ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF NURSING AND MIDWIFERY

ASSESMENT OF NURSES' KNOWLEDGE LEVEL AND ASSOCIATED FACTORS TOWARD DIABETIC FOOT CARE MANAGEMENT IN SELECTED GOVERNMENT HOSPITAL, ADDIS ABABA, ETHIOPIA

BY: WUBIT HAILU (B.Sc.)

A THESIS SUBMITTED TO THE SCHOOL OF NURSING AND MIDWIFERY, COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN ADULT HEALTH NURSING.

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DEPARTMENT OF NURSINGMASTER OF SCIENCE RESEARCH THESIS SUBMISSION FORM

Name and description of the principal investigator	Name: Wubit Hailu Educational status: B.Sc. in Nursing Academic rank: M.Sc. student Address: Addis Ababa, Ethiopia Email: Wubit.h@gmail.com Cell phone: +251911813015
Name and description of the primary advisor	Name: Zeleke Argaw Educational status: M.Sc. in Nursing Academic rank: Assistant professor Email: zelekeargaw@yahoo.com Mobile: +251911478796
Name and description of secondary advisor	Name: Tefera Mulugeta Educational status: M.Sc. in Nursing Academic rank: M.Sc. in Nursing, Ph.D. fellow Email: tmulugeta79@yahoo.com Mobile: +251910360495
Full title of the research project	Assessment of Nurses` knowledge level and associated factors toward diabetic foot care management in selected government hospitals, Addis Ababa, Ethiopia
Duration of the project	Six months
Study area	Selected government hospitals, Addis Ababa. Ethiopia

APPROVAL SHEET

ADDS ABABA UNIVERSITY
COLLEGE HEALTH SCIENCES
SCHOOL OF NURSING AND MIDWIFERY
DEPARTMENT OF NURSING

I, the undersigned MSc student, declare that I have submitted my original work on a title Assessment of Nurses Knowledge Level and Associated Factors toward Diabetic Foot Care Management in Selected Government Hospitals, Addis Ababa, Ethiopia

Submitted by:

Wubit Hailu _____ _____

Name of student   Signature   Date

This thesis has been submitted for examination with my approval as an advisor.

Approved by:

Approved by:

1. Zeleke argaw   _____   _____

    Name of Major Advisor   Signature   Date

2. Tefera Mulugeta   _____   _____

Name of Co-Advisor   Signature   Date

APPROVAL BY THE BOARD OF EXAMINATION

This thesis by _____ is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of masters in Adult Health Nursing.

EXAMINER:

Dr. Hussen Mekonen   (MSc, PhD, Ass.Pro)   ----------------   -------------------
NAME   RANK   SIGNITURE   DATE

 RESEARCH ADVISORS:

Zeleke Argaw   (MSc., Asst.Pro)   _____   _____
NAME   RANK   SIGNITURE   DATE

Tefera Mulugeta   (MSc, Ph.D. Fellow)   _____   _____
NAMERANKSIGNITURE   DATE

DEPARTMENT HEAD

Nigussie Tadele   (M.Sc., Asst.Pro)   _____   _____
NAME   RANKSIGNITURE   DATE

STATEMENT OF DECLARATION

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis.

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Wubit Hailu   _____   _____

Student's name   Signature   Date

Zeleke Argaw (M.Sc., Asst.Pro)   _____   _____   _____

 Primary Advisor   Rank   Signature   Date

Tefera Mulugeta   (M.Sc. Ph.D. fellow) _____   _____   _____

Secondary Advisor   Rank   Signature   Date

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ACRONYMS/ABBREVIATIONS

ADA   American diabetic association

DM   Diabetes Mellitus

DFU   Diabetic foot ulcer

IDF   International diabetic federation

SD   Standard Deviation

SPHMMC   St. Paul`s hospital millennium medical college

TASH   Tikur Anbessa specialized hospital

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ABSTRACT

Background: Diabetic foot ulcer is a common and the most fearsome problem among people living with diabetes. The management of diabetic foot complications can be optimized by using an interdisciplinary team that focuses on the correctable risk factors along with optimizing local wound care. Nurses, important members of the diabetes treatment team, have an essential role in the prevention of diabetic foot problems and in the care and education of patients at risk of diabetic foot problems. But there is limited research on nurses` knowledge regarding to diabetic foot care management.

Objectives: The aim of this study was to assess nurses` knowledge level and associated factors toward diabetic foot care management in selected government hospital of Addis Ababa city administration, Addis Ababa, Ethiopia, 2020.

Method: A cross-sectional study design was conducted among nurses who were working in selected government hospitals from March 1 to April 30, 2020. Data was collected using structured self-administered questionnaire on 119 study participants were selected using simple random sampling.

Result: Data was cleaned and entered using Epi-data version 4.2 and then imported to SPSS version 24 for analysis. Frequencies, percentages, means and standard deviations were used for demographic variables and to describe the scores of the study variables. Bivariate and multivariate logistic regression was done to determine the association between the independent variables and dependent variables. The independent variables which become fitted on the bivariate regression less than or equal to p-value of 0.25 was included in the multivariable analysis. The odds ratio with 95% CI and a statistical significance at p value <0.05 was declared to determine the association. Among the participants52.9% of nurses had good knowledge level regarding diabetic foot care management. Factors significantly associated with good knowledge level of diabetic foot care management at p-value<0.05 were married marital status (AOR= 0.242, 95% CI (0.080-0.735)) and working in medical inpatient (AOR=11.057, 95% CI (3.461-35.327).**Conclusion:** Substantial portion56(47.1%) of study participants had poor knowledge level of diabetic foot management.

Key words: Nurses, Knowledge level, Diabetic, Foot Care, Managements, Addis Ababa

CHAPTER ONE

1. Introduction

1.1.   Background of the study

The term Diabetes mellitus (DM), more simply called diabetes, describes a group of metabolic disorders characterized and identified by the presence of hyperglycemia in the absence of treatment. The heterogeneous aetio-pathology includes defects in insulin secretion, insulin action, or both, and disturbances of carbohydrate, fat and protein metabolism(1).

Diabetes is found in every population in the world and in all regions, including rural parts of low- and middle-income countries. The number of people with diabetes is steadily rising, with WHO estimating there were 422 million adults with diabetes worldwide in 2014, with the greatest rise in low- and middle-income countries compared to high-income countries(2). According to International diabetes federation (IDF) report in 2017, 425 million people worldwide suffered from diabetes and due to such increasing rates, it is estimated that by 2045 about 629 million people will be engrossed by diabetes mellitus (3).

Retinopathy with potential loss of vision, nephropathy leading to renal failure, autonomic neuropathy causing gastrointestinal, cardiovascular symptoms, genitourinary, and sexual dysfunction, peripheral neuropathy with risk of foot ulcers, Charcot joints, amputations are Long-term complications of diabetes. Diabetes Patients have higher risk of developing atherosclerotic cerebrovascular, cardiovascular, peripheral arterial disease. Hypertension and abnormalities of lipoprotein metabolism are often found in people with diabetes (4).

