

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF NURSING AND MIDWIFERY

SELF-CARE PRACTICES IN TYPE 2 DIABETES ADULTS WITH AND WITHOUT COMORBID PERIPHERAL NEUROPATHY IN ADDIS ABABA, ETHIOPIA, 2020

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Annex VII; Approval Sheets

I hereby certify that I have read and evaluate this thesis entitled by “type 2 diabetes self- care practice adult with and without comorbid peripheral neuropathy in Addis Ababa governmental hospitals, Addis Ababa, Ethiopia, 2020. I recommend that it is submitted as fulfilling the thesis requirement.

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STATEMENT OF DECLARATION

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LIST OF ABBREVIATION AND ACRONYM

AAU	Addis Ababa university
AOR	Adjusted odds ratio
BMI	Body mass index
DM	Diabetes Mellitus
DPN	Diabetes Peripheral Neuropathy
DSCP	Diabetes Self Care Practice
DSME	Diabetes Self-Monitoring Education
FBS	fasting blood sugar
HbA1c	Hemoglobin A1C or Located hemoglobin
IDF	International Diabetic Federation
MNSI	Michigan Neuropathy Screening Instrument
SMBGL	Self-monitoring blood glucose level
SPHMMC	St Paulo's Hospital Millennium Medical College
TASH	Tikur Anbesa Specialized Hospital.

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ABSTRACT

Background: Diabetes self-care practice is essential to prevent and control complications of diabetes mellitus. There are some studies conducted regarding diabetes self-care in Ethiopia but there is no one in type 2 diabetes adults who have comorbid peripheral neuropathy.

Objectives: The aim of this study was to assess self-care practice in type 2 diabetes adults with and without comorbid neuropathy in Addis Ababa

Methods: An institution based cross-sectional study was conducted at three governmental hospitals: Tikur Anbessa Specialized Hospital, St. Paul Hospital, and Zewditu Memorial Hospital. Sample size was 216 type 2 diabetes adults (108 with peripheral neuropathy 108 without it). Sociodemographic variables, neurologic states, personal and self-care practice parameters were checked during data collection. Data coding and cleaning was done before the analysis of the data. Linear regression analysis was used to assess the association between dependent and independent variables.

Result: A total of 216 study participants were included in the study with the response rate of 99.1% and from this 111(55.4%) were female. In this study, type 2 DM without peripheral neuropathy had better diet, exercise, foot care, and SMBGL practice with significant mean difference (p -value < 0.01). Dietary self-care practice decreases by 0.022 units for every 1 mg/dl increase in FBS while dietary self-care practice increases by 0.228 units for every 1 unit increase in social support score in type 2 DM patients without peripheral neuropathy. Housewife (P -value = 0.013) and others occupational group (P = 0.030) were significantly associated with exercise self-care practice among type 2 diabetes patients without peripheral neuropathy. Being male was significantly associated with foot self-care practice among patients without peripheral neuropathy (P -value = 0.019). Being student by occupation (P -value = 0.016) and having glucometry at home (P -value = 0.003) were significantly associated with SMBGL practice among patients without peripheral neuropathy.

CONCLUSION: Type 2 DM patients without peripheral neuropathy have good diet, exercise, foot care, and SMBGL practice than with peripheral neuropathy.

Key Words: Type2 diabetes, self-care practice, peripheral neuropathy.

CHAPTER I

1. Introduction

1.1.1 Background of the Study

Type 2 diabetes mellitus which is also formerly called non-insulin dependent diabetes mellitus results from cellular insulin resistance and relative insulin deficiency. Type 2 diabetes accounts for more than 90% of the total diabetes mellitus cases(1).Type 2 diabetes is a chronic metabolic disorder which is characterized by multiple long-term complications that affect almost every system in the body, including neuropathy that can lead to foot ulcers and amputation (2).

Diabetic neuropathy (DNP) is one of the most common long-term complications of type 2 diabetes. Many of the metabolic disturbance and inflammatory processes resulting from toxic adiposity likely contribute to the development of neuropathy(3). Diabetes mellitus causes a broad spectrum of neuropathic complications, including acute and chronic forms of complication affecting each level of the peripheral nerve system, from the central root to the peripheral or distal axon (4).

DPN has an insidious onset and different atypical clinical manifestations. Early screening and diagnosis are recommended at every health institution which is the key factor for a better prognosis and preventing diabetic foot ulcers, amputation, or disability. Diagnostic tests for DPN are often not properly performed in resource limited settings because of lack of diagnostic equipment like tuning fork, mono filament test equipment and poor assessment knowledge and skills(5).DNP is characterized by neuropathic symptoms including uncomfortable tingling (dysesthesia), pain (burning; shooting or electric-shock like; laminating or knife-like; crawling, or aching etc., in character), evoked pain (allodynia, hyperesthesia), or unusual sensations (such as a feeling of swelling of the feet or severe

coldness of the legs when clearly the lower limbs look and feel fine, odd sensations on walking likened to 'walking on pebbles' or 'walking on hot sand') (6).

Diabetes self-care has been defined as an evolutionary process of development of knowledge, skill and awareness by learning to survive with the complex nature of the diabetes in a social context, because the vast majority of day-to-day care in diabetes mellitus is handled by patients or families (7). It is an essential method of self-regulation and managing the progression of diseases processes through the performance of activities including diet management, exercise, blood glucose monitoring, insulin injection, cessation of cigarette smoking and alcohol consumption. Diabetes self-care practices are considered as a cornerstone of diabetes mellitus management program(8).

Self-monitoring of blood glucose (SMBG) is an important methods of self-care practice to monitor glucose level in pre and postprandial time are using in the diabetic self-monitoring protocol, but the recommended frequency of testing time may varied depend on severity of diabetes mellitus(9).Patient engagement in self-care practice is recognized as a crucial component of diabetes management, particularly in type 2 diabetics. The engagement of diabetic patients in the self-management of their health should be established, with the patient's active roles in their own healthcare practice(10).

1.1.2 Statement of the problem

Diabetes mellitus is a global health problem. According to the International Diabetes Federation (IDF) globally 463million(9.3%) of people living with diabetes in 2019and this will increase to 700 million (10.9%) by 2045(11). In Africa, 19 million adults (age 20-79) are living with diabetes. This will increaseto47 million by 2045.Diabetes mellitus has high economic burden in Africa which is 10 billion US\$ spend to diabetes in 2019 this will increase to 17 billion US\$ by 2045(12).The prevalence of diabetes mellitus in Ethiopia is3.2%(13).

Diabetic foot disease is the most common complication of type 2 diabetes mellitus. It results from deteriorating conditions such as diabetic neuropathy (DNP) and foot ulcers causing potentially devastating sequel including morbidity and mortality (14).DPN is a major cause of physical disability, resulting from foot ulceration and amputation of the lower limb. More than half of DM cases (53%) have DPN, clinical problem which has a significant negative effect on patient's quality of life (15).

The management of diabetes mellitus largely depends on patients' ability to perform self-care practices in their daily lives, which include adherence to medication regimen, diet management, physical exercise, blood glucose self-monitoring, foot care, and cessation of smoking and alcohol consumptions. Persons who have knowledge and skill about diabetes self-care practice are better for long term control of diabetes mellitus and for reducing the rate of complications (16,17).

Diabetes self-care is a complex behavioral and social process, requiring not only a comprehensive understanding of the condition but also high levels of self-efficacy. Unfortunately, having diabetes can negatively impact the quality of life for people living with this condition (18). Lack sufficient knowledge and awareness about the risk factor, prevention, complication, management and progression of diabetes mellitus due to illiteracy and unclear

information given to patients by health professionals can be the cause of poor engagement of diabetes self-care practices(19).

Patients must give meaning to their diabetes and its management through a complex frame of subjective experiential dimensions which is (cognitive/thinking, behavioral/conative and emotional/feeling), which have an impact on the spheres of daily life that are considered to be crucial to management of diabetes by improving diet, and physical activity

Diabetes self-care practices vary with educational level in which respondents with lower educational level were likely to have poor self-care behavior than those with higher level of education(20).

Diabetes self-care practices are very important to keep the disease under control and prevent complications. Effective management of diabetes will be challenged without adequate diabetes self-care practice(21).

Diabetes self-care practices are promising behaviors to reduce complications of diabetes mellitus and to achieve good glycemic control(22). Though some studies have assessed self-care practice in adults with type 2 diabetes in Ethiopia, we know little whether these practices differ between those who have and don't have comorbid peripheral neuropathy. The purpose of this study is therefore, to compare diabetes self-care practices in adults with type 2 diabetes who have and don't have comorbid peripheral neuropathy. This study also assessed factors associated with diabetes self-care practices in type 2 diabetes adults with and without comorbid peripheral neuropathy.

1.1.3 Significance of the study

The results of this study will help to providing baseline data on diabetes self-care practices in type 2 DM adults with and without neuropathy in selected governmental hospitals in Addis Ababa. The result will also help to identify variables associated with diabetes self-care practices among type 2 DM adult with and without neuropathy. Also, the findings of this study will be used as evidence base for improving practice by health professionals, policy makers, health officials, non-governmental organizations, and other concerned bodies to enhance health status and quality care of DM patients. The findings will also provide baseline data for future interventional studies in nursing.

CHAPTER II

1.2 Literature Review

1.2.1 Self-care practice review

Across-sectional study conducted in Malawi shows that self-care practice was 33% among diabetes patients(23). while a study from United Arab Emirate shows that only 37.7% the participants had good self-care practice (24). A study conducted in Romania reveals that quality of diabetes self-care is low in patients with neuropathy than none neuropathy(25). And according to cross-sectional study from West India self-care activities were 25.6% prevalent (26).

