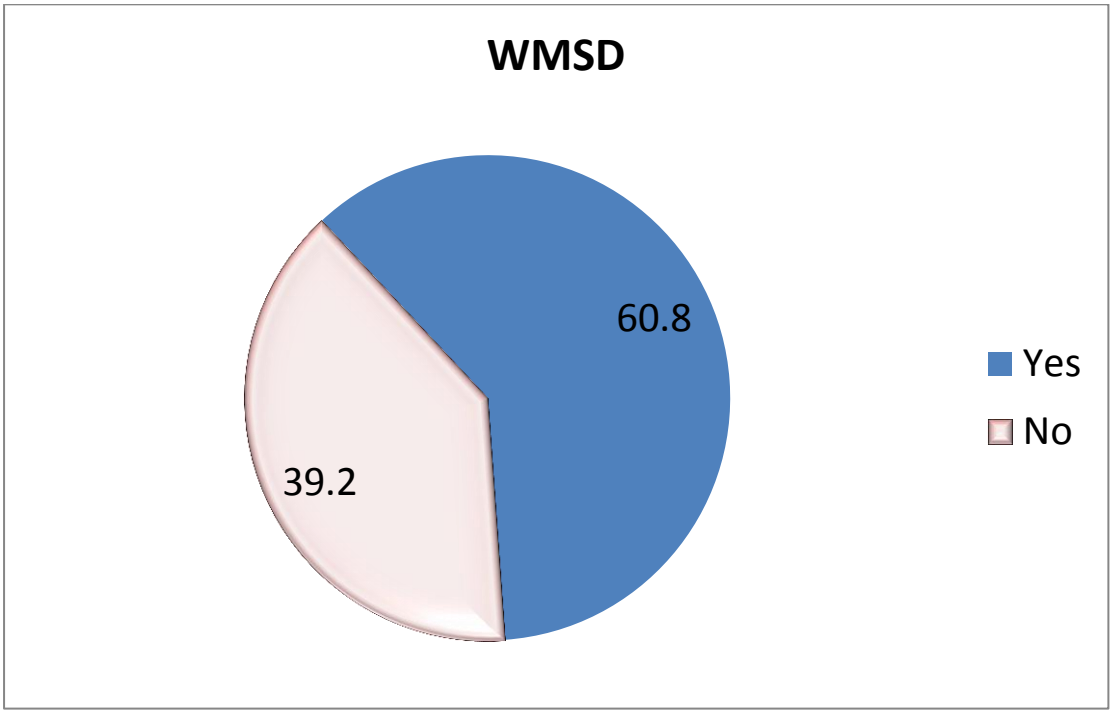


Figure 3: Prevalence of work related Musculo Skeletal Disorder among Nurses in Jimma Zone Public Hospitals.

**Table 2. Body region and work related musculoskeletal disorders among nursing professionals working in Jimma Zone public Hospitals, Murch,2015**

| Body region | Frequency(n=183) | Percentage (%) |
|---|---|---|
| Low back | 124 | 67.8 |
| Neck | 44 | 24.0 |
| Knees | 43 | 23.6 |
| Ankles/Feet | 36 | 19.7 |
| Hips/Thighs | 29 | 15.8 |
| Upper back | 28 | 15.3 |
| Shoulder | 26 | 14.1 |
| Wrist/hand | 13 | 7.1 |
| Elbow /forearm | 5 | 2.7 |

Of all the 183 respondents that indicated WMSDs 76(41.5%) reported that they had treated themselves or had sought treatment from other health practitioners for WMSDs and 26.2% reported that they have changed their working unit due to WMSD. Highest percentage of the respondents (67.4%) experienced their first episode of WMSDs in the first five year of clinical practice, and 14.9% during 5-15 years of nursing practice.