Foot problems are among important complication of DM. There is a 15 % chance of diabetics developing a DFU during their life-time (5). Diabetic foot can be defined as full thickness foot ulcer below the ankle in a patient with diabetes, irrespective of the duration of ulcer. Foot ulcers are susceptible to infection and polymicrobial infection may spread rapidly causing overwhelming tissue destruction(6). The most common site for development of foot ulcers is planter surface of fore foot(7).

Diabetic foot ulcer (DFU) is an outcome of complicated amalgamation of various risk factors such as peripheral neuropathy, peripheral vascular disease, foot deformities, arterial insufficiency, trauma and impaired resistance to infection(8).So, it is important to assess the neurological, vascular, dermatological, and musculoskeletal status of people with diabetes at least annually(9). The characteristics of people with diabetic foot often include older age, longer diabetic duration, hypertension, diabetic retinopathy and smoking history (3).

The management of Diabetic foot complications can be optimized by using an interdisciplinary team that focuses on the correctable risk factors along with optimizing local wound care (10). The five main managements of diabetic foot are; education of patient and family, identification of the patient's at-risk for Diabetic foot complications, regular assessment of the at-risk foot, & healthcare providers, appropriate footwear and treatment of non-ulcerative pathology (11).Increasing awareness and knowledge among healthcare professionals about the management of diabetic foot complications and Conducting regular screening and risk stratification for at-risk feet are the two management strategies that should be prioritized(12).

1.2. Statement of the problem

Diabetic foot ulcer is often unpleasant experience due to its chronicity, unsightly nature and some degree of negative psychological feelings associated with having a chronic wound. It is a common and the most fearsome problem among people living with diabetes(13,14).

Diabetic foot disease is among the most serious and incapacitating chronic complications of diabetes mellitus resulting from poor disease management. It is a source of major suffering and financial costs for the patient, and also places a considerable burden on the patient's family, healthcare professionals and facilities and society in general in both developing and developed countries(3,11). Diabetic foot and lower limb complications, which affect 40 to 60 million people with diabetes globally, are an important source of morbidity in people with diabetes. Chronic ulcers and amputations result in a significant reduction in the quality of life and increase the risk of early death(12).

The life-time incidence of foot ulcers has previously been estimated to be 15 to 25% among persons with diabetes, but when additional data are considered, about 19% to 34% of persons with diabetes are likely to be affected(15).

Lower limb amputation in people with diabetes is 10 to 20 times more common compared to those without diabetes. It has been estimated that, globally, a lower limb (or part of a lower limb), is lost to amputation every 30 seconds as a consequence of diabetes, which is more common in low- and middle-income countries than in high-income countries(12).

In addition to causing suffering and morbidity, foot lesions in diabetic patients have substantial economic consequences(16). People with diabetes who have foot ulcers bear health expenditures five times higher than those without foot ulcers. Compared to people with diabetes without foot ulcers, the cost of care for people with diabetes and foot ulcers is 5.4 times higher in the year of the first episode and 2.6 times higher in the year of the second episode(12).

Diabetic foot ulcer patients have a greater than two-fold increase in mortality compared with non-ulcerated diabetic patients. In low-and middle-income countries, foot ulcers are one of the most feared and common complications of diabetes. In Ethiopia, at least one out of ten diabetic patients had diabetic foot ulcers (17), wherein 1.7 million people are living with diabetes mellitus(18).

Sometimes, even after the management of a foot ulcer, recurrence happens commonly. A rough estimation of 40% of patients have a recurrence within 1 year after ulcer healing, almost 60% within 3 years, and 65% within 5 years. Thus, it may be more useful to think of patients who have achieved wound closure as being in remission rather than being healed(15).

There is a lack of understanding of the comprehensive management and treatment of diabetic foot amongst healthcare professionals(3). This study aimed to avail empirical evidence on nurses` knowledge level toward diabetic foot care management and factors that determined the nurses` knowledge level about diabetic foot care management.

CHAPTER TWO

2. Literature review

2.1. Introduction to diabetic foot

Diabetic foot is a severe chronic complication, which is caused by combination of macro vascular disease, neuropathy, and risk for infection(3,19). The typical sequence of events in the development of a diabetic foot ulcer begins with a soft tissue injury of the foot, formation of a fissure between the toes or in an area of dry skin, or formation of a callus(20). Diabetic foot can be avoided with appropriate glycemic control, continuous foot assessment, safe footwear, patient awareness, and early referral for pre-ulcerative lesions(21).

2.2. Diabetic foot care management

Early recognition and treatment of patients with diabetes and feet at risk for ulcers and amputations can delay or prevent adverse outcomes(22). There are five key elements that underpin efforts to prevent foot ulcers, which includes; identifying the at-risk foot, regularly inspecting and examining the at-risk foot, educating the patient, family and healthcare professionals, ensuring routine wearing of appropriate foot wear and treating risk factors for ulceration(11).

The principles of structured diabetic foot management include, not only management of infection, aggressive angioplasty or distal revascularization, application of off-loading principles, surgical debridement and stage-adapted local wound care, but also optimization of metabolic and glycemic control, and treatment of relevant co morbidities (23).In addition to these principles, multidisciplinary diabetic foot care is now becoming a mainstay of therapy(24).

2.3. Knowledge of nurses` toward diabetic foot care management

A wide-ranging literature on diabetic foot revealed that there is a paucity of local and global data focusing on knowledge of nurses toward diabetic foot care management. A survey conducted in Hong Kong showed that, the sample's mean Diabetic Foot care knowledge scale was 41.4 (SD 6.5, range 23–49) out of a total of 65 marks(25).

Across-sectional descriptive study done at Pakistan Institute of Medical Sciences Islamabad for period of three month that was trying to access the knowledge of the nurse through 15 self-created questions showed, 15% of nurses had very low, 18% had low, 17% had moderate, 39% had high and 11% had very high knowledge. The mean knowledge score was 74.2. Of the 15 items tested, eight items were answered correctly by more than 75% of participants(26).

Another non-experimental descriptive cross-sectional survey conducted in three teaching hospitals located in the Western Province of Sri Lanka to assess the nurses' knowledge on diabetic ulcers by 15 MCQs showed that, 10.2% of nurses had very low, 14.3% had low, 17.7% had moderate, 41.5% (n=61) had high and 16.3% had very high knowledge. Of the 15 items tested, eight items were answered correctly by more than 80% of participants (27).