According to study conducted in Jimma only 49.1% of the participant performed diabetes self-care practice(20).The study also showed that diabetes Self-care practices were significantly associated with level of education, family history of DM, in which respondents with lower educational level have poor self-care practice than higher education level (AOR=3.1, 95%CI: 1.7, 5.8), and participant who had family history of DM had better self-care practice than other (AOR=0.5, 9%CI: 0.3-0.9).

Studies have also revealed that diabetes self-care practices in Bihar-Dar, Addis Ababa, and Benishangul-Gumze were 28.4% , 55.6% and 54.3% respectively (27–29).According to this study patients not having a glucometry, poor diabetes knowledge, poor diabetes self-efficacy, and no social supports were associated to poor self- care practice.

According to a cross-sectional study conducted in Gondar the prevalence of poor self-care practice among diabetes patients was 51.86%(30) .In this study, living in rural area (AOR = 3.33; 95% CI 1.61–6.88), having social support (AOR = 0.31; 95% CI 0.15–0.62), low income (AOR = 2.16; 95% CI 1.17–3.98) were significantly associated with poor diabetes self-care practice. According to a cross-sectional study conducted in Nek met diabetes self-care practices were 60.7%(31).The study showed that, poor self-care practices were more

likely to occur among male patients (AOR = 5.551, 95% CI = 2.055–14.997, $p = 0.001$), patients living in rural area (AOR = 5.517, 95% CI = 2.184–13.938, $p < 0.001$), patients with duration of diabetes < 6 years (AOR = 41.023, 95% CI = 7.373–228.257, $p < 0.001$), patients with poor knowledge about diabetes (AOR = 67.917, 95% CI = 8.212–561.686, $p < 0.001$).

1.2.1.1 Diet related practice

According to cross-sectional study in Sri Lanka, 56.6% of diabetes patients not followed healthy diet (fruits and vegetables, less meat and dairy products) recommendation for 3 or more days a week. In this study diet were highly associated with FBS(22). Another study conducted in Malawi shows that 57.28% of the participants followed general diet 6–7 days per week but none of the participants reported taking fruits and vegetables per day(23). A cross-sectional study in Bangladesh also revealed that 44.8% of diabetes patients were not adherent to recommended diet(32).

An institutionalized based cross-sectional study conducted in Romania revealed that diabetes self-care practices were decreased in patients with neuropathy than diabetes patients without neuropathy (25). According to qualitative study conducted in Addis Ababa, diabetes self-care practice is poor even though most participant have totally avoided taking table sugar and minimized sweet drinks and foods, income were associated(33). None of the participants reported a meal plan that considers their diabetes. Another cross-sectional study shows that in the same area only 75.9% and 83.5% diabetes patients did not adhere to the recommended diet, marital status, monthly income and age are positively associated(21,26,34). According to cross-sectional study conducted in Nek met, only 69.4% of diabetes patient followed adequate dietary plan(31).

1.2.1.2 Exercise

A study conducted in Romania shows that physical exercise was low in diabetes patients with neuropathy than non-neuropathy which is (5 points vs. 6 points; $P=0.002$)(25). An institutional based cross-sectional study conducted in Sri Lank revealed that 55.3% of participant

performed exercise for 30 minutes 3 or more days per week, while 23.7% did not perform exercise even for 1 day per week(22). According to this study age was significantly associated with physical exercise in which those aged ≤ 49 years had good physical activity than those aged ≥ 50 years. (OR = 2.46, 95% CI = 1.37 - 4.44, p = 0.002).

A cross-sectional study conducted in Lebanon shows that 15.9% of diabetes patients perform physical activity(34). Another study conducted in Bangladeshi reported that 33.2% were not adherent exercise(32). While a study conducted in Malawi revealed that 77% of diabetes patient performed physically activity for at least 30 minutes more than three days (23).

Another study in Romania revealed that physical exercise is low in diabetes patients with neuropathy than diabetes patients without neuropathy (25). A qualitative study conducted in Addis Ababa reported that all participants do not perform exercise regularly(33). But, across-sectional study in the same area shows that 53% diabetes patients perform physical activity ,sex, marital status, occupation, level of education and duration of DM were associated with exercise(26,28). The same study also described that marital status, monthly income, and educational level were significantly associated with physical exercise. An institutionalized based cross-sectional study conducted in Nek met revealed that 63.5% of diabetes patient performed adequate exercise (31).

1.2.1.3 Blood glucose monitoring

According to studies conducted Australia and North Carolina self-monitoring blood glucose (SMBG) were prevalent in 15% and 45% of diabetes patients (35,36). Another study revealed that self-monitoring of blood glucose (SMBG) in Sri Lank was poor in that 60.3% of the diabetes patient did not measure blood glucose even a single day per week (22). While a cross-sectional study conducted in Bangladeshi shows that non-adherence to 'blood glucose monitoring was around 37% prevalent(32). While a study in United Arab Emirates shows that only 41.7% always test blood glucose, 11.9% test sometimes, and 24% never test (24).

Another study in Romania revealed that diabetes self-monitoring practices was decreased in patients with neuropathy than diabetes patients without neuropathy(25).A qualitative study conducted in Addis Ababa revealed that all participants were not measuring their blood glucose regularly(33).Another cross-sectional study conducted in the same area revealed that 37% of diabetes patient did not monitor their blood glucose level(37).This study reported that level of education and marital status was significantly associated with self-monitoring of blood glucose level in which patients attained primary education were less likely to monitor blood glucose than those educated at tertiary educational level. A cross-sectional study conducted in similar area also shows that 83.5% diabetes patient did not adhere to self-monitoring of blood glucose level marital status and occupation were associated(21).This study shows that patients who were unemployed, more likely to practice blood glucose monitoring than merchants(AOR [95% CI] =2.4 [1.3–5.9]). An institutional based cross sectional study conducted in Nek met hospital in 2019adequate diabetes self-blood glucose testing was 15% which is similar to Australian 15% (31,35).

1.2.1.4 Foot care

A cross-sectional studies conducted in Sri Lanka showed that 49.7% diabetes patient did not perform foot care (Checked feet, wash feet, soak feet) even a single day in a week (22). Another study in Lahore shows that only 14% of respondents had good practices for foot care (38).

Studies have shown that in Bangladeshi 43.2% of diabetes patients did not adhere to foot care (32).but in Malawi 69% were checking their feet every day and inspecting inside their shoes, foot care practice were associated with social support(23,26).And in Tanzania only 37.9 % of the participants foot self-inspection was done regularly (39). Another study in Sudan revealed that half of the patients who had foot ulcers and more than 56% of the patients with feet numbness, tingling and needles sensation or itching, had poor self-care practice, 25% had moderate practice, and the remaining 18.2% had good practice(40).A study from Romania also reported

that diabetes foot-care practices were decreased in patients with neuropathy than diabetes patients without neuropathy(25).

According to a qualitative study conducted in Addis Ababa regular foot care was the least recognized self-care practice by the study participants and many of them reported as foot injury is a common health problems for them(33).An institutional based cross-sectional studies conducted in Ethiopia have shown that adherent to recommended diabetic foot care was 66.6%in Addis Ababa(28),37.4% in Benishangul-Gumze(29), and 82.9% in Nekemete(31).

1.2.1.5 Medication adherence

A study conducted in Malawi showed that 88.66% of study participant were taking their medication everyday as recommended(23). While a study from Bangladesh showed 20% non-adherence to oral hypoglycemic agent 6.6% to insulin(32).A qualitative study conducted in Addis Ababa showed that most of the participant were not take their medication as recommended, level of education and place of residency were associated with medication adherence(33).Another study in the same area shows that 4.3% patients did not adhere to the prescribed medications(21). whereas a study conducted in Jimma reveled that24.9 % had low, and 37.2 % had high level of adherence to medications, level of education were associated with medication adherent(20). The latter study described that respondents within the adult age group were more likely to adhere to their medication than older aged (AOR [95% CI] =11 [1.03–13.6]). A crosssectional study conducted in AA shows medication adherence was low, place of residency and level of education were significantly associated with medication adherence(37).

1.2.1.6 Smoking

There is too little study related to smoking in diabetes patients. A cross-sectional study in Bangladesh revealed that 37.2% diabetes patients were not smoking cigarette(32).

1.2.2 Conceptual Frame Work

This study adapted the Theory of Diabetes Self-Care Management (TDSCM) as a conceptual framework(41).The TDSCM postulates that personal and environmental factors can influence an individual’s engagement in self-care practices and patient outcomes involving glycemic control and development of co morbidities including peripheral neuropathy. The diagram shows the proposed relationship between diabetic personal (Sociodemographic, psychosocial, and clinical) factors and environmental factors with self-care practices in type 2 diabetes adults with and without comorbid peripheral neuropathy in this study.