## 5.3 Work History

Concerning Working Unit, the top 5 were surgical ward, OPD, OR, Medical and pediatrics ward account for 21.9%, 11.3%, 11.0%, 10.6% and 10% respectively. Majority (90%) of the respondents were staff nurses in position while 78.1% had 1-5 years of experience. Two hundred thirty two (77.1%) had no previous occupation and only 38(12.6%) of them had part time job or they had done extra-shifts at another clinic/hospital outside their normal shift. The mean number of hours per week they had done was 52.29 ± 12.95.Majority 190(63.1%) of the respondents worked in mixed (day and night) shift (**Table 3).**

**Table 3: Work History of Nursing Professionals of Jimma zone public Hospitals**, South West of Ethiopia, March, 2015.

| Work related characteristics | | Frequency(n=301) | % |
|---|---|---|---|
| **Working Unit/department** | Medical ward | 32 | 10.6 |
| | Surgical Ward | 66 | 21.9 |
| | Pediatrics ward | 30 | 10.0 |
| | Neonatology ward | 9 | 3.0 |
| | ICU | 16 | 5.3 |
| | OR | 33 | 11.0 |
| | Recovery room | 2 | 0.7 |
| | OPD | 34 | 11.3 |
| | Psychiatry | 9 | 3.0 |
| | Ophthalmology | 6 | 2.0 |
| | Obey/gyne ward | 15 | 5.0 |
| | chronic illness | 5 | 1.7 |
| | TB and ART clinic | 9 | 3.0 |
| | MCH | 8 | 2.7 |
| | Dental clinic | 10 | 3.3 |
| | Other* | 16 | 5.3 |
| **Work Experience in Nursing** | 1-5 | 235 | 78.1 |
| | 6-10 | 45 | 15.0 |
| | 11-15 | 3 | 1.0 |
| | >16 | 18 | 6.0 |
| **position** | staff nurse | 271 | 90.0 |
| | Head nurse | 24 | 8.0 |
| | Supervisor | 2 | 0.7 |
| | Matron | 2 | 0.7 |
| **previous occupation** | No | 232 | 77.1 |
| | Yes | 69 | 22.9 |
| **part time job** | No | 263 | 87.4 |
| | Yes | 38 | 12.6 |
| **work schedule (shift)** | Day | 89 | 29.6 |
| | Night | 22 | 7.3 |
| | Mixed | 190 | 63.1 |
| **work shift** | Constant | 66 | 21.9 |
| | Rotational | 235 | 78.1 |

***Other-**admission office, supervision, nursing director office and matron, referral clinic

## 5.4 Life style

Regarding life style, 282(93.7%) never smoked and 226(75.1%) never drunk. Out of 301 respondents 137(45.5%) were engaged in different type of physical exercises, 277( 92%) were non-obese (<25kg/$m^2$).

**Table 4 Life styles of Nursing Professionals of Jimma zone public Hospitals, South West of Ethiopia March, 2015.**

| variables | | frequency (n=301) | % |
|---|---|---|---|
| **Body mass index** | <25(non-obese) | 277 | 92.0 |
| | >=25(obese) | 24 | 8.0 |
| **Smoking habit** | never smoked | 282 | 93.7 |
| | yes, I did in the past | 12 | 4.0 |
| | yes, I'm smoking now days | 7 | 2.3 |
| **Alcohol taking** | never drunk | 226 | 75.1 |
| | yes, occasionally | 70 | 23.3 |
| | yes, regularly | 5 | 1.7 |
| **physical exercises** | No | 164 | 54.5 |
| | Yes | 137 | 45.5 |

## 5.5 Actual Activities

With regard to daily actual nursing activities, majority 174(57.8) of nurses reported Lifting or transferring dependent patients, Bed-making 127(42.2%) and Wound dressing 122(40.5%) related with WMSD (**table 5**). This also substantiated with qualitative results. For example 24yrs old female nurse said "*….always I feel pain on my back, shoulder and legs after wound care especially extensive burn wound, taking &receiving patients from operation theater, transferring patient from &to stretcher, rolling oxygen cylinder …..*"

**Table5 Actual tasks of nursing professionals of Jimma Zone Public Hospitals, South West of Ethiopia March, 2015.**

| | **n** | **%** |
|---|---|---|
| **Lifting and transferring dependent patients** | 174 | 57.8 |
| **Bed-making** | 127 | 42.2 |
| **taking patients vital signs** | 70 | 23.3 |
| **Wound dressing** | 122 | 40.5 |
| **Administering medication** | 62 | 20.6 |
| **Bed bath** | 66 | 21.9 |
| **Performing manual orthopedic techniques** | 40 | 13.3 |
| **Writing reports** | 17 | 5.6 |

## 5.6 Organizational related Variables

Majority of the respondents 74.4% reported that no available materials especially for patient handling and 71.1% indicated that the working environment is not conducive. The qualitative data also substantiates the above finding.