A cross-sectional descriptive study conducted at two tertiary care hospitals in Karachi, Pakistan showed that, the mean score of knowledge was 74.9 (±9.5). Only 54% of the nurses in the study possessed adequate knowledge of diabetic foot ulcers. An evaluation of the nurses' knowledge revealed that 13.0% of nurses had very low knowledge, 15.0% of nurses had low knowledge, 19% of the nurses had a moderate level of knowledge, 40% nurses had high knowledge and 14% of the participants had very high levels of knowledge regarding diabetic ulcer care(5). Another quantitative descriptive cross sectional study design conducted in private sector of Faisalabad, Pakistan showed alike findings to that of the study conducted at two tertiary care hospitals in Karachi, Pakistan (28).

quantitative, descriptive study which was carried out in Jeddah showed that, the overall mean score of nurse's knowledges regarding Diabetic Foot Complications was evaluated as good (75.5%). While the risk factors leading to foot ulcer, hygiene and skin care nurse's knowledge

was evaluated as very good(29). Whereas a descriptive-survey study conducted in Bangladesh showed that, only four nurses (1.9%) had the total knowledge scores 70% and above(30).

A cross-sectional correlational survey study conducted in southwest of Finland showed that, in the total knowledge test, the mean percentage of correct answers was 68.5% (range 27-95%, SD 12.21) and mean number of correct answers 37.7 (range 15–52, SD 6.7), indicating that nurses have gaps in their foot care knowledge(31).

The study conducted in the University of Port Harcourt Teaching Hospital and the Rivers State Hospitals Management Board Hospitals (which include General Hospitals from all the local government areas) in Rivers State, Nigeria revealed that, only 24(24.0%) had knowledge of a standard of diabetic foot care and 76 (76.0%) did not (32).

2.4. Factors associated with nurses` knowledge

2.4.1. Sociodemographic and Professional Characteristics of Nurses

A cross-sectional, descriptive study conducted turkey showed that, the average age of the nurses participating in the survey was 26.37±4.97 Majority of the nurses were female (76.8%), were single (72.6%), and had an undergraduate level of education (61.1%). When the distribution of the nurses according to the unit where they were working was examined, 21.1% were working in the intensive care unit and 66.7% were service nurses. The mean duration of occupational time was 61.22±57.40 months(33).According to Kumarasinghe, nurses' knowledge showed significant associations with their experience in nursing as well as in wound care and the attached unit of work. Nurses with experience had a markedly poor knowledge of diabetic foot care. However, no associations between knowledge and their gender, age, professional qualifications(27).

A cross-sectional correlational survey study conducted in southwest of Finland showed that, score for knowledge of foot care was explained by longer working experience in the current workplace

(p = 0.021), participation in continuing education including lectures (p < 0.001) and lectures with practical training (p < 0.001)(31).The study conducted in the University of Port Harcourt Teaching Hospital and the Rivers State Hospitals Management Board Hospitals (which include General Hospitals from all the local government areas) in Rivers State, Nigeria revealed that, the differences in the years of experience and the knowledge of diabetic foot care was found to be statistically significant (p < 0.05)(32).

2.4.2. Characteristics of Nurses on Diabetic Foot care Management.

A cross-sectional, descriptive study conducted turkey showed that, One-third of the nurses (34%) were trained in diabetic foot care and 29% received training related to the diabetic foot within the curriculum of nursing education. Forty two point eight percent of the nurses needed training in diabetic foot care, primarily in risk factors of the diabetic foot and its etiology(33).A survey conducted in Hong Kong showed that, Registered nurses with prior training in diabetes foot care (number of participant = 28, Mean score = 43.1, SD 5.6) scored higher than those without (number of participant = 37, Mean score = 40.1, SD 6.8), p =0.055, indicating that training may have a higher impact on the development of knowledge than work experience(25).

The study conducted in the University of Port Harcourt Teaching Hospital and the Rivers State Hospitals Management Board Hospitals in Rivers State, Nigeria revealed that, there was a significant difference between nurses that have been trained and those that have not been trained which had 31 – 40 years of experience (p = 0.023)(32).

In general, diabetic foot ulcer is common and incapacitating problem that imposes the highest mortality which can be prevented by Increasing awareness and knowledge among healthcare professionals. Few studies were conducted in developing countries compared to developed countries. Most of the works of the literatures indicated that significant number of the study participants had good knowledge level regarding diabetic foot care management. However, a

little study was conducted to assess the nurses` knowledge level regarding diabetic foot care management in Ethiopia. Hence, the aim of this research was to assess nurses` knowledge level and associate factors toward diabetic foot care management in selected government hospitals of Addis Ababa city administration.

2.5. Justification of the study

The objective of this research was to evaluation of Nurses` knowledge level and associated factors toward diabetic foot care management. Despite the high morbidity and mortality associated with diabetic foot and its cost to both health care providers and the patient and their families. The field continues to attract relatively few clinicians who are interested in research(34). Even though the pooled national prevalence of diabetic foot ulcers among Ethiopian diabetic patients was 11.27% (95% CI 7.22, 15.31%, I2=94.6)(17), little is known about nurses` knowledge level toward diabetic foot care in Ethiopia. Therefore, this study aimed to assess the nurses' knowledge level and associated factors toward diabetic foot care.

2.6. Significance of the study

Diabetic foot is becoming a major public health concern. Its prevalence is also increasing in Ethiopia. Yet, little was known about the nurses` knowledge level about diabetic foot care management, which has important practical value for patients and community at large by providing essential comprehensive diabetic foot care and DFU prevention among diabetic patients and improving patients' health related quality of life.

This study will be an input to policymakers, program managers, health professionals in order to implement early detection, risk stratification, provision of comprehensive multidisciplinary diabetic foot care management among people living with diabetes and to guide the national diabetes control program to support the planning of systems for better DFU control and prevention program. Finally, this paper will be used as a baseline for future researchers.

The rational of studying the Evaluation of Nurses` knowledge level associated factors toward diabetic foot care management will have practical vital value for patients, care providers, researchers and policy-makers in the Ministry of Health and the study will help both the individuals and society at large.

This paper will provide insight for Nurses to know the quality and effectiveness of care provision. Furthermore, knowing diabetic foot management reduces unnecessary treatment. This will also promote nursing research, nursing education and clinical practice so as to provide evidence-based nursing care. Finally, this paper will also be a base line for future researchers.

2.7. Conceptual framework

This conceptual framework is developed by the researcher based on the review and synthesis of concepts from different works of literature sources (26–28,32,33). It is the interaction between independent variables (sociodemographic characteristics of nurses` and nurses` related characteristics) and dependent variable (Nurses knowledge level).