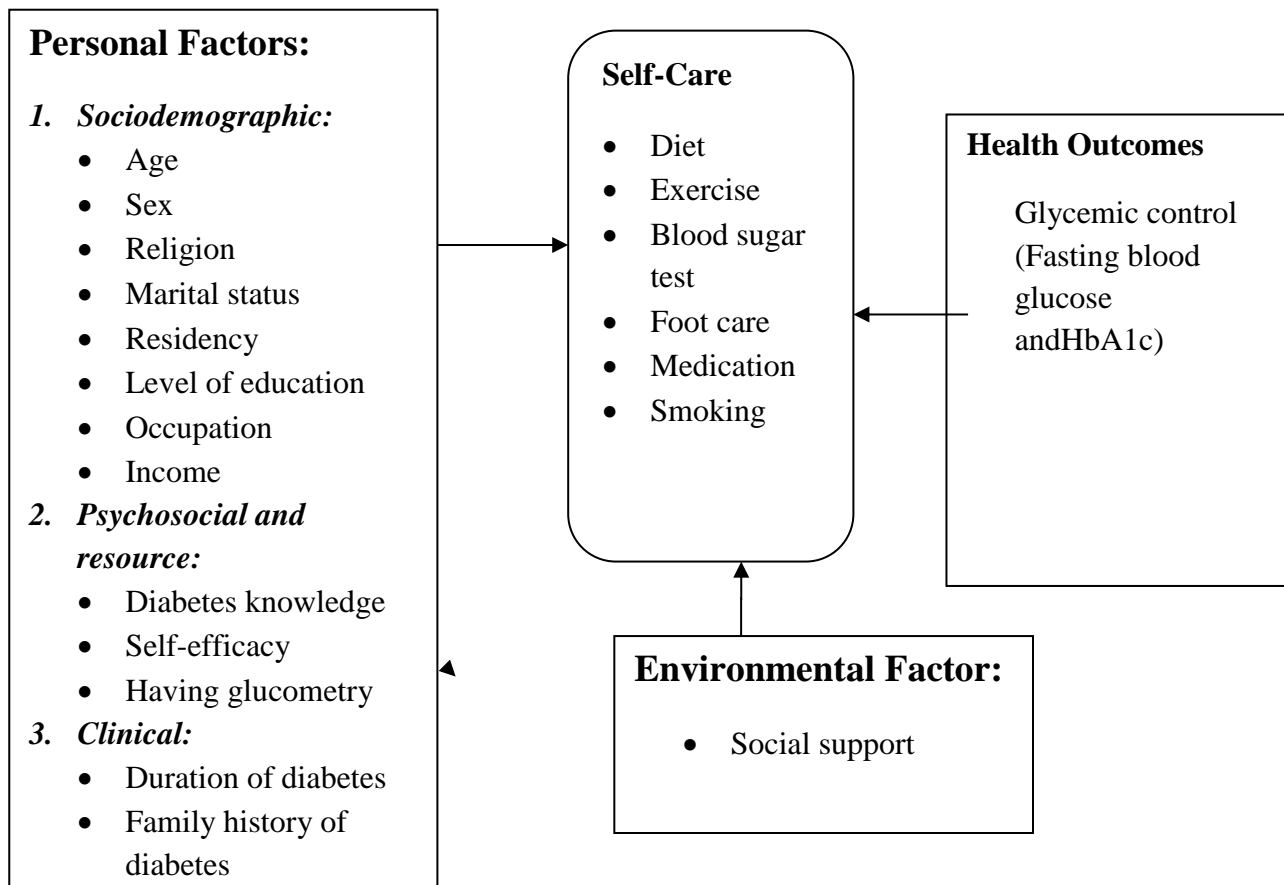


Figure 1: Conceptual framework for the study of self-care practice in type 2 diabetes adults with and without comorbid peripheral neuropathy in governmental hospitals in Addis Ababa

CHAPTER III

1.3 OBJECTIVES

1.3.1 General objective

The general objective of this study is to determine self-care practice among type 2 diabetes adults with and without comorbid peripheral neuropathy, Addis Ababa, 2019/2020.

1.3.2 Specific objectives:

- To compare self-care practices among type 2 diabetes adults with and without comorbid peripheral neuropathy.
- To identify factors associated with self-care practices among type 2 diabetes adults with and without comorbid neuropathy

CHAPTER IV

1.4 Methods and Materials

1.4.1 Study area and period

Addis Ababa is the capital city of Ethiopia, with a population of around 3.4 million according to the 2013 Population Projection of Ethiopia (42). Its area is estimated to be 530 Km² with altitudes ranging from 2200 to 3000 meter above sea level, average temperature of 22.8°C and average rainfall of 1,180.4 mm. Addis Ababa has a total of 51 hospitals from this 11 of them are governmental hospitals, while 40 are nongovernmental. Setting of study was at TASH, St. Paul specialized hospital and Zewditu memorial hospital selected by lottery method among Addis Ababa governmental hospital which has an average monthly type 2 diabetes patient flow of 421, 310 and 50 respectively. The studies were conducted from November 15- April 15/2020.

1.4.2 Study design

Institutional based cross-sectional study had been used.

1.4.3 Sources Population

The sources population of the study was all type 2 DM patients in Addis Ababa.

1.4.4 Study Population

The study population was all patients with type 2 DM attending diabetes units in selected hospitals during data collection time.

1.4.5 Eligibility Criteria

1.4.5.1 Inclusion Criteria

Persons with the following characteristics had been included in this study:

- Type 2 DM patients who are 18 years old or above.

- Those who lived with type 2 DM for at least 6 months since diagnosis

1.4.5.2 Exclusion Criteria

Persons with the following characteristics had been excluded:

- Type 2 diabetes patient who were critically sick
- Those with hearing and/or visual problem
- Those who were not willing to participate

1.4.6 Sample Size Calculation and Sampling Procedure

The sample size (n) had been calculated using the sample size calculator of Epi-Info 7 for the Cross-Sectional Studies (Exposed and unexposed) module. The following assumptions were considered in the sample size calculation: two-sided confidence level of 95% or 0.05, statistical power of 80%, percent outcome in exposed group = 52.2% and adjusted odds ratio of 2.4(43). This is appropriate since the study was designed to estimate the proportion of the self-care practice in type 2 diabetes adults with and without comorbid peripheral neuropathy. Thus, the calculated sample size 198 total (99 with neuropathy and 99 without neuropathy). After adding a 10% contingency to compensate for potential non response the final sample size was 218, meaning 109 of those with comorbid neuropathy and 109 of those without neuropathy.

1.4.7 Sampling Procedure

The study subject was selected using a proportional allocation depicted in the table below.

Table 1: Proportional allocation of study samples

Hospital	Total Population	With neuropathy	No neuropathy
TASH	421	59	59
SPHMMC	310	43	43
Zewditu memorial	50	7	7

Hospital			
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The study participant had been selected by every 3 patients.

1.4.8 Study Variables

1.4.8.1 Dependent Variable

- Self-care practice with peripheral neuropathy
- Self-care practice without Peripheral neuropathy

1.4.8.2 Independent Variables

Personal factors

Socio-demographic variables

- Age of the patient
- Sex (male, female)
- Religion
- Marital status
- Education level (no education, primary, secondary, diploma and above)
- Occupation (governmental, non-governmental, no job)
- Monthly income
- Residency

Psychosocial and resource variables:

- Diabetes knowledge
- Self-efficacy
- Having glucometry

Clinical variables:

- Duration of diabetes

- Family history of diabetes
- FBGL
- HGBA1C

Environmental factor

Social support

1.4.9 Operational Definition

- **Diabetes self-care practices:** had been measured by recording how many days the participants performed the recommended self-care behaviors (diet, exercise, self-monitoring of blood glucose, foot care, medication adherence, and not smoking) in the past seven days. The higher the score indicates better diabetes self-care practice.(44)
- **Diabetes neuropathy:** is peripheral nerve pain related to diabetes mellitus complication when the Michigan neuropathy test result is ≥ 4 from 15 points (45)

1.4.10 Data Collection Tools

Data was collected by using semi- structured questionnaire, and by using Michigan neuropathy screening instrument (MNSI). The questionnaire was adapted from(45) different literature with modification. The investigator had developed the questionnaire for face to face interviews with diabetic patients and document review (such as HGBA1C, FBS). The questionnaire consists of five parts: socio-demographic items, psychosocial items (diabetes knowledge and self-efficacy), environmental (social support) items, diabetes self-care practice items, and items for clinical factors. The measurement tools were described below.

- **Sociodemographic factors:** the Sociodemographic variables such as age and gender had been measured using 8 individually self-contained items.
- **Low monthly income:** participants who had 2970Ethiopian birr and less/month
- **High monthly income:** participants who had > 2971 Ethiopian birr/month.

- **Diabetes self-care practice:** the Summary of Diabetes Self-Care Activities (SDSCA) had been used to measure the self-care practices of the participants (44). The scale had a core set of 11 items used to measure the diabetes self-care behaviors of diet, exercise, self-monitoring blood glucose, foot inspection, and smoking. In addition, it consists of 1 item for medication adherence measurement, totaling to 12 items for the present study. Participants report how many days in the previous week they had engaged in a particular self-care activity and scores had been calculated for each dimension. Score of 7 for self-monitoring of blood glucose and medication adherence and higher score in the other dimensions show better diabetes self-care practice.
- **Peripheral neuropathy:** The first part of the Michigan Neuropathy Screening Instrument (MNSI) had been used to assess for the presence of diabetic neuropathy(45). The instrument consists of 15 self-reported ‘yes’ or ‘no’ questions on foot sensation including pain, numbness and temperature sensitivity. Responses were added to obtain the total score. Response of ‘yes’ to items 1-3, 5-6, 8-9, 11-12, and 14-15 were each counted as one point. A ‘no’ response on items 7 and 13 counts as 1 point each. Item #4 that measures impaired circulation and item #10 that measure general anesthesia counted 1 point each. A score ≥ 4 from the total score 15 was considered abnormal(45).
- **Diabetes knowledge:** The general knowledge segment of the revised Michigan Diabetes Knowledge Test (DKT2) were used to measure the participants' knowledge of diabetes(46). The instrument is scored based on the percent of questions answered correctly. The general segment of DKT2 consists of 14-item but due to lack of relevance in the Ethiopian context item number 4 was omitted in the present study, making a total of 13 items. The revised DKT2 has adequate reported reliability with a Cronbach’s alpha of 0.71.
- **Diabetes self-efficacy:** The Perceived Diabetes Self-Management Scale (PDSMS) had been used to measure the participant’s diabetes self-efficacy(47).