*A 27 years old male participant said, ''the ward is not conducive for work especially the bed is overcrowded which makes us work in uncomfortable posture''.*

Majority (77.1%) of the respondents reported no training on manual handling or ergonomics (how to prevent occupational hazards).

**Table 6** Organizational characteristics of nursing professionals of Jimma zone public hospitals, South West of Ethiopia, March, 2015.

| Organizational characteristics | | n | % |
|---|---|---|---|
| **beds height-adjustable** | All of them | 78 | 25.9 |
| | Very few | 119 | 39.5 |
| | None | 104 | 34.6 |
| **availability of materials** | No | 224 | 74.4 |
| | Yes | 77 | 25.6 |
| **using work equipment** | Always | 23 | 29.9 |
| | Some times | 29 | 37.7 |
| | Rarely | 12 | 15.6 |
| | Not at all | 13 | 16.9 |
| **conducive working environment** | No | 214 | 71.1 |
| | Yes | 87 | 28.9 |
| **training on manual handling or ergonomics** | No | 232 | 77.1 |
| | Yes | 69 | 22.9 |

## 5.7 patient condition related variables

Majority of the respondents reported that they work all the time patients with disabilities (62.8%), patient with emergencies (54.5%), and work with disoriented patients (50.2%).

**Table 7: Patient condition of nursing professionals of Jimma Zone Public Hospitals, South West of Ethiopia , March, 2015.**

| Pt condition | All the time In % | Most of the time In % | Some of the time In % | A little of the time In % | None of the time In % |
|---|---|---|---|---|---|
| **Patient with disabilities** | 62.8 | 27.2 | 6.6 | 1.7 | 1.7 |
| **patient with emergencies** | 54.5 | 23.9 | 13.6 | 1.7 | 6.3 |
| **disoriented patients** | 50.2 | 27.2 | 17.6 | 3.7 | 1.3 |

## 5.8 Respondents' problem perception on Job risk /condition at work

Table 8 shows the responses of the respondents, how much of problem job tasks/conditions were to the respondents. Majority of the respondents reported major problems in Carrying, lifting, and moving heavy materials or equipments (68.4%), working in the same positions for long period (44.9), Bending or twisting back in work place (63.5) and Working in awkward and cramped position (62.1).This finding is also supported by the qualitative study.

*"-----many staffs complained long standing specially when I was working in OR most of the time the procedure is done by resident physician who are not fast so we stand for long time and also we enforced to use poor working posture since the working environment is poor and overcrowded, no material to move and lift pts this all may put the staff on this problem....."(26/male). One other interviewee added "…..we push and pull bed and also transport the oxygen cylinder from ward to ward..." (27/male).*

Table 8; Respondents' problem perception on Job risk /condition at work/ for nurses working in Jimma zone public hospitals, South West of Ethiopia March, 2015. N=301

| Job risk | no problem in % | Minimal to moderate problem in % | major problems in % |
|---|---|---|---|
| **Carrying, lifting, or moving heavy materials or equipments** | 6.3 | 25.2 | 68.4 |
| **Working in the same positions for long period** | 7.3 | 24.9 | 67.8 |
| **Working in awkward and cramped position** | 12.3 | 26.2 | 61.5 |
| **Bending or twisting back** | 12.0 | 24.6 | 63.5 |
| **Performing the same task over and over** | 24.9 | 39.5 | 37.5 |
| **Reaching or working away from your body** | 24.9 | 42.9 | 32.2 |
| **Continuing to work while injured or hurt** | 22.9 | 39.2 | 37.9 |

## 5.9 Factors associated with WMSD among nurses in Jimma Zone Public Hospitals.

Lifting or transferring dependent patients, Wound care, working unit, working in the same positions for long period, working in awkward and cramped position, caring of disoriented patients and bending or twisting back were factor significantly associated with WMSD among nurses. Nurses those who lift and move patients in their daily activity were 2.1 times more likely to have WMSD as compared to those who didn't lift or move patients with 95%CI of 1.1-4.3.Nurses those who gave wound care in their daily activity were 4.2 times more likely to have WMSD as compared to those who didn't with 95%CI of 1.9-8.9. Nurses those worked in medical ward and theatre/ICU were 9.6 and 3.4 times more likely at risk for developing work related musculoskeletal disorders with 95% CI 2.4-38.3 and 1.2-9.7 as compared to those worked in outpatient departments respectively. Nurses who perceived job risks like awkward and cramped position and working in the same position as a problem were 9.7 and 6.1 time more likely to have WMSD as compared to those who didn't perceived as a problem with 95% CI 2.2-42.6 and 1.3-28.7respectively, while those perceived Bending or twisting back as a problem during work 5.1 time more likely to have WMSD as compared to those who didn't perceived it with 95% CI 1.1-23.7. Nurses who worked all the times with disoriented patients were 2.6 times more likely at risk to develop WMSD with 95% CI 1.1-5.7 than those worked sometimes with such patients (Table 9).