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                    ┌─────────────────────────┐
                    │  Nurses` knowledge level │
                    └─────────────────────────┘
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Sociodemographic characteristics

➢ Sex
➢ Marital status
➢ Age
➢ Professional qualification

Nurses` and professional related characteristics

➢ Nursing experience in years
➢ Wound-care experience in years
➢ Training (wound care)
➢ Working unit
➢ Current professional
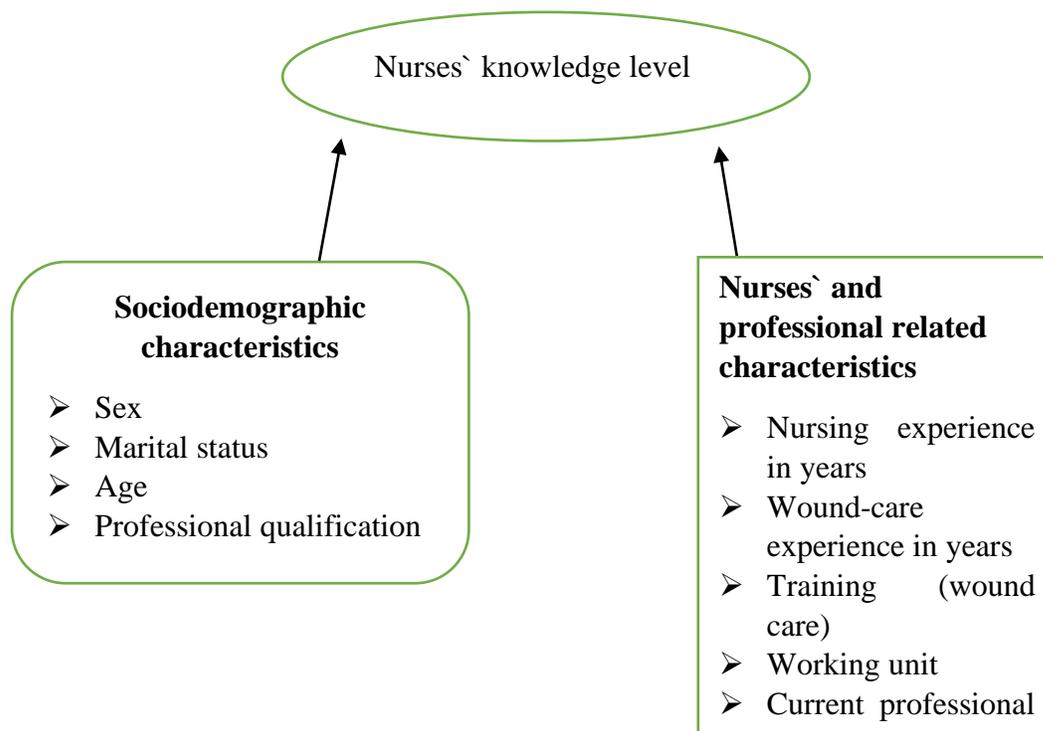
Figure1: conceptual framework for the evaluation of Nurses` knowledge level toward diabetic foot care management.

CHAPTER THREE

3. OBJECTIVES

3.1. General objective

To assess nurses` knowledge level and associated factors toward diabetic foot care management in selected government hospital, Addis Ababa, Ethiopia, 2020

3.2. Specific objectives

1. To assess nurses` knowledge level of diabetic foot care management

2. To determine factors associated with nurses' knowledge level of diabetic foot care management

CHAPTER FOUR

4. METHODOLOGY

4.1. Study area and study period

This study was conducted in the selected hospitals in Addis Ababa, Ethiopia. Addis Ababa, the capital city of Ethiopia. Addis Ababa city has a total population of 3,384,569. Its altitude is 7,546 feet (2,300 meters). The City has surface area of about 530.14 km^2. Amharic (71.0%), Oromiffa (10.7%), Gurage (8.37%), Tigrigna (3.60%), Silt'e (1.82%) and Gamo (1.03%). Are Languages spoken in the city? There are a total of 41 hospitals in the city. The study was conducted at five selected public hospital. The actual data collection was carried out from March 1to April30. 2020.

4.2. Study design

Institutional-based cross sectional quantitative study was conducted.

4.3. Population

4.3.1. Source of population

All nurses who were working at public health hospitals in Addis Ababa City administration Addis Ababa Ethiopia.

4.3.2. Study population

Selected nurses' who fulfilled the inclusion criteria and were available during the time of data collection.

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion criteria

All nurses, who are currently working in the medical ward and diabetic clinic of the selected hospitals

4. 4.2. Exclusion criteria

Nurses inaccessible during data collection; sick leave, annual leave and maternity leave.

4.5 sample size determination

The required sample size of eligible participants for the study was determined by using a single population proportion formula by considering the following statistical assumptions.

P =the estimated proportion nurses' good knowledge of diabetic foot care management was assumed 50%. Because, there is no a study conducted in Ethiopia.

$Z_{\alpha/2}$ = the corresponding Z score of 95% CI, d= Margin of error (5%) and n= Sample size

Formula: $n = \dfrac{(Z_{\frac{\alpha}{2}})^2 \times p(1-p)}{(d)^2}$

$n = \dfrac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2} = 384$

The total number of nurses where the sample was drawn in the five selected hospital are 150 (Tikur Anbessa specialized hospital (44), Zewuditu memorial hospital (31), St. Paul`s hospital millennium medical college (45), Yekatit 12 hospital (14) and Minlik II hospital (16)). So, since this figure is below 10,000, correction formula was used for the sample size determination:

$$nf = \dfrac{n}{1 + n/N}$$

 Where nf=the final sample size

n= initial sample size

N=The total number of nurses

$$nf = \dfrac{384}{1 + 384/150}$$

nf= 107.9 approximated to 108, Adding 10 % (10.8) for non-response rate, Therefore, the required sample size of this study was108+10.8= 118.8which was approximated to 119.

4.6. Sampling procedure

The study participants for each unit were proportionally allocated and those who were part of the final sample size were selected using simple random sampling technique.