The PDSMS is an 8-item tool with responses which involving 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The total score had range from 8 to 40, with higher scores indicating more confidence in self-managing one's diabetes.

- **Social Support:** The ENRICHD social support instrument (ESSI) had been used to measure the participant's perceived social support(48).The ENRICHD Social Support Instrument (ESSI) is a 7-item self-report survey that assessed perceived social support and had been used with a number of cardiovascular populations. cut off points the first 6 items use a 5-point likert scale ranging from 1 = none of the time to 5 = all the time. The 7th item is a yes/no question, scored 4 for yes and 2 for no. Total score ranges from 8 to 34. Higher score indicates better perceived social support.
- **Glycemic control** :the recommended glycemic control target by the American Diabetes Association had been used as cut off point in this study. Accordingly the cutoff point for HbA1c is below 7 mg/dl / and FBS below 126 mg/dl is normal(49).

1.4.11 Data Collection Procedure

Data was collected by 5 nurses and 1 Nurse (supervisor) who were trained about Diabetes self-care practice and diabetes peripheral neuropathy screening test and who were working in clinical area out of diabetes clinic. Those patients who attend diabetic clinic and fulfill the inclusion criteria was undergo Diabetes self-care practice examination and Diabetes peripheral neuropathy screening test. Some biographical data was collected from patient chart.

1.4.12 Data Quality Control

To ensure quality of the data, the questionnaire was examined by senior experts to the area of study for content validity and pretest was done on 5% of total population at Yekatit12 hospital. Any error found during expert evaluation and pretest had been corrected and modification was made into the final version of the data collection questionnaire. The tool the questionnaire was first translated from English to Amharic then back to English to ensure the accuracy of the Amharic version of the questionnaire. Training had been given to data collectors and

supervisor for two days before actual data collection task and training guide had been prepared to facilitate the training. Data quality had been controlled by designing proper data collection materials, through continuous supervision. All complete data collection forms had been examined for completeness and consistency during data management, storage, cleaning and analysis. The data had been entered and cleaned by principal investigator before analysis. Five nurses, who were received Diabetes self-care practice test and Diabetic peripheral neuropathy examination training, had been collected the data. The principal investigator of the study had controlled the overall activity.

1.4.13 Data Processing and Analysis

The collected data had been cleaned and checked for any missing and inconsistency, and then it had been entered into SPSS version 26. Both Descriptive and Analytic statistics had been performed to identify the distribution of socio-demographic characteristics and diabetic self-care behavior of the study participant's linear regression analysis had been performed to compare self-care with and without comorbid neuropathy. To control confounding effect those variables having $p\text{-value} < 0.25$ in the simple linear regression had been included in the multiple linear regression analysis. Multiple linear regression had been used to assess self-care practice $p\text{-value}$ below 0.05 with 95% confidence interval had been used to determine the statistical significance of association between variables.

1.4.14 Ethical Consideration

Ethical clearance and approval had been obtained from the Institutional Review Board (IRB) of the College of Health Sciences of Addis Ababa University. Official letter had been obtained from Department of Nursing and Midwifery to the study settings. After explaining the purpose and possible benefit of the study, written informed consent had been obtained from each participant before starting the data collection. The confidentiality had been maintained in each level of the project work in this study. For the purpose of confidentiality, the names and any personal identifier of the participants had not been recorded but code number had been used. The study

participants had been informed about their rights to refuse his or her participation, ask any question or withdraw at any time during data collection process.

1.4.15 Dissemination of the Result

The findings of this study had submitted and present to Addis Ababa University School of Nursing and Midwifery. The result also will disseminate to TASH, SPHMMC and Zewditu memorial hospital diabetic clinic. The findings will be published on reputable peer reviewed journal. Hard and soft copies will be available in the library of AAU.

CHAPTER V

1.5 RESULT

1.5.1 Socio-demographic characteristics of the participants

A total of 216 participants were included in the study with the response rate of 99.1% and from this 111(55.4%) were female. The mean age of the participants was 57.9 ± 12.6 years, and 114(66.5%) were married, 160(74.1%) were follower of orthodox Christian religion, 62(28.7%) attended secondary school education, 202(92%) were urban residents, 60(27.8%) were house wife and 129(59.7%) had low monthly income (Table 1).

Table 2: Socio-demographic characteristics of self-care practice in type 2 DM adult with and without comorbid peripheral neuropathy Addis Ababa public Hospitals, Addis Ababa, Ethiopia, 2020

Variables	Category	Frequency	Percent (%)
Sex	Male	105	48.6
	Female	111	55.4
Age	18 to 29	5	2.3
	30 to 49	42	19.4
	50 to 64	99	45.8
	65 to 70	45	20.8
	71 and more	25	11.6
Marital status	Married	142	65.7
	Single	8	3.7

	Divorced	14	6.5
	Widowed	52	24.1
Religion	Orthodox	160	74.1
	Muslim	30	13.9
	Protestant	23	10.6
	Catholic	2	0.9
	Others	1	0.5
Level of education	Unable to read and write	36	16.7
	Read and write	24	11.1
	Primary	30	13.9
	Secondary	62	28.7
	Diploma	35	16.2
	Degree and Above	29	13.4
Place of residence	Urban	202	93.5
	Rural	14	6.5
Occupation	Civil servant	31	14.4
	Farmer	14	6.5
	Self-employed	40	18.5
	Student	1	0.5
	Merchant	8	3.7

	Housewife	60	27.8
	Daily laborer	5	2.3
	Others (retirement)	57	26.4
Monthly	Low	129	59.7
Income	High	87	40.3

1.5.2 Clinical related variables of self-care practice in type 2 DM adult with and without comorbid peripheral neuropathy

In this study 108 (50%) of the respondent had family history diabetes mellitus, 130 (60.2%) had glucometry, 140(64.8) had FBSL of greater than 126 mg/dl, 154 (71.3%) had HA1C of greater or equal to 7%, and 88(40.7%) lived with DM for greater or equal to 11 years (Table 2).

Table3: Clinical related factors of self-care practice in type 2 DM adult with and without comorbid peripheral neuropathy Addis Ababa public Hospitals, Addis Ababa, Ethiopia, 2020

Variables	Characters	Frequency	Percent (%)
Family history	Yes	108	50.0
	No	108	50.0
Glucometry	Yes	130	60.2
	No	86	39.8
FBSL	125 and less	76	35.2
	126 and more	140	64.8

HA1c	6 and less	62	28.7
	7 and more	154	71.3
Duration of DM	6 and les	69	31.9
	7 to 10	59	27.3
	11 and more	88	40.7

1.5.3 Difference in self-care practice between type 2 diabetes adults with and without comorbid neuropathy

There is a significant mean difference with regard to diet self-care practice, exercise self-care practice, foot self-care practice and glucose self-care practice among patients with and without peripheral neuropathy at P-value <0.05 and 95% CI..

Table 4: Mean difference of self-care practice in type 2 DM adult with and without comorbid peripheral neuropathy Addis Ababa public Hospitals, Addis Ababa, Ethiopia, 2020

Dependent variable	Mean Difference	Std. Error Difference	p-value	95% Confidence Interval	
				Lower	Upper
diet self-care practice	2.40741	.60466	.000*	1.215	3.599
exercise self-care practice	1.97222	.45785	.000	1.069	2.874
foot self-care practice	1.27778	.46794	.007	.3554	2.200
glucose self-care practice	1.57407	.46898	.001	.6496	2.498

Medication adherence	.157	.143	.272	-.125	.439
smoking cigarette	.02778	.02414	.251	-	.0753
				.0198	5
				0	

1.5.4 Association of variables with self-care practice among type 2DM adult with and without comorbid peripheral neuropathy

1.5.4.1 Diet self-care practice

In multiple linear regression analysis FBS, and social support were significantly associated with diet self-care practice among patients without peripheral neuropathy at P-value <0.05 and 95%CI.

Dietary self-care practice decreases by 0.022 units for every 1 mg/dl FBS level increase, self-care practice ability increases by 0.228 units for every 1 unit increase in social Support score. Social support and daily laborer were significantly associated with dietary self-care practice among patients with peripheral neuropathy at P-value <0.05 and 95%CI.

For patients with peripheral neuropathy, diet self-care practice ability increases by 0.197 units for every 1 unit increase in social support score. Compare to other occupational groups type 2 diabetes patients with peripheral neuropathy who were daily laborers had lower dietary self-care practice

Table5: Multiple linear regression analysis of factors associated with dietary self-care practice among type 2 DM Patients with and without comorbid peripheral neuropathy Addis Ababa public Hospitals, Addis Ababa, Ethiopia, 2020

Model	B	Standard Error of B	Beta (β)	t	p-value	Co linearity statistics	
						Tolerance	VIF
Without peripheral neuropathy							
Constant	8.235	6.843		1.203	.232		
FBS	-.022	.010	-.214	-2.088	.040	0.702	1.424
social support	.228	.107	.245	2.126	.036	0.556	1.800
With peripheral neuropathy							
Constant	12.947	4.873		2.657	.009		
social support	.197	.065	.263	3.023	.003	0.591	1.692
Occupation - Daily laborer	-7.654	3.314	-.170	-2.310	.023	0.827	1.210

Abbreviations: Variance inflation factor

1.5.4.2 Factors associated with exercise self-care practice among type 2 DM adult with and without comorbid peripheral neuropathy

In multiple linear regression analysis, housewife and others occupational group were significantly associated with exercise self-care practice among type 2 diabetes patients without peripheral neuropathy at P-value <0.05 and 95%CI.