Table 9 A multivariable logistic regression analyses of the various risk factors for reported WMSD among Nurses Working in Jimma Zone Public Hospitals, South West Ethiopia, March, 2015.

| Variable | category | WMSD | | COR(95%CI) | AOR(95%CI) |
|---|---|---|---|---|---|
| | | **YES** | **NO** | | |
| **Sex** | male | 106(66.7) | 53(33.3) | 1 | 1 |
| | female | 77(54.2) | 65(45.8) | 0.6(0.4-0.9*) | 0.9(0.5-1.8) |
| **Marital status** | single | 117 (65.0) | 63(35.0) | 1 | 1 |
| | married | 66 (54.5) | 55(45.5) | 0.6 (0.4-1.0) | 0.6(0.3-1.2) |
| **Pervious occupation** | no | 134(57.8) | 98 (42.2) | 1 | 1 |
| | yes | 49 (71) | 20(29) | 1.7(1.0-3.1) | 1.9(0.8-4.3) |
| **Part time work** | no | 153(58.2) | 110(41.8) | 1 | 1 |
| | yes | 30 (78.9) | 8 (21.1) | 2.7(1.2-6.1*****) | 1.2(0.4-3.6) |
| **Physical exercise** | no | 90(54.9) | 74(45.1) | 1 | 1 |
| | yes | 93(67.9) | 44 (32.1) | 1.7(1.1-2.8*****) | 0.9(0.5-1.9) |
| **Lifting or transferring dependent patients** | no | 82(47.1) | 92(52.9) | 1 | 1 |
| | yes | 101(79.5) | 26(20.5 | 4.4(2.6-7.4) | **2.1(1.1-4.3*)** |
| **Wound dressing** | no | 86 (48.0) | 93 (52.0) | 1 | 1 |
| | yes | 97(79.5) | 25(20.5) | 4.2(2.5-7.1******) | **4.2(1.9-8.9**)** |
| **Bed bath** | no | 147 (62.6) | 88 (37.4) | 1 | 1 |
| | yes | 36 (54.5) | 30 (45.5) | 0.7(0.4-1.2) | 0.8(0.3-1.7) |
| **Manual orthopedic technique** | no | 164 (62.8) | 97 (37.2) | 1 | 1 |
| | yes | 19 (47.5) | 21(52.5) | 0.5(0.3-1.0) | 0.6(0.2-1.4) |
| **Working unit** | Outpatient dep't | 40(48.8) | 42(51.2) | 1 | **1** |
| | Medical | 25 (75.8) | 8 (24.2) | 3.3(1.3-8.1) | **9.6(2.4-38.3**)** |
| | surgical | 41(62.1) | 25(37.9) | 1.7(0.9-3.3) | 1.1(0.5-2.6) |
| | pediatrics | 23(59.0) | 16(41.0) | 1.5(0.7-3.3) | 1.4(0.5-4.1) |
| | OR/ICU | 35(68.6) | 16(31.4) | 2.3(1.1-4.8) | **3.4 (1.2-9.7*)** |
| | Other inpatient | 19(63.3) | 11(36.7) | 1.8(0.8-4.3) | 1.2 (0.4-3.6) |
| **Working in the same positions for long period** | No problem | 4(18.2) | 18(81.8) | 1 | 1 |
| | problem | 179(64.2) | 100(35.8) | 8.0 (2.6-24.5******) | **6.1(1.3-28.7*)** |
| **Working in awkward and cramped position** | No problem | 3(8.1) | 34(91.9) | 1 | 1 |
| | problem | 180 (68.2) | 84 (31.8 | .6(4.3-31.0******) | **9.7 (2.2-42.6*)** |
| **Performing the same task over and over** | No problem | 30(43.5) | 39(56.5) | 1 | 1 |
| | problem | 153(65.9) | 79(34.1) | 2.5(1.5-4.3*****) | 1.5(0.6-3.7) |
| **Working with confused or agitated patients** | All the time | 105(69.5) | 46(30.5) | 3.9(2.1-7.2******) | **2.6(1.1-5.7*)** |
| | Most of the time | 53(64.6) | 29(35.4) | 3.1(1.6-6.1) | 2.3(0.9-5.6) |
| | Some or less time | 25(36.8) | 43(63.2) | 1 | 1 |
| **Bending or twisting back** | No problem | 5(13.9) | 31(86.1) | 1 | 1 |
| | problem | 178(67.2) | 87(32.8) | 9.3(4.0-22.0******) | **5.1(1.1-23.7*)** |
| **Ward shift** | Constant | 33(50.0) | 33(50.0) | 0.6(0.3-1.0) | 0.6(0.3-1.4) |
| | Rotational | 150(63.8) | 85(36.2) | 1 | 1 |