The total number of nurses in five selected hospital=150
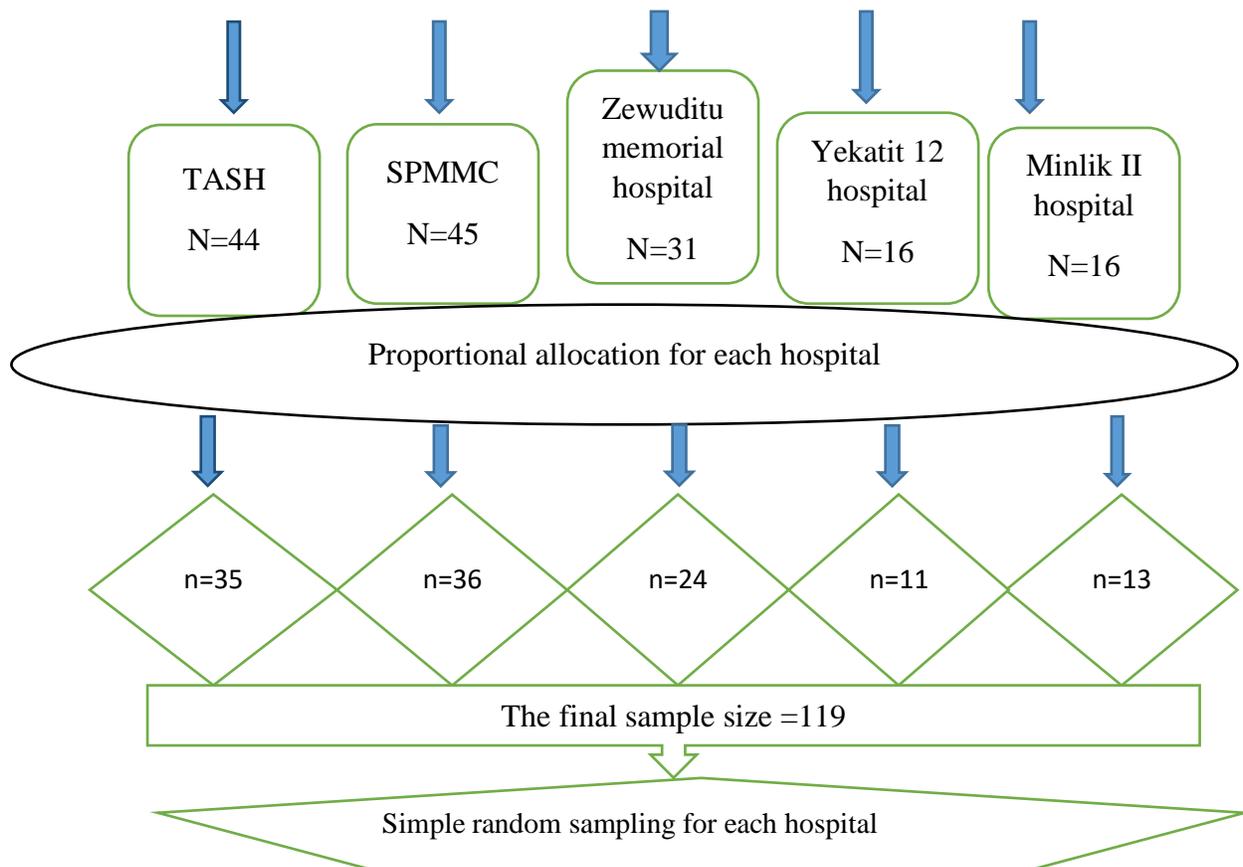
Figure 2: schematic presentation of sampling procedure to assess Nurses` knowledge level and associated factors toward diabetic foot care management in selected government hospital in Addis Ababa City, Addis Ababa, Ethiopia

7. Study variables

4.7.1. Dependent variable:

Nurses' knowledge level

4.7.2. Independent variables:

Sociodemographic characteristics;

- age
- sex
- marital status
- professional qualification

Nurses` related characteristics;

- Nursing experience (in years)
- Wound-care experience in years
- Training (wound care)
- Working unit

4.8. Operational Definitions

Diabetic foot: refers to an area of necrosis or gangrene distal to the ankle in a diabetic patient(26).

Level of knowledge: means the nurses' perception and understanding of diabetic foot care management. It is categorize as good knowledge and poor knowledge. Good Knowledge of diabetic Foot Care: include participants who scored mean or above on knowledge questions.

Poor Knowledge of diabetic foot Care: include participants who scored below the mean on knowledge questions.

4.9. Data collection tools

A structured self-administered questionnaire was used to collect data from participants. It was adapted from Sri Lanka(27)with some modification by researcher. The questionnaire has two sections.

The first section of the questionnaire was the sociodemographic and nurses` related characteristics, which include items such as age, sex, marital status, educational qualification/status, nursing experience, wound care experience, training (wound care), continuous professional development activities, and working unit.

greater than the mean score for knowledge were presumed to have good knowledge about diabetic foot care. In contrast, poor knowledge was classified as a score lesser than the mean value for knowledge.

The second section of the study tool was to gauge the level of knowledge possessed by nurses about diabetic foot care management. Hence, the knowledge section comprised 15 items focusing on risk factors, descriptions, and the management of diabetic foot. The three options provided for each question were "correct," "incorrect," and "I do not know," The scoring criteria will work as follows: A score of 1 for each correct answer whereas incorrect answers and questions marked "I do not know" received a score of zero.

4.10. Data Collection Procedures

Five B.Sc. nurses`, two supervisors, M.Sc. student were involved during data collection. After recruiting data collectors and supervisors, one-day intensive training was given to them prior to

the actual work begin about the aim of the study, procedures including ways of collecting the data and clarify about the questionnaire. The questionnaires were hand-delivered to ensure a higher response rate. The completed questionnaires were collected on the same day within 4 hours of distribution to improve data quality. The principal investigator checked all the questionnaires for completeness.

4.11. Data Quality Assurance

The quality of data was assured before, during and after data collection accordingly.

Before data collection: - objective based and standardized questionnaire was prepared. Pretest on 10 % of study participants was done at Tirunesh Beijing hospital. Training was given to the data collectors. The purpose of the training was to introduce the objective and methodology of the research, data collection approach.

During data collection: - the principal investigators insured completeness and consistence of the questionnaires administered each day.

After data collection: -the collected information was rechecked for its completeness and consistence by the principal investigators before transferring to a computer software. Non overlapping code was given for each question and the coded data was entered and cleaned in Epi data version 4.2.

4.12. Data processing and analysis

Data was cleaned, edited, coded and then entered using epi data 4.2 and then transferred into SPSS version 24 for analysis. Frequencies, percentages, means and standard deviations were used for demographic variables and to describe the scores of the study variables. Bivariate and multivariate logistic regression was done to determine the association between the independent variables and dependent variables. The independent variables which become fitted on the bivariate regression less than or equal to p-value of 0.25 was included in the multivariable analysis. The odds ratio with 95% CI and a statistical significance at p value <0.05wasdeclared to determine the association.

4.13. Ethical clearance

Ethical clearance was obtained from Institutional Review Board (IRB) of Addis Ababa University, school of Nursing and Midwifery. Permission to recruit participants and collect data was obtained from relevant hospital authorities. In addition, informed consent was obtained from study participants and the right to refuse or terminate at any point of the interview was assured. Data was collected and stored anonymously to ensure confidentiality.

4.14. Dissemination of the study

The result of the study will be presented and submitted to School of Nursing and Midwifery College of Health Science, Addis Ababa University in partial fulfillment of the requirements for the degree of masters in adult health nursing. Addis Ababa five selected government Hospitals, Addis Ababa Administration health bureau. Finally, it will be published in peer reviewed journals for further utilization.

CHAPTER FIVE

5. RESULTS

5.1. Socio-demographic and nurse`s related characteristics

A total of 119 respondents participated in the study, yielding a response rate of 100%.

Among 119 nurses, 96(80.7%) were females. The mean age of the respondents were 32 years old which ranged from 23 to 55years. Majority of them (85.7%) completed Bachelor degree. Ninety-four (79%) study participants had never received any training regarding management of diabetic foot care. The average years of duration of wound care experience was 4.34(SD = 4.334), ranging from 1-28 years (Table 1).