Exercise self-care practice was lower among housewife compared to non-housewife occupational groups.

Diploma level of education, being civil servant and self-employed were significantly associated with exercise self-care practice among patients with peripheral neuropathy at P-value <0.05 and 95%CI. Compared to those with other educational level type 2 diabetes patients with peripheral neuropathy who were with diploma level of education had higher

exercise self-care practice. Similarly, compared to other occupational groups those who were civil servants and self-employed had higher exercise self-care practice.

Table6: Multiple linear regression analysis of factors associated with exercise self-care practice among type 2 DM adult with and without comorbid peripheral neuropathy Addis Ababa public Hospitals, Addis Ababa, Ethiopia, 2020.

Model	B	Standard Error of B	Beta (β)	T	p-value	Co linearity statistics Tolerance	VIF
Without peripheral neuropathy							
Constant	8.762	2.740		3.198	.002		
Occupation – Housewife	-2.829	1.120	-.378	-2.526	.013	0.259	3.866
Occupation – Others	-2.384	1.083	-.282	-2.201	.030	0.354	2.825
With peripheral neuropathy							
Constant	2.844	4.338		.655	.514		
Level of education - Diploma	2.681	.933	.298	2.873	.005	0.629	1.589
Occupation - Civil servant	3.843	1.148	.385	3.348	.001	0.503	1.987
Occupation - Self-employed	2.189	1.017	.226	2.152	.034	0.615	1.625

Abbreviations: Variance inflation factor

1.5.4.3 Factors associated with foot self-care practice in type 2 DM adult with and without comorbid peripheral neuropathy

In multiple linear regression analysis, male sex was significantly associated with foot self-care practice among patients without peripheral neuropathy at P-value <0.05 and 95%CI. Men compared to women without peripheral retinopathy had lower foot self-care practice

In patients with peripheral neuropathy social support and parent history of DM were significantly associated with foot self-care practice at P-value <0.05 and 95%CI. Foot self-care

practice increased by 0.135 unit with 1 unit increase of social support score whereas foot self-care practice was lower among those patients who had family history of DM compared to those without family history of DM.

Table7: Multiple linear regression analysis of factors associated with foot self-care practice among type 2 DM Patients with and without comorbid peripheral neuropathy Addis Ababa public Hospitals, Addis Ababa, Ethiopia, 2020.

Model	B	Standard Error of B	Beta (β)	T	p-value	Co linearity statistics	
						Tolerance	VIF
Without peripheral retinopathy							
Constant	6.274	3.994		1.571	.120		
Male sex	-1.546	.647	-.245	-2.390	.019	0.702	1.426
With peripheral retinopathy							
Constant	14.737	5.783		2.548	.012		
social support	.135	.061	.212	2.225	.029	0.739	1.353
Family history of DM	-2.049	.644	-.277	-3.181	.002	0.881	1.135

Abbreviations: Variance inflation factor

1.5.4.4 Variables associated with SMBGL self-care practice among type 2 DM adult with and without comorbid peripheral neuropathy

In multiple linear regression analysis, Muslim religion, being student by occupation and having glucometry at home were significantly associated with SMBGL practice among patients without peripheral neuropathy at P-value <0.05 and 95%CI.

In multiple linear regression analysis social support, being in marriage, civil servant and having glucometry at home were significantly associated with SMBGL practice among patients with peripheral neuropathy at P-value <0.05 and 95%CI.

Table8: Multiple linear regression analysis of factors associated with SMBGL practice among type 2 DM with and without comorbid peripheral neuropathy Addis Ababa public Hospitals, Addis Ababa, Ethiopia, 2020.

Model	B	Standard Error of B	Beta (β)	t	p-value	Co linearity statistics	
						Tolerance	VIF
Without peripheral retinopathy							
Constant	-1.311	3.399		-.386	.701		
Religion–Muslim	2.527	1.225	.223	2.063	.042	0.535	1.870
Occupation–Student	8.457	3.432	.213	2.464	.016	0.835	1.194
Have glucometry home	2.284	.755	.287	3.026	.003	0.697	1.435
With peripheral retinopathy							
Constant	-1.007	2.605		-.386	.700		
Social support	.101	.050	.192	1.997	.049	0.720	1.389
Being in marriage	-1.884	.599	-.299	-3.147	.002	0.740	1.352
Occupation - Civil servant	1.614	.754	.180	2.141	.035	0.943	1.060
Having glucometry at home	1.552	.564	.256	2.753	.007	0.771	1.297

Abbreviations: Variance inflation factor

1.5.4.5 Factors associated with medication intake practice among type 2 DM adult with and without comorbid peripheral neuropathy

In multiple linear regression analysis, there were no variables significantly associated with medication self-care practice among patients without peripheral neuropathy at P-value <0.05 and 95%CI. However, primary level of education was significantly associated with medication self-care practice among patients with peripheral neuropathy at P-value <0.05 and 95%CI.

Table 9: Multiple linear regression analysis of factors associated with medication self-care practice among type 2 DM adult with and without comorbid peripheral neuropathy Addis Ababa public Hospitals, Addis Ababa, Ethiopia, 2020.

Model	B	Standard Error of B	Beta (β)	T	p-value	Co linearity statistics	
						Tolerance	VIF
With peripheral retinopathy							
Constant	4.639	1.866		2.485	.015		
Level of education –Primary	-.765	.311	-.252	-2.465	.016	0.761	1.314

1.5.4.6 Factors associated with smoking self-care practice in type 2 DM adult with and without peripheral neuropathy

In linear regression analysis, there was no variables significantly associated with smoking self-care practice among patients without and with peripheral neuropathy at P-value <0.05 and 95%CI.

CHAPTER VI

1.6 Discussion

According to this study finding there were self-care practice differences among type2 DM patients with and without comorbid peripheral neuropathy. Which is diet; exercise, foot care, and SMBGL practice were better in respondent without peripheral neuropathy than with peripheral neuropathy. This finding was similar with the study conducted Romania (25).

This might be due to patients with pain could not perform exercise, could not accesses diabetes related preferred diet, forget BGL measurement and due to nerve problem might be reduce foot care.

1.6.1 Diet self-care practice and associating factors without and with peripheral neuropathy:

According to this study, dietary self-care practice were poor for every 1 mg/dl FBSL increase (0.022times), this might be as a result of being reluctant, negligence and lack of awareness about FBSL might the possible reason. Dietary self-care practice were good in without peripheral neuropathy respondents who have social support(0.228times) and diet self-care practice were good in with peripheral neuropathy respondents who have social support (0.197 times) than that have no, this might be due to have social support may had socio economical and other support accesses from their family as well as the community related to their diet preference and individuals who have social support could get better economy and materials needed for diabetes preferred diet, and poor self-care practice, those who were daily laborer (7.654 times) among patients with peripheral neuropathy. This might be as a result of daily laborer were not accessed to get balanced diet due to lack of economy and time

1.6.2 Exercise practice in type 2 DM without and with comorbid peripheral neuropathy

According to this study Exercise self-care practice ability decrease in pts who were housewife and other occupation(2.829, 2.384 times) respectively among without peripheral neuropathy respondents, this might be as a result of working environment of house wife and other occupation were mostly sedentary life style and limited from physical activity.

According to this study Exercise self-care practice ability increase in pts who had diploma educational level (2.681times), this might be due to as level of education increase level of awareness also increase towards exercise, increased by 2.189 units for self-employed respondents with peripheral neuropathy. And being civil servant increase exercise practice (3.843 times) respondents with peripheral neuropathy. This is as a result of being civil servant may perform daily physical exercise including walking and some working area might be suitable to perform physical exercise.

1.6.3 Foot self-care practice among type2 DM Patients without and with peripheral neuropathy

According to this study foot self-care practice ability were decreases by 1.546 units for pts who are male sex of the respondents without peripheral neuropathy. This might be males were poor on sanitation activity and cleaning and washing of their foot care relative to females. According to this study finding foot self-care practice ability increase by 0.135 units of pts who had social support , this might be as a result of participants who had social support can get materials access that were important to foot care and physical support from others. Foot care practice was decrease by 2.049 units of respondents who have parent history of DM pts with peripheral neuropathy. This might be resulted from reluctance and negligence of the respondents.

1.6.4 SMBGL care practice among type 2 DM Patients without and with peripheral neuropathy

According to this study SMBGL practice ability increased by 2.527 units for pts who had Muslim religion, this might be due to other religion followers being neglect. increase by 8.457units for pts who were being student, this might be as a result of mostly being a student might be sensitive to use measuring units and active age of monitoring their health status and Increase by 2.284 units for pts who have glucometry of the respondents without peripheral neuropathy. This might be as a result of easily accessed to measuring equipment to check as ordered.