**Table continued**

| | | | | | |
|---|---|---|---|---|---|
| **Number of hour per week** | <40hr/wk | 26(48.1) | 28(51.9) | 1 | 1 |
| | >40hr/wk | 157(63.6) | 90(36.4) | 1.9(1.0-3.4) | 0.9(0.4-2.1) |
| **Reaching or working away from your body** | No problem | 35(46.7) | 40(53.3) | 1 | 1 |
| | problem | 148(65.5) | 78(34.5) | 2.2(1.3-3.7*****) | 0. 8(0.3-1.8) |

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***=statistically significant (p<0.05)**

****= Statistically highly significant (P<0.001)**

# CHAPTER SIX: DISCUSSION

The prevalence of WMSDs at anybody region in this study was 60.8% which indicates significant number of nurses working in Jimma zone public hospitals were experienced work related musculoskeletal disorder in last one year. This might decreases nurse's productivity, efficiency and effectiveness during their working hours as most nurses might spend on sick leave days in these public hospitals. If appropriate measures not taken, in long term time this might leads to sever threat to nurse's work force in public hospitals as they might leave the job. The prevalence of WMSDs among nurses varied according to studies. For instance higher prevalence of WMSD among nurses in mainland China 70% (22), rural Malaysia 73.24% (16) , Nigeria 78%**(**17**)** and Uganda 80.8%(18). This difference might be attributed to work setting organizational differences, differences in the perception on reporting of pain and discomfort ,sample size difference, the study population is vary in sex (females are dominant in prior studies). However, the current flinging is relatively comparable with to report from Netherlands (57%) by Engels A J et.al (23).

The highest prevalence of 12 months period WMSDs in nurses according to body sites in this study was the low back (67.8%), followed by the neck (24.0%) and then knees (23.6%). This distribution pattern is consistent with literature. Many studies indicates Law back pain is the most common MSD (13, 17, 18, 20, 22, 24).The LBP in this study (67.8%) is similar with the study conducted in Iran (66.1%) (13), but slightly higher than the study in Uganda (61.9%) **(**18**)** .The prevalence of neck and knee region in this study was comparable with the study in Nigeria (17).

Work-related musculoskeletal injuries have negatively impact on employees' quality of life, health and patient care and also consequences of musculoskeletal injuries include job change, job loss, and chronic pain (29). MSDs are preventable by educating the staffs about the use of proper body mechanics and modifying the work environment. Adjust the height of working surfaces to reduce long reaches and awkward postures, Reduce the weight and size of items that workers must lift and Provide mechanical lifting equipment are the recommendations made by OSHA (2000) to prevent MSDs (30).

In this study some risk factors of WMSD were identified. Perceived job risk factors like working in awkward posture, working in the same position for long time and bending or twisting the back were among the identified. This shows that the nurses used improper work posture during their nursing activities. This is similar with the study in Iran (20) and India

(24). The study conducted in Nigeria (17) also indicated that working in the same position for prolonged time is associated with WMSD and the study in Brazil by Foncica(10) shows poor posture of the back during work is associated predictors for WMD. The nursing activities like lifting and transferring dependent patients and giving wound care were also the identified risks. Similarly the study conducted in Nigeria (17) and India (24) indicated lifting and transferring dependent patients was significantly associated factor with WMSD. This all are not surprising because of poorly equipped hospitals in the low income countries as they use patient manual handling and shortage of staffs; while in high income countries nurses use mechanical lifting equipment like sliding sheets, lifting hoists, and slings, etc for patient handling (26, 30-32). A reason for this was found in the response of the nurses when 74.4% of the nurses stated that there is not available material for patient handling and only (29.9%) of respondents had used work equipment always during their nursing activities. This means that they had been manually handling patients (e.g. lifting patients from and to bed, turning patients side to side, repositioning patients, etc.). Majority (71.1%) of respondents in this study also reported that their working environment is not conducive which can be the reason for affecting the working posture, working for long time in the same position. Giving care for patients with wound may also take long time and affects the work posture depending on condition of working environment and type of wounds that can put nurses on risk.