Table 1: Socio-demographic and Nurses` related characteristics of nurses working Selected Government Hospitals, Addis Ababa, Ethiopia, 2020 (n=119)

Variable	Number/frequency	Percentage
Age		
≤30	69	58
31-45	42	35.3
≥46	8	6.7
Sex		
Male	23	19.3
Female	96	80.7
Marital status		
Single	56	47.1
Married	58	48.7
Divorced	5	4.2
Educational level		
Diploma	5	4.2
Bachelor degree	102	85.7
Master's degree and above	12	10.1
Nursing experience (in years)		
≤5	52	43.7
6–10	39	32.8
11–15	16	13.4
16–20	5	4.2
>20	7	5.9
Wound care experience (in years)		
≤5	88	74
6–10	23	19.3
11–15	3	2.5
16–20	3	2.5
>20	2	1.7
Formal training on wound care		
Yes	25	21
No	94	79
Current professional development activities		
No	49	41.18
In-service education	22	18.49
In a degree program	44	36.97
Other	4	3.36
Hospital unit		
Diabetic clinic	35	29.41
Medical ward	84	70.59

5.2. Nurses knowledge toward diabetic foot care management

The mean knowledge score was 58%. The total mean score for knowledge was (9.54 ± (SD 2.564)). Sixty-three (52.9%), 95% CI (42%-61.3%), subjects had good knowledge about diabetic foot care. The rest fifty-six (47.1%), 95% CI (38.7%-58%) of the study subjects had poor knowledge about diabetic foot care. (Figure 3)
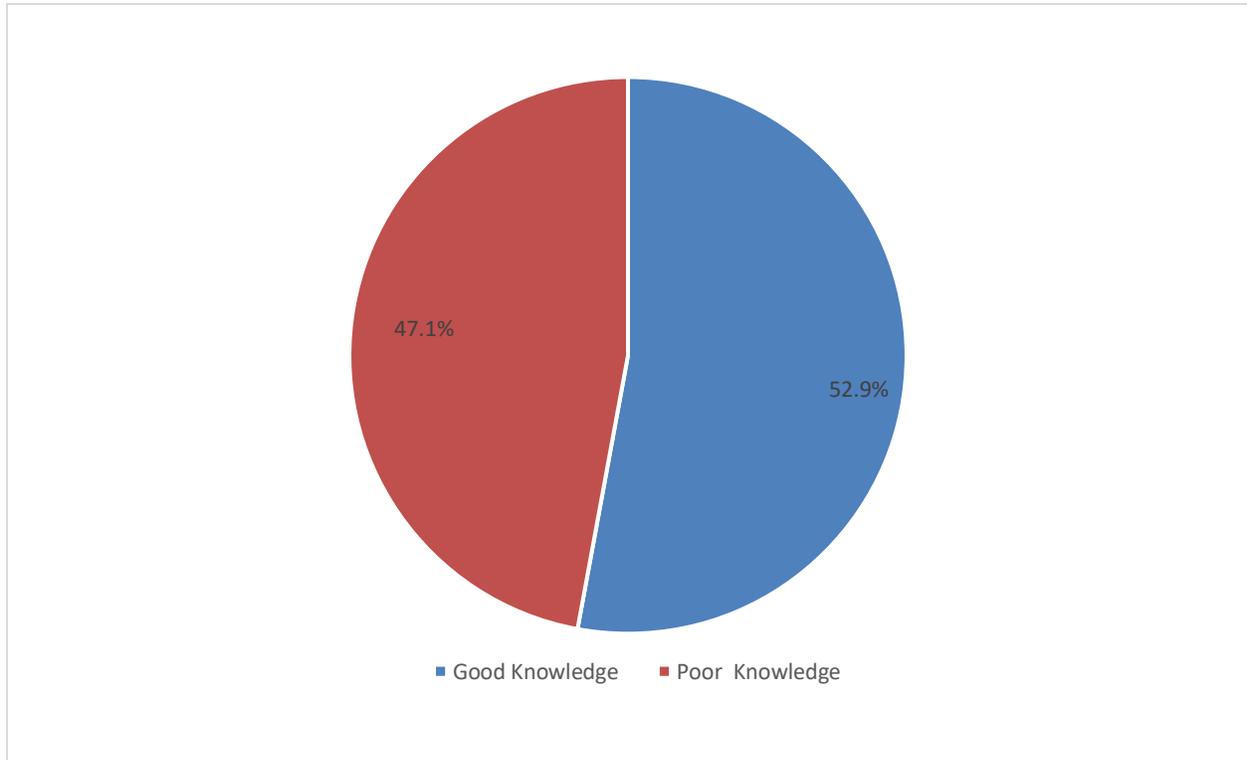
Figure 3: Nurses` knowledge level toward diabetic foot care management

Among tested 15 items, four items were answered correctly by more than 75% of participants. The highest percentage of correct responses to a question (93.3%) were regarding the risk of amputation is higher when diabetic foot ulcer is associated with limb ischemia. The lowest percentage of correct response (25.2%) were regarding hyperbaric oxygen therapy is recommended for ulcer healing even in a well-perfused foot (Table 2).

Table 2:Nurses` knowledge level toward diabetic foot management in Selected Governmental Hospitals, Addis Ababa, Ethiopia, 2020, (n=119)

Item	Correct (%)	Incorrect (%)	Don't know (%)
Neuropathy is the predominant factor responsible for diabetic ulcers	100(84)	9(7.6)	10(8.4)
Sensory neuropathy results in unnoticed skin damages which lead to formation of ulcers	91(76.5)	16(13.4)	12(10.1)
Autonomic neuropathy is associated with dry skin which predisposes to ulcer formation	77(64.7)	14(11.8)	28(23.5)
Diabetic neuropathic ulcers are typically found on weight bearing areas of the foot	90(75.6)	22(18.5)	7(5.9)
Diabetic ischemic ulcers are less painful than diabetic neuropathic ulcers	34(28.6)	61(51.3)	24(20.2)
Neuropathy can be excluded if the foot skin is cool and pulses are absent	51(42.9)	53(44,5)	15(12.6)
The risk of amputation is higher when diabetic foot ulcer is associated with limb ischemia	111(93.3)	4(3.4)	4(3.4)
Presence of slough is not an indication of infection in diabetic ulcers	37(31.1)	46(38.7)	36(30.3)
Presence of osteomyelitis impairs healing of diabetic ulcers	78(65.55)	30(25.21)	11(9.24)
Wound healing progress is unsatisfactory if the wound bed appears pink	64(53.8)	41(11.8)	14(11.8)
Mechanical off-loading should be advised to facilitate ulcer healing	72(60.5)	18(15.1)	29(24.4)
Hyperbaric oxygen therapy is recommended for ulcer healing even in a well-perfused foot	30(25.2)	50(42)	39(32.8)
Infected, highly exuding wounds should be cleansed daily	110(92.4)	8(6.7)	1(0.8)
Iodine dressings are effective for wounds with clinical signs of infection	70(58.8)	34(28.6)	15(12.6)
Hydrogel dressings are useful to rehydrate the wound bed and control the moisture in wounds	80(67.2)	19(16)	20(16.8)

5.3. Bivariate analysis on factors associated with nurses` knowledge level toward diabetic footcare management

In bivariate analysis age, marital status, nursing experience, current professional development activities and hospital unit were fitted at (p < 0.25) and show statistically significant association with good knowledge level (See Table 3). Those variables with p-value <0.25 in the bivariate analysis were included in multivariable analysis.