According to this study finding SMBGL practice ability increase by 0.101units of pts who have social support respondents with neuropathy. This might be due to participants have social support can get monitoring equipment and socials encourage to measure BGL from their supporter than have no social support. Decrease by 1.884 units of pts being married, this might be due to holding more responsibility relatively, increase by 1.614 units of pts who are civil servants and Increase by 1.552unit of pts who have glucometry respondents with peripheral neuropathy. This might be as a result of participants has good income and awareness and having glucometry can check their glucose level as they want respectively.

1.6.5 Medication intake care practice among type 2 DM Patients without and with peripheral neuropathy.

According to this study there was no significantly associated with medication intake practice among patients without peripheral neuropathy at P-value <0.05 and 95%CI.

According to this study finding medication intake practice ability decrease by 0.765 units of patients who had primary level of education respondents with peripheral neuropathy, this might be due to as a result educational level decrease level of awareness and practice decrease relative to secondary educational level and other higher educational level

Smoking practice among type 2 DM Patients without and with peripheral neuropathy.

There was no significantly associated with smoking practice among patients without and with peripheral neuropathy at P-value <0.05 and 95% CI.

1.7 Conclusion and Recommendation

1.7.1 Conclusion

According to this finding Type 2 DM patients without peripheral neuropathy have good diet, exercise, foot care, and SMBGL practice than with peripheral neuropathy, but there were no difference in medication intake and smoking practice b/n type 2 DM patients with and without peripheral neuropathy Variables of being married, social support, glucometry, parent history of DM, FBS diploma degree and status, civil servant and daily laborer and self-employ were statistically associated most of self-care practices in type 2 DM with and without peripheral neuropathy.

1.7.2 Recommendation

Addis Ababa public hospitals

- Health care providers should give special consideration which is provide measuring equipment, create awareness about self-care practice to patients and patients family to type 2 DM patients, with peripheral neuropathy, being married marital status, primary educational level, had high FBS, male , had no glucometry and social support cases.

Researchers

- Researchers should furthermore investigate using both qualitative and quantitative study to allow deeper understanding
- Researches should also do by changing the design to detect cause and effect relationship of variables.

1.8 Strength and weakness

1.8.1 Strength

- Standardized tool used as mentioned in data collection tool section
- Analyzing many independent variable with six dependents variables each by each

1.8.2 Weakness

- Cross-sectional study design, which was not indicate cause and effect relationship of variables
- Bulky number of questions in the questionnaire tool make respondents so reluctant

REFERENCES

1. Abbas AH, Abas AH. Prevalence and associated risk factors for type 2 diabetes mellitus among adults (≥ 40 years of age) in jigjiga City, Somali region, Eastern Ethiopia. 2019;6(January). Available from: www.jetir.org
2. Mariam TG, Alemayehu A, Tesfaye E, Mequannt W, Temesgen K, Yetwale F, et al. Prevalence of Diabetic Foot Ulcer and Associated Factors among Adult Diabetic Patients Who Attend the Diabetic Follow-Up Clinic at the University of Gondar Referral Hospital, North West Ethiopia, 2016: Institutional-Based Cross-Sectional Study. *J Diabetes Res.* 2017;2017.
3. Status C. Self- Care Practices and Associated Factors among Adult Diabetic Patients in Public Hospitals of Dire Dawa Administration , Eastern Ethiopia. :1–22.
4. Juster-switlyk K, Smith AG. Updates in diabetic peripheral neuropathy [version 1 ; peer review : 3 approved]. 2019;5:1–7.
5. Tesfaye S, Boulton AJM, Dyck PJ, Freeman R, Horowitz M, Kempner P, et al. Diabetic neuropathies: Update on definitions, diagnostic criteria, estimation of severity, and treatments. *Diabetes Care.* 2010;33(10):2285–93.
6. Tesfaye S, Boulton AJM, Dickenson AH. Mechanisms and management of diabetic painful distal symmetrical polyneuropathy. *Diabetes Care.* 2013;36(9):2456–65.
7. Cooper HC, Booth K, Gill G. Patients' perspectives on diabetes health care education. *Health Educ Res.* 2003;18(2):191–206.
8. Yuan C, Lai CWK, Chan LWC, Chow M, Law HKW, Ying M. The effect of diabetes self-management education on body weight, glycemic control, and other metabolic markers in patients with type 2 diabetes mellitus. *J Diabetes Res.* 2014;2014.
9. Care D, Suppl SS. Glycemic targets: standards of medical care in Diabetesd2018. *Diabetes Care.* 2018;41(January):S55–64.
10. Barello S, Graffigna G, Vegni E. Patient Engagement as an Emerging Challenge for Healthcare Services: Mapping the Literature. *Nurs Res Pract.* 2012;2012:1–7.

11. Atlas IDF. Idf diabetes atlas. 2019.
12. IDF. IDF diabetes atlas, 9^a edition. 2017;1–150. Available from: www.diabetesatlas.org
13. Gebreyes YF, Goshu DY, Geletew TK, Argefa TG, Zemedu TG, Lemu KA, et al. Prevalence of high bloodpressure , hyperglycemia , dyslipidemia , metabolic syndrome and their determinants in Ethiopia : Evidences from the National NCDs STEPS. 2018;1–18.
14. Muhammad-Lutfi A, Zaraihah M, Anuar-Ramadhan I. Knowledge and Practice of Diabetic Foot Care in an In- Patient Setting at a Tertiary Medical Center. *Malaysian Orthop J.* 2014;8(3):22–6.
15. Sobhani S, Asayesh H, Sharifi F, Djalalinia S, Baradaran HR, Arzaghi SM, et al. Prevalence of diabetic peripheral neuropathy in Iran : a systematic review and meta-analysis. 2014;1–7.
16. S.-a.S. D, S. C, R. C. Individual patient education for people with type 2 diabetes mellitus. *Cochrane Database Syst Rev* [Internet]. 2009;(1). Available from: http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD005268/pdf_fs.html%5Cnhttp://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed9&NEWS=N&AN=2009485765
17. Cani CG, Da Silva Girão Lopes L, Queiroz M, Nery M. Improvement in medication adherence and selfmanagement of diabetes with a clinical pharmacy program: A randomized controlled trial in patients with type 2 diabetes undergoing insulin therapy at a teaching hospital. *Clinics.* 2015;70(2):102–6.
18. Gao J, Wang J, Zheng P, Haardörfer R, Kegler MC, Zhu Y, et al. Effects of self-care, self-efficacy, social support on glycemic control in adults with type 2 diabetes. *BMC Fam Pract.* 2013;14:2–6.
19. Graffigna G, Barello S, Libreri C, Bosio CA. How to engage type-2 diabetic patients in their own health management: Implications for clinical practice. *BMC Public Health.* 2014;14(1).

20. Kassahun T, Gesesew H, Mwanri L, Eshetie T. Diabetes related knowledge, self-care behaviours and adherence to medications among diabetic patients in Southwest Ethiopia: A cross-sectional survey. *BMC Endocr Disord* [Internet]. 2016;16(1):1–11. Available from: <http://dx.doi.org/10.1186/s12902-016-0114-x>
21. Bongor Z, Shiferaw S, Tariku EZ. Adherence to diabetic self-care practices and its associated factors among patients with type 2 diabetes in addis Ababa, Ethiopia. *Patient Prefer Adherence*. 2018;12:963–70.
22. Saumika MAR, Amarasekara TD, Jayasekara R. Diabetes Self-Care Activities and Glycaemic Control among Adults with Type 2 Diabetes in Sri Lanka: A Cross-Sectional Study. *J Biosci Med*. 2019;07(05):99–111.
23. Muula AS, Gombachika BT, Nyirenda MJ. Self-management and its associated factors among people living with diabetes in Blantyre , Malawi : a cross-sectional study [version 1 ; peer review : awaiting peer review] Chimwemwe Kwanjo Banda. 2019;1–10.
24. Al-Maskari F, El-Sadig M, Al-Kaabi JM, Afandi B, Nagelkerke N, Yeatts KB. Knowledge, Attitude and Practices of Diabetic Patients in the United Arab Emirates. *PLoS One*. 2013;8(1):1–8.
25. Timar B, Timar R, Schiller A, Oancea C, Roman D, Vlad M, et al. Impact of neuropathy on the adherence to diabetes-related self-care activities: A cross-sectional study. *Patient Prefer Adherence*. 2016;10:1169–75.
26. Garg S, Paul B, Dasgupta A, Maharana SP. Assessment of self-care activities : A study among type 2 diabetic patients in a rural area of West Bengal Assessment of self-care activities : A study among type 2 diabetic patients in a rural area of West Bengal. 2017;(January).
27. Abate TW, Tareke M, Tirfie M. Self - care practices and associated factors among diabetes patients attending the outpatient department in Bahir Dar , Northwest Ethiopia. *BMC Res Notes* [Internet]. 2018;4–8. Available from: <https://doi.org/10.1186/s13104-018-3874-8>