In this study the work unit was also identified as a risk for WMSD; medical ward and theatre/ICU were significant adjusting with all other variables, which is similar with the study conducted on LBP in Nigeria (26) .This is might be due to nursing activities, patient condition and the nature of works may vary in work units. Dependent patients (e.g. unconscious patients in coma, patients with neurologic disorders, patients on complete bed rest, etc.) who cannot assist or move themselves or require the nurses to care for them totally are admitted in the medical ward which put the nurses more at risk. Factors, like bending, lifting and transferring, bed bathing, bed-confined patients, etc. could be possible reasons why risk is high in the medical units. Also in theatre ward nurses may stand for long period and close monitoring and working with critically ill patients in Intensive care unit may put nurses on risk. Working with disoriented patient was also identified as a risk in this study. This is obvious that such patients are not co-operating with nurses during giving care. This is inconsistent with the study in Nigeria (17).This is might be due to difference in sample size and number of staff nurses assigned working unit.

As any other cross-section study, this study has strength and weakness .The strong side of this study is the fact that it is the first of its kind to reveal self reported WMSDs among nurses in Ethiopia in general and in Jimma zone in particular. It also used mixed data collection method. However; nurse may under report or may exaggerate the pain and discomfort following nursing activity. On the other hand, it is very difficult to know whether or not the reported MSD is totally following nursing actions. Furthermore, the users of this research output are cautioned on interpretations of some variables with wide confidence intervals.

**CONCLUSION**

The prevalence of WMSDs at anybody region in this study is 60.8% which indicates significant number of nurses working in Jimma zone public hospitals are experiencing work related musculoskeletal disorder in last one year.

Lifting or transferring dependent patients, Wound care, working unit, working in the same positions for long period, working in awkward and cramped position, caring of disoriented patients and bending or twisting back are factors independently significantly associated with WMSD among nurses.

**RECOMMONDATION**.

- Nurses in Jimma zone public hospitals should follow the principles of body mechanics during lifting and transferring patients to prevent injuries.
- Hospitals should create conducive working environments to reduce the awkward posture during work and should give attention to in-service training about Safe manual patient handling techniques or ergonomics (how to prevent occupational hazards) as the majority of the respondents of this study reported no training on this issues.
- Since the nursing activities and condition vary in wards, the working unit where long standing, dependent patients, and non-natural working posture are common should have reasonable nurse to patient ratio in order to reduce these risks of work related musculoskeletal disorder

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# ANNEXES

## Annex I

## Letter of Information about the Study

Dear Nurses!

I am Msc student in the school of graduate studies of Jimma University in department of Nursing. I am conducting this study in partial fulfillment of the requirements for the Degree of Masters in Adult Health Nursing. My proposal has been approved by the Institution Review Board JUCPHMS . I have also received ethical approval from the University to conduct this study. Dear my participant, I would be grateful if you would participate in this study by completing this questionnaire. It is hoped that the findings of this study would help both the nursing management and staff as to be more aware of the factors that affects work related musculoskeletal disorder in nursing profession.

Be assured that the **information you provide** would be used for research purposes only and would be treated as **confidential** and **participation is completely voluntary.**

## Consent form

I have read the information on the title and aim of the study given above. The title and aim of the study was clear to me. I understood that participation in this study is completely voluntary and that if I want to withdraw from the study any time, I will not obliged to continue and I will withdraw from it at any time. I understand that there is no risk associated with participating in this study. So, I agree to this. Hereby I can give informed consent to participate to this study.

Name of unit you are working now _____

Signature of volunteer _____ Date _____

**Principal Investigator:** **Tilahun Mekonnen**

**Tel: No** **09-13-65-57-72**

**Email:** tilahunmekonnen69@yahoo.com

## Thank You for your cooperation

# Annex II. Questionnaire

**Jimma University**

**College of Health Sciences**

**Department of Nursing**

The following Questionnaires are used to assess self **reported work related musculoskeletal disorder among nurses working Jimma zone public Hospitals**. The questionnaire has six parts please read all instruction at each part to choose and fill your answer.