Table 3: Bivariate analysis on factors associated with nurses` knowledge level toward diabetic foot care management in Selected Government Hospitals, Addis Ababa Ethiopia, 2020

Variable		Knowledge level		COR(95%CI)	p-value
		Good (%)	Poor (%)		
	≤30	28(40.6)	41(59.4)	1	
Age	31-45	28(87.5)	14(12.5)	0.341(0.153-0.761)	0.009
	≥46	7(87.5)	1(12.5)	0.098(0.011-0.837)	0.034
Sex	Male	12(52.1)	11(47.9)	1	
	Female	51(47.9)	45(42.1)	0.963(0.387-2.394)	0.935
Marital status	Single	20(51.8)	36(47.2)	1	
	Married	39(50)	19(50)	0.271(0.125-0.587)	0.001
	Divorced	4(80)	1(20)	0.139(0.015-1.329)	0.087
	Diploma	1(60)	4(40)	1	
Educational level	Bachelor degree	56(52)	46(48)	0.205(0.022-1.902)	0.163
	Master's degree and above	6(50)	6(50)	0.250(0.021-2.945)	0.271
	≤5	21(36.8)	31(63.2)	1	
Nursing experience (in years)	6–10	19(48.7)	20(51.2)	0.713(0.309-1.647)	0.429
	11–15	14(53.8)	2(46.2)	0.097(0.020-0.471)	0.004
	16–20	4(80)	1(20)	0.169(0.018-1.623)	0.124
	>20	5(83.3)	2(16.7)	0.271(0.048-1.530)	0.139
	≤5	45(51.1)	43(48.9)	1	
Wound care experience (in years)	6–10	14(60.9)	9(39.1)	0.673(0.264-1.715)	0.406
	11-15	1(33.3)	2(66.7)	2.093(0.183-23.931)	0.552
	16-20	2(66.7)	1(33.3)	0.523(0.046-5.983)	0.602
	>20	1(50)	1(50)	1.047(0.063-17.264)	0.975
Formal training on wound care	Yes	16(64)	9(36)	0.563(0.226-1.339)	0.216
	No	47(50)	47(50)	1	
	No	24(49)	25(51)	1	
Current professional development activities	In-service education	18(81.8)	4(18.2)	0.213(0.063-0.722)	0.013
	In a degree program	20(45.4)	24(54.6)	1.152(0.509-2.605)	0.734
	Other	1(33.3)	3(66.7)	2.880(0.280-29.634)	0.374
Hospital unit	Diabetic clinic	31(88.6)	4(11.4)	1	
	Medical ward	32(38.1)	52(61.9)	12. 594(4.066-39.008)	0.000

Key: *statistically significant if p- value <0.25 crude odds ratio (COR)

Reference category1

5.4. Multivariable analysis on factors associated with nurses` knowledge level toward diabetic foot management

In multivariable analysis marital status and hospital unit were significant predictors of good knowledge level (P-value<0.005). Nurses who are married are 75.7% less likely to have good knowledge than those who are single in marital status (AOR= 0.242, 95% CI (0.080-0.735)) at p-value <0.05.Nurses who are working in medical ward are 11.057 times more likely to have good knowledge compared to those nurses who are working diabetic clinic (AOR=11.057, 95% CI (3.461-35.327)(Table 4).

Table 4: Multivariable analysis on factors associated with nurses` knowledge level toward diabetic footcare management in selected Government Hospitals ,Addis Ababa Ethiopia, 2020

Variable	Category	AOR(95%CI)	p-value
Age	≤30	1	
	31-45	0.917(0.330-2.546)	0.868
	≥46	0.220(0.022-2.227)	0.200
Marital status	Single	1	
	Married	0.242(0.080-0.735)	0.012
	Divorced	0.123(0.008-1.878)	0.132
Nursing experience (in years)	≤5	1	
	6–10	2.151(0.677-6.831)	0.194
	11–15	0.376(0.059-2.3900	0.300
	16–20	2.316(0.128-41.983)	0.570
	>20	0.900(0.117-6.934)	0.919
Current professional development activities	No	1	
	In-service education	0.381(0.100-1.446)	0.156
	In a degree program m	0.945(0.396-2.256)	0.898
	Other	7.571(0.374-153.102)	0.187
Hospital unit	Diabetic clinic	1	
	Medical ward	11.057(3.461-35.327)	0.000

Key: **statistically significant if p- value <0.05, Adjusted odds ratio (AOR)

Reference category1

CHAPTER SIX

6. DISCUSSION

Knowledge of diabetic foot care is crucial in the appropriate practice of diabetic foot care with the aim of improving the quality of life of diabetic patients. There is a limited literature regarding to nurses` knowledge level toward diabetic foot care management and factors influencing nurses` knowledge level. Therefore, this study was conducted with the intention to assess nurses' knowledge level and associated factors toward diabetic foot care management in selected government hospital, Addis Ababa, Ethiopia.

The study showed that the mean (±SD) knowledge score of study participants was 9.54 (±2.564). The current study found that about 63(52.9%) of respondents had good knowledge level toward diabetic foot care management. This study is consistent with the study conducted at Pakistan Institute of Medical Sciences Islamabad (56%)(26). But, the finding of this study is lower when compared with the studies conducted at three teaching hospitals located in the Western Province of Sri Lanka (68.2%) (27), private sector of Faisalabad, Pakistan (65.3%) (28) and two tertiary care hospitals in Karachi, Pakistan (65.3%) (5). The finding of this study is also lower when compared to the studies conducted in private hospital in Istanbul (86.3%) (33) and University of Port Harcourt Teaching Hospital and the Rivers State Hospitals Management Board Hospitals (which include General Hospitals from all the local government areas) in Rivers State, Nigeria($\geq$ 64.0%) on the different aspects of diabetic foot care among the nurses)(32)

This could be due to the differences in technological advancement, nursing curriculum regarding diabetic foot care management, educational level of the nurses or may be related to participating in continuing education programs after basic education. Therefore, the knowledge level of diabetic foot care management of nurses working in institutions should be evaluated, and missing aspects should be addressed and misconceptions should be corrected.

In addition, problem-oriented nursing care and evidence-based practice and knowledge regarding prevention and management of DFU has to be implemented in nursing curriculum.

Nurses who are married are 75.7% less likely to have good knowledge than those who are single in marital status. This could be due to the fact that single individuals have adequate time to update themselves, participate in continuous professional development activities.