28. Berhe K, Bayray A, Berhe H. Adherence to Diabetes Self-Management Practices among Type II Diabetic Patients in Ethiopia ; A Cross Sectional Study By. 2013;(January 2019).
29. Chali SW, Salih MH, Abate AT. Self - care practice and associated factors among Diabetes Mellitus patients on follow up in Benishangul Gumuz Regional State Public Hospitals , Western Ethiopia : a cross - sectional study. BMC Res Notes [Internet]. 2018;1–8. Available from: <https://doi.org/10.1186/s13104-018-3939-8>
30. Aschalew AY, Yitayal M, Minyihun A, Bisetegn TA. Self - care practice and associated factors among patients with diabetes mellitus on follow up at University of Gondar Referral Hospital ,. BMC Res Notes [Internet]. 2019;1–6. Available from: <https://doi.org/10.1186/s13104-019-4630-4>
31. Dedefo MG, Ejeta BM, Wakjira GB, Mekonen GF, Labata BG. Self-care practices regarding diabetes among diabetic patients in West Ethiopia. BMC Res Notes [Internet]. 2019;12(1):1–7. Available from: <https://doi.org/10.1186/s13104-019-4258-4>
32. Saleh F, Mumu SJ, Ara F, Hafez MA, Ali L. Non-adherence to self-care practices & medication and health related quality of life among patients with type 2 diabetes: A cross-sectional study. BMC Public Health. 2014;14(1):1–8.
33. Tewahido D, Berhane Y. Self-care practices among diabetes patients in Addis Ababa: A qualitative study. PLoS One. 2017;12(1):1–10.
34. Karaoui LR, Deeb ME, Nasser L, Hallit S. Knowledge and practice of patients with diabetes mellitus in Lebanon: A cross-sectional study. BMC Public Health. 2018;18(1):1–9.
35. Tan MY, Magarey J. Self-care practices of Malaysian adults with diabetes and sub-optimal glycaemic control. Patient Educ Couns. 2008;72(2):252–67.
36. Luo H, Bell RA, Cummings DM, Chen Z. Diabetes preventive care practices in North Carolina, 2000-2015. Prev Chronic Dis. 2018;15(3):1–4.
37. Press D. Adherence to diabetic self-care practices and its associated factors among patients with type 2 diabetes in Addis Ababa , Ethiopia. 2018;(June).

38. Hasnain S, Sheikh NH. Knowledge and practices regarding foot care in diabetic patients visiting diabetic clinic in Jinnah Hospital, Lahore. *J Pak Med Assoc.* 2009;59(10):687–90.
39. Chiwanga FS, Njelekela MA. Diabetic foot: Prevalence, knowledge, and foot self-care practices among diabetic patients in Dar es Salaam, Tanzania - a cross-sectional study. *J Foot Ankle Res* [Internet]. 2015;8(1):1–7. Available from: <http://dx.doi.org/10.1186/s13047-015-0080-y>
40. Abuelgasim M, Mohammed A, Ibrahim N, Rahman A. Knowledge , Attitude , and Practice of Foot Care among Type 2 Diabetic Patients Attending Diabetic Clinic . Al Ribat Teaching Hospital in Sudanese Patients. 2018;6(3):34–53.
41. Valmi D, Jaclene A. Toward a Theory of Diabetes Self-Care Management. 2006;
42. Ababa A. Federal Democratic Republic of Ethiopia Central Statistical Agency Population Projection of Ethiopia for All Regions At Wereda Level from 2014 – 2017. 2017;(August 2013).
43. Jember G, Melsew YA, Fisseha B, Sany K, Gelaw AY. Peripheral Sensory Neuropathy and associated factors among adult diabetes mellitus patients in Bahr Dar , Ethiopia. 2017;1–8.
44. The Summary of Diabetes Self-Care. 2000;23(7):943–50.
45. Manuscript A. NIH Public Access. 2013;29(7):937–44.
46. Fitzgerald JT, Funnell MM, Anderson RM, Nwankwo R, Cde RD, Stansfield RB, et al. Validation of the Revised Brief Diabetes Knowledge Test (DKT2). 2016;42(2):178–87.
47. Perceived Diabetes Self-Management Scale Key Reference Access & Cost Information This scale is free to use without permission and can be imported into your REDCap Project from the REDCap Shared Library Example. 2007;30:2007.
48. Designs T. Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD): Study design and methods Psychosocial intervention. 2000;
49. Care D, Suppl SS. 6 . Glycemic Targets : Standards of Medical Care in Diabetes d 2019. 2019;42(January):61–70.

Annex I: Participant Information Sheet (English version)

Good morning/Good afternoon. This questionnaire is prepared for research work to be conducted on the type 2 diabetes self-care practice adult patients with and without comorbid peripheral neuropathy, Addis Ababa, Ethiopia, 2019/2020. The research proposal is conducted to fulfill the thesis requirement of MSc degree in Adult Health Nursing: Addis Ababa University, School of Nursing and midwifery. Dear respondents, below are questions, which are designed to assess the related factors of diabetic self-care practice. Knowing the related factors will help us at a city level as well as country level to work on the developments of self-care practice. You are selected for you are diabetic patient and your participation depends on your voluntariness only. Although you are sacrificing your time there is no benefit in personal or payment that you get for your participation in this study. But your honest response to these questions will help us to better understand the diabetic self-care practice of patients and will also help as the contribution for the countries level effort to develop trends of self-care practice. You are not required to write your name, and it will never be used in connection with any of the information you provide. We would like to express our heartfelt appreciation for your collaboration and thank you in advance.

In case you need to contact the investigator, you may use the following address:

Name: Mezgebu Godie

Tel: 0946387248

Email: mezgebug12@gmail.com

Annex II: Participant Information Sheet (Amharic version)

ጠና ይስጥልኝ፡፡ ይህ መጠይቅ የተዘጋጀው በአዲስ አበባ ባዮኒቨርሲቲ የነርቪዮት ምህርት ክፍል

በአዋቂ ዎች ጠና እና እንክብካቤ ለድህረ ምረቃ ቃዳግ ሪሶርስ ስኬት ስራ ስለሚከናወነው ለመቆጣጠር የሚያደርጉትን ጥረት እና ስራ ስራዎችን እንዲያቆጣጠሩ የሚያደርጋቸውን ተያያዥ ገዢ ገሮች ለማወቅ የሚሰራ ጥናት ነው፡፡

ክቡር መላላሻችን ከዚህ በታች የስኬት ስራ ስለሚከናወነው ለመቆጣጠር የሚያደርጉትን ጥረት ለማወቅ የሚረዱ የተለያዩ ጥያቄዎች ይገኛሉ፡፡

እነዚህን ሁኔታዎች ማወቅ በአዲስ አበባ ምህንበት አገር አቀፍ ደረጃ

የበሽታውን ስር ጭታለ መግታት ለማድረግ ወጥረት ከፍተኛ የሆነ አስተዋጽኦ ይኖረዋል፡፡ በዚህ ጥናት ላይ ተሳታፊ እንዲሆኑ የተደረገው

የስኬት ስራ ስለሚከናወነው መሆኑን ጥናቱ ላይ የሚሰጡትን ተፈጻሚነት ለማሳደግ ነው፡፡ ምንም እንኳን ኳጊዜ ዎችን መስዋዕት ደርጎ ምንም ዘመን ጥናት ላይ

በመላተፎት በግለሰብ ደረጃ የሚያገኙት ጥቅም ምንም ዘመን ክፍያ አይኖርም፡፡ ሆኖም ግን የእርስዎ ቀና እና ትክክለኛ መልስ ከላይ የተገለጹትን ገሮች ይበልጥ እንድንረዳ የሚያገዝን ሲሆን በተጨማሪ ምስጋና ላይ ደረጃ በሽታውን ለመቆጣጠር

ለሚደረገው ጥረት አስተዋጽኦ ይደርጋል፡፡ ይህ ቃለ መጠይቅ ሚስጥርነትን ተጠበቅቶ ወሲጥ ለሰው ዎች እንዲጽፉ አይፈለግም፡፡ በመሆኑም ለሚያደርጉልን ቀናት ብብር በቅድሚኛ ልብ እና መሰጠት ላይ ነው፡፡

አጥኚውን ማን ጋገር ከፈለጉ ይህንን አድራሻ መጠቀም ይችላሉ፡፡

ስም፡ መዘገብ ቡሳዴ

ስልክ : 251946387248

ኢሜይል : mezgebug12@gmail.com

Annex III: Consent Form (English Version)

I am the participants of the study and I clearly understand the objective, significant of the study and also what is expected from me. I also understand that the name, signatures and all information that I give well-kept and not transferred to other third persons.

Do you agree to participate in this study?

Yes, I agree to participate in the study

No, I don't want to participate in the study

I certify that I have read the above consent procedure to the participant

Name and signature of data collector -----

Date of consent _____

Name of study cite (hospital name) _____

Annex IV: Consent Form (Amharic Version)

እኔ የጥናቱ ተሳታፊ የጥናቱን አላማ እና ጥቅም እንዲሁም እኔ የሚጠበቁትን ነገሮች ተረድቼ አለሁ፡፡ ስለሚለገገው ጥናት ወይም ለሌሎች ሰነድ ወይንም ተላልፎ ወይንም ደግሞ ለጠምተረድ አለሁ፡፡ ስለዚህም ጥናቱ ላይ ለመሳተፍ ፈቃደኛ ነኝ፡፡

የተሳታፊው ፊርማ _____ ቀን _____

የመረጃ ሰብሳቢው ፊርማ _____ ቀን _____

Annex V: Questionnaire (English Version)

Part 1:- Socio-demographic Information

No.	Question	Variables
1	Age	-----
2	Sex	1. Male 2. Female
3	Place of residency	1. Urban 2. Rural
4	Marital status	1. Single 2. Married 3. Divorced 4. Widowed 5. Other _____
5	Religion	1. Orthodox 2. Muslim 3. protestant 4. catholic

		5. other_____
6	Occupation	<ol style="list-style-type: none"> 1. Civil servant 2. Farmer 3. Self-employed 4. Student 5. Merchant 6. Housewife 7. Daily laborer 8. Others
7	Educational level	<ol style="list-style-type: none"> 1. Unable to read and write 2. read and write 3. Primary 4. Secondary 5. Diploma 6. Degree and Above
8	Income	-----ETB/month

Part II: peripheral neuropathy question

Michigan neuropathy screening instrument

A. History (To be completed by the person with diabetes)

Answer the following questions about the feeling in your legs and feet. Say **yes** if you have or **no** if you have not felt.