**Part I: Socio-Demographic information for nurses**

**Instruction:** Please thick (✓) the number in front of the option you choose & fill in the blank space that best describe you on the right side of the table.

| **S. N<u>o</u>** | **Items** | **Coding categories** | **skip** |
|---|---|---|---|
| 100 | Your sex | 1. Male<br>2. Female | |
| 101 | Your Age in years | _____year | |
| 102 | Marital status | 1. Married<br>2. Single<br>3. Divorced<br>4. Widowed | |
| 103 | Ethnicity | 1. Oromo<br>2. Amhara<br>3. Gurage<br>4. Dawro<br>5. Other(specify) _____ | |
| 104 | Level of Education | 1. Diploma in nursing<br>2. Bachelor degree in nursing<br>3. Masters degree in nursing<br>4. Other(specify)_____ | |
| 105 | Your weight in kg | _____kg | |
| 106 | Your Height in meter | _____cm | |
| 107 | Specify your current organization (hospital). | 1. JUSH<br>2. Shenen Gibe<br>3. Limmu Genet<br>4. Agaro hospital | |
| 108 | Your Monthly income in birr | _____birr | |

**Part II. Work history and life style**

| S. No | Questions | Response | |
|---|---|---|---|
| 201 | Years of experience in the field of nursing | _____year | |
| 202 | indicate the number of hours per **week** you spend in hospital for work including over time | _____hour/week | |
| 203 | Had you have **previous occupation** before employed as a nurse? | 1. Yes 0. No | |
| 204 | What is your current working unit/ward? | 1. Medical ward<br>2. Surgical ward<br>3. Pediatrics ward<br>4. Neonatology<br>5. ICU<br>6. OR<br>7. Recovery room<br>8. OPD<br>9. Psychiatry<br>10. Ophthalmology<br>11. Oby/Gyn ward<br>12. Chronic illness<br>13. TB & ART clinic<br>14. Other (specify)----- | |
| 205 | Your position(Responsibility) that you presently hold within the hospital | 1. Staff nurse<br>2. Head nurse<br>3. Supervisor<br>4. Matron | |
| 206 | How many months have you spent in your current ward/unit? | _____month | |
| 207 | Do you have other job (paid or unpaid) OR Do you do overtime or extra-shifts at another clinic/hospital outside your normal shift? | 1. Yes 0. No | |
| 208 | When is your work schedule (shift)? | 1. day<br>2. Night<br>3. mixed | |
| 209 | How do you describe work shift (working ward/unit) | 1. Constant<br>2. rotational | |
| 210 | Do you have smoking habit? | 1. never smoked<br>2. yes, I did in the past<br>3. yes, I'm smoking now day | |
| 211 | Do you take alcohol? | 1. I never drunk<br>2. yes, occasionally<br>3. yes, regularly | |
| 212 | Did you do physical exercises during the past 12 months? | 1. Yes 0. No | *If No, go to Que. no 301* |

**Part III- prevalence of musculoskeletal disorder**

The following questions will assess the prevalence of musculoskeletal disorders of different body areas like Neck, Wrist/hand, Shoulder, Hips/Thighs, Upper back (thoracic), Knees, Low back, Ankles, and Elbow/forearm

| S. No | Questions | Response | Skip |
|---|---|---|---|
| 301 | Have you **ever experienced** work related trouble (ache, pain, discomfort**) in the last one year (last 12 months)**? | 1. Yes<br>0. No | If **No**, go to Que. No309 |
| 302 | If you said **Yes** question number **301,** on which part of your body you have **experienced** work-related ache, pain, and discomfort**?**<br>**(N.B: More than two answers are possible).** | 1. Neck<br>2. Shoulder<br>3. Upper back (thoracic)<br>4. Low back<br>5. Elbow/forearm<br>6. Wrist/hand<br>7. Hips/Thighs<br>8. Knees<br>9. Ankles | |
| 303 | When did you first experience work-related musculoskeletal problem like? | 1. Before being a nurse<br>2. First 5 years as a registered nurse<br>3. 5-15 years after as a registered nurse<br>4. >15 years after as a registered nurse<br>5. I don't know | |
| 304 | How do you explain the severity of these complains? | 1. mild<br>2. moderate<br>3. severe | |
| 305 | Have you ever treated yourself or sought treatment from any health professional as a result of work-related problem? | 1. Yes<br>0. No | |
| 306 | Have you ever been on sick leave due to work- related problem? | 1. Yes 0. No | |
| 307 | How many days were you on sick leave in **the past 12 months** due to work related musculoskeletal trouble? | 1. None<br>2. 1-7 days<br>3. 8-14 days<br>4. 15-28 days<br>5. 1-3 months<br>6. Greater than 3 months<br>7. I don't know | |
| 308 | Have you ever changed the **working unit (ward)** as a result of work-related problem? | 1. Yes<br>0. No | |