Nurses working in medical ward were 11.057 times more likely to have good knowledge compared to those nurses who are working diabetic clinic. The finding of this study is supported by a study conducted in three teaching hospitals located in the Western Province of Sri Lanka(27). This may be due to possibly nurses attached to inpatient clinical nursing units compared to diabetic clinic possibly due to more exposure they get in wound care. This shows that more experienced nurses in wound care have demonstrated higher knowledge than less experienced nurses.

CHAPTER SEVEN

7. STRENGTHS AND LIMITATIONS OF THE STUDY

7.1. Strengths

The strength of this study was using contextually adapted standardized questionnaire. The data were analyzed using proper techniques. Ethical considerations were taken and respondents gave responses at ease i.e., response rate was 100%. The study conducted at five selected hospitals.

Being the first study in our country or Addis Ababa on nurses

7.2. Limitation of the study

Limitation of related literatures to compare and discuss some of the findings.

Because the data are cross sectional, the direction of causal relationship between variables cannot always be determining.

Qualitative data collection method was not used.

CHAPTER EIGHT

8. CONCLUSION AND RECOMMENDATION

8.1. Conclusion

The study revealed that substantial number 56(47.2%) had poor knowledge level of diabetic foot care management. Being married in marital status (AOR=0.242, 95% CI (0.080-0.735)) and working in medical ward (AOR= 11.057, 95%CI (3.461-35.327)) are statistically associated with knowledge level of nurses` toward diabetic foot care management at p value <0.05.

8.2. Recommendations

To federal minister of health and policy maker

The knowledge level of diabetic foot care management of nurses working in institutions should be evaluated, and missing aspects should be addressed and misconceptions should be corrected. In addition, problem-oriented nursing care and evidence-based practice and knowledge regarding prevention and management of DFU has to be implemented in nursing curriculum.

To health institutions

The Step-by-Step Diabetic Foot Project should be implemented by health institutions, which is a training program that focuses on: creating more awareness of diabetic foot problems; providing sustainable training of healthcare professionals in diabetic foot care management; facilitating the transfer of information and expertise among health professionals and export ideas to other developing countries; reducing the risk of lower limb complications in people with diabetes; and empowering people with diabetes to care for their feet better, detect problems earlier and seek timely help when problems arise.

To researchers: Further study should be conducted using quantitative and qualitative method

CHAPTER NINE

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CHAPTER TEN

ANNEXES

Annex A: Information Sheet

Title of the Research proposal: evaluating nurses knowledge level toward diabetic foot care management at selected public hospitals in Addis Ababa, Addis Ababa, Ethiopia, 2020

Name of Investigator: Wubit Hailu, B.Sc.

Name of the Organization: Addis Ababa University, College of Health Science, School of Nursing and Midwifery, Department of Adult health nursing

Name of the Sponsor: Addis Ababa University

Purpose of the Research Project: To assess nurses knowledge level and associated factors toward diabetic foot care management at selected public hospitals in Addis Ababa, Addis Ababa, Ethiopia, 2020

Procedure: The procedure of data collection is easy and straightforward; data concerning your socio demographic characteristics occupational factors knowledge toward diabetic foot care level will be collected using standardized self-administered questionnaire.

Risk and /or Discomfort: The name or any other identifying information will not be recorded on the questionnaire and all information taken will be kept strictly confidential and in a safe place. The information retrieved will only be used for the study purpose.

Benefits: The research has no direct benefit for those who participated in this study. The information obtained from this study may be useful to the body of nursing to increase understanding in the management of diabetic foot care.

Confidentiality: To reassure confidentiality the data on the chart will be collected without the name of the participant and the information collected will be kept confidential and will be stored in a file cabinet. In addition, it will not be revealed to anyone except the investigator and it was kept in a key and locked system with computer password.

Person to contact: This research project was reviewed and approved by the institutional review board of school of nursing and midwifery, college of health sciences, Addis Ababa University. If you have any question you can contact any of the following individuals (Investigator and Advisors) and you may ask at any the time you want.

Zeleke Argaw, M.Sc., Assistant. Professor: Addis Ababa University, College of Health Sciences, School of Nursing and Midwifery

Tefera Mulugeta, M.Sc., Ph.D. Fellow: Addis Ababa University, College of Health Sciences, School of Nursing and Midwifery.

Wubit Hailu, B.Sc.: Addis Ababa University, College of Health Sciences, School of Nursing and Midwifery

Cell phone: +251911813015, E-mail: Wubit.h@gmail.com

Annex B. Consent Form

Based on the understanding of the information I gave you, are you willing to participate in this study?

1. Yes [ ] _____signature, continue

2. Not agree to participate (stop here); thank you very much! If the study subject agrees to participate in the study, start the interview. Interviewer signature certifying that informed consent has been given verbally by the respondent. NB: No need of enforcing the respondent to be included in the study

Data collectors name _____ Signature _____Date __/__/____

Result of interview A) Completed B) Not completed C) Partially completed D) Refused

Annex C: Questionnaire

Part I: socio-demographic and nurse`s related characteristics

No	Variable	Response
1	Age	………. years old
2	Sex	1. Male 2. Female
3	Marital status	1. Single 2. Married 3. Divorced 4. Widowed
4	Educational level	1. Diploma 2. Bachelor degree 3. Master's degree and above
5	Nursing experience (in years)	1. ≤5 2. 6–10 3. 11–15 4. 16–20 5. >20
6	Wound care experience (in years)	1. ≤5 2. 6–10 3. 11–15 4. 16–20 5. >20
7	Formal training on wound care	1. Yes 2. No
8	Current professional development activities	1. No 2. In-service education 3. In a degree program me 4. Other
9	Hospital unit	1. Diabetic clinic 2. Medical ward

Part II: nurses' knowledge toward diabetic foot care

No	Item	Response		
		Correct	Incorrect	Don't know
1	Neuropathy is the predominant factor responsible for diabetic ulcers			
2	Sensory neuropathy results in unnoticed skin damages which lead to formation of ulcers			
3	Autonomic neuropathy is associated with dry skin which predisposes to ulcer formation			
4	Diabetic neuropathic ulcers are typically found on weight bearing areas of the foot			
5	Diabetic ischemic ulcers are less painful than diabetic neuropathic ulcers			
6	Neuropathy can be excluded if the foot skin is cool and pulses are absent			
7	The risk of amputation is higher when diabetic foot ulcer is associated with limb ischemia			
8	Presence of slough is not an indication of infection in diabetic ulcers			
9	Presence of osteomyelitis impairs healing of diabetic ulcers			
10	Wound healing progress is unsatisfactory if the wound bed appears pink			
11	Mechanical off-loading should be advised to facilitate ulcer healing			
12	Hyperbaric oxygen therapy is recommended for ulcer healing even in a well-perfused foot			
13	Infected, highly exuding wounds should be cleansed daily			
14	Iodine dressings are effective for wounds with clinical signs of infection			
15	Hydrogel dressings are useful to rehydrate the wound bed and control the moisture in wounds			