Part III: Diabetes self-efficacy questionnaire

No.	Question	Strongly disagree agree	disagree	neutral	agree	strongly agree
		1	2	3	4	5

No.	Question	Yes	No
1	Are your legs and/or feet numb?		
2	Do you ever have any burning pain in your legs and/or feet?		
3	Are your feet too sensitive to touch?		
4	Do you get muscle cramps in your legs and/or feet?		
5	Do you ever have any prickling feelings in your legs or feet?		
6	Does it hurt when the bed covers touch your skin?		
7	When you get into the tub or shower, are you able to tell the hot water from the cold water?		
8	Have you ever had an open sore on your foot?		
9	Has your doctor ever told you that you have diabetic neuropathy?		
10.	Do you feel weak all over most of the time?		
11	Are your symptoms worse at night?		
12	Do your legs hurt when you walk?		
13	Are you able to sense your feet when you walk?		
14	Is the skin on your feet so dry that it cracks open?		
15	Have you ever had an amputation?		
	Total score		

1	It is difficult for me to find effective solutions for problems that occur with managing my diabetes.	1	2	3	4	5
2	Find efforts to change things I don't like about my diabetes are ineffective.	1	2	3	4	5
3	I handle myself well with respect to my diabetes.	1	2	3	4	5
4	I am able to manage things related to my diabetes as well as most other people	1	2	3	4	5
5	I succeed in the projects I undertake to manage my diabetes	1	2	3	4	5
6	Typically, my plans for managing my diabetes don't work out well.	1	2	3	4	5
7	No matter how hard I try, managing my diabetes doesn't turn out the way I would like.	1	2	3	4	5
8	I'm generally able to accomplish my goals with respect to managing my diabetes	1	2	3	4	5

Part IV: Diabetes knowledge

No	Question	Choice
1	The diabetes diet is:	a. the way most Ethiopian people eat b. healthy diet for most people c. too high in carbohydrate for most people d. too high in protein for most people
2	Which of the following is highest in carbohydrate?	a. chicken sauce b. cheese c. boiled potato d. Peanut butter
3	Which of the following is highest in fat?	a. Low fat (2%) milk b. Orange juice c. Corn d. Honey
4	A1C is a measure of your average blood glucose level for the past:	a. day b. week c. 6-12 weeks d. 6 months
5	Which is the best method for home glucose testing?	a. Urine testing b. Blood testing c. Both are equally good

6	What effect does unsweetened fruit juice have on blood glucose?	<ul style="list-style-type: none"> a. Lowers it b. Raises it c. Has no effect
7	Which should not be used to treat low blood glucose?	<ul style="list-style-type: none"> a. 3 hard candies b. 1/2 cup orange juice c. 1 cup diet soft drink d. 1 cup skim milk
8	For a person in good control, what effect does exercise have on blood glucose?	<ul style="list-style-type: none"> a. Lowers it b. Raises it c. Has no effect
9	What effect will an infection most likely have on blood glucose?	<ul style="list-style-type: none"> a. Lowers it b. Raises it c. Has no effect
10	The best way to take care of your feet is to:	<ul style="list-style-type: none"> a. look at and wash them each day b. massage them with alcohol each day c. soak them for one hour each day d. buy shoes a size larger than usual
11	Eating foods lower in fat decreases your risk for:	<ul style="list-style-type: none"> a. nerve disease b. kidney disease c. heart disease d. eye disease

12	Numbness and tingling may be symptoms of:	a. kidney disease b. nerve disease c. eye disease d. liver disease
13	Which of the following is usually not associated with diabetes:	a. vision problems b. kidney problems c. nerve problems d. lung problems

Part V: Social support

No	Question	None of the time 1	A little of the time 2	Some of the time 3	Most of the time 4	All of the time 5
1	Is there someone available to whom you can count on to listen to you when you need to talk?	1	2	3	4	5
2	Is there someone available to you to give you good advice about a problem?	1	2	3	4	5
3	Is there someone available to you who show you love and affection?	1	2	3	4	5
4	Is there someone available to help with daily chores?	1	2	3	4	5

5	Can you count on anyone to provide you with emotional support (talking over problems or helping you make a difficult decision)?	1	2	3	4	5
6	Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide in?	1	2	3	4	5
7	Are you currently married or living with a partner?	Yes 1	No 2			

Part VI: Clinical factor

FBS-----

HA1c-----

Duration of diabetes-----

Do you have Family history of DM? 1 yes 2 no

Do you have glucometer? 1 yes 2 no

Part VII: Self-care practice

No.	Diet	No. day per week
1	How many of the last SEVEN DAYS have you followed a healthful eating plan?	0 1 2 3 4 5 6 7

2	On average, over the past month, how many DAYS PER WEEK have you followed your eating plan?	0 1 2 3 4 5 6 7
3	On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?	0 1 2 3 4 5 6 7
4	On how many of the last SEVEN DAYS did you eat high fat foods such as red meat or full-fat dairy products?	0 1 2 3 4 5 6 7
Exercise		
1	On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity? (Total minutes of continuous activity, including walking).	0 1 2 3 4 5 6 7
2	On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?	0 1 2 3 4 5 6 7
Blood Sugar Testing		
1	On how many of the last SEVEN DAYS did you test your blood sugar?	0 1 2 3 4 5 6 7

2	On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health care provider?	0 1 2 3 4 5 6 7
	Foot Care	
1	On how many of the last SEVEN DAYS did you inspect the inside of your shoes?	0 1 2 3 4 5 6 7
2	On how many of the last SEVEN DAYS did you check your feet?	0 1 2 3 4 5 6 7
	Medication	
1	On how many of the last SEVEN DAYS, did you take your recommended diabetes medication?	0 1 2 3 4 5 6 7
	Smoking	
1	Have many days you smoked a cigarette even one puff—during the past SEVEN DAYS?	0 1 2 3 4 5 6 7

Annex VI: Questionnaire (Amharic Version)

ክፍል 1: የተሳታፊዎች አጠቃላይ መረጃ

ተ. ቁ	ጥያቄዎች	አማራጮች	ይለፍ
1	ጾታ	1. ወንድ 2. ሴት	
2	እድሜ	
3	የጋብቻሁኔታ	1. ያገባ 2. ያላገባ 3. የተለያየ 4. የተፋታ 5. የሞተበት (ባት)	
4	ሀይማኖት	1. ኦርቶዶክስ 2. ፕሮቴስታንት 3. ካቶሊክ 4. መስሊም 5. ሌላ ካለ ይግለጹ	
5	የትምህርት ደረጃ	1. ማንበብና መጻፍ ማይችል/ትችል 2. ማንበብና መጻፍ ማችል/ትችል 3. 1ኛ ደረጃ 4. 2ተኛ ደረጃ 5. ዲፕሎማ 6. ድግሪ እና ከዚያ በላይ	
6	የመኖሪያ ቦታ	1. ከተማ 2. ገጠር	
7	ስራ	1. የመንግስት ስራተኛ 2. ነጋዴ 2. ገበሬ 4. የቤት አመቤት 5. የግል ስራ	

		6. የ ጉልበት ስራተኛ 7. ተማሪ 8. ሌላ	
8	የ ወር ገቢብር	

ክፍል 2 በሚቸጋን ዩኒቨርሲቲ የተዘጋጀ ከስኳር በስታጋር ተያይዞ የሚመታን የነርቭ ግርመላ ያቃለ መተይክ

ሀ. መጠየቅ የሚሞላ ወብስኳር ታማሚብቻነት ውላ ሚጠይቁት ጥያቄ እግርዎትላይ ስሜ

ቱ ካለ አዎ ከሌለ የለም ማለት ይመልሱ 1 አዎ 2 የለም

ቁጥር	ጥያቄ	1 አዎ	2 የለም
1	የእግር ወይም የጭማየ መደን ዘዝ ስሜት አለዎት		
2	ማንኛውም እግር ወትን የማቃጠል ህመምተሰምትዎት ያቃል		
3	እግርዎትን ማንኛውም ገርሲ ካወትየተለየ የህመም ስሜት ይሰመድታል		
4	እግር ወት ወይም ጭማየ አካባቢ ጠንቻ መቆረጥ ጠቃሚ አለዎት		
5	እግር ወት ወይም ጭማየ አካባቢ መውጋት ህመም አጋጥመዎት ወቃል		
6	ቆዳዎትን የአልጋልብስ /ብርድልብስ በሚነካ ወት ሳትህመም ይሰማል		
7	ሻወር በሚወስዱበት ሰዓት ቀዝቃዛ ውን ከሞቀ ውውሃ መለየት ይችላሉ		
8	እግርዎት ቆስሎ ወቃል		
9	በህኪም ከስኳር ጋር የተያያዘ የነርቭ ግርመላ አለተብለው ያውቃሉ		

10	አብዛኛውን ዜጎች የመድከም ስሜት ይሰመወታል		
11	የመድከም ስሜት ማታይ ብስቦ ወታል		
12	በሚራመዱ ጊዜ እግር ወትን ያምወታል		
13	በሚራመዱ ጊዜ እግር ወት ይታዘዝ ወታል		
14	የእግር ወት ቆይታ