| | | | |
|---|---|---|---|
| 309 | Indicate the nursing procedure that **you think usually** strains your musculoskeletal system (muscles)?<br>**(N.B: More than two answers are possible).** | i. Bed-making<br>ii. taking patients' vital signs<br>iii. Wound dressing<br>iv. Medication<br>v. Lifting and transferring patients<br>vi. Bed bath<br>vii. Performing manual orthopedic techniques<br>viii. Writing reports<br>ix. Other(specify)_____ | |

**Part IV. Factors related to patient condition**

| S. NO | Items | Responses |
|---|---|---|
| 401 | How **often do you** give care for patients with disabilities? | 1. All the time<br>2. Most of the time<br>3. Some of the time<br>4. A little of the time<br>5. None of the time |
| 402 | How **often do you** do patient with emergencies? | 1. All the time<br>2. Most of the time<br>3. Some of the time<br>4. A little of the time<br>5. None of the time |
| 403 | How **often do you** give care for patients with confused or agitated patients? | 1. All the time<br>2. Most of the time<br>3. Some of the time<br>4. A little of the time<br>5. None of the time |

**Part V. Factors related to Organization**

| | | |
|---|---|---|
| 501 | Are the beds in your wards/unit height-adjustable? | 1. all of them<br>2. very few<br>3. none |
| 502 | Do you think that there are available materials in your ward unit (hospital) especially for patient manual handling? | 1.Yes<br>0.No |
| 503 | If you said yes question No 502, Do you use work equipment like sliding sheets, lifting hoists, slings and belts at work? | 1. Always<br>2. Sometimes<br>3. Rarely<br>4. Not at al |
| 504 | Do you think that your working environment is conducive (work space, structure and distance)? | 1.Yes<br>0. No |
| 505 | Have you ever had training on manual handling or ergonomics or how to prevent occupational hazards? | 1. Yes<br>2. No |
| 506 | Do you think that there is a Shortage of staff in your organization | 1. Yes<br>2. No |

**Part VI. Job risk factors**

Listed below are the conditions and tasks at work that could contribute to work-related musculoskeletal problems. Please **indicate with a (√)** on a scale of 1 to 3, how much of a problem each item is to you.

***1 = "no problem"***
***2 = "minimal to moderate problem"***
***3 = "major problem***

| ***1 = no problem*** ***2 = minimal to moderate problem*** ***3 = major problem*** | | | | |
|---|---|---|---|---|
| **S. No** | **Work risk factor** | ***1*** | ***2*** | ***3*** |
| 601 | Carrying, lifting, or moving heavy materials or equipments | | | |
| 602 | Working in the same positions for long period (standing, bend over, sitting, stooping) | | | |
| 603 | Working in awkward and cramped positions | | | |
| 604 | Bending or twisting your back in an awkward way | | | |
| 605 | Performing the same task over and over | | | |
| 606 | Reaching or working away from your body | | | |
| 607 | Continuing to work while injured or hurt | | | |

**Thank You for your cooperation**

**Check list for in depth interview**

1. What is your age?
2. Sex?
3. Work experience in year?
4. Working unit
5. Responsibility
6. Hours of work per week?
7. Have you ever experienced work related musculoskeletal pain in the past 1 year?
8. Have you ever seen any other nurses complained this problem in your organization? If yes how many?
9. What factors do you think can cause work related musculoskeletal disorder what you experienced or you have seen on other (your colleague)?
10. How you see the patient condition related factors?
11. How you describe your working environment, is it conducive (space/over crowdedness, structure, distance)?
12. How you describe manual patient handling?
13. How you see the organizational factors?
14. Which nursing activities do you think can cause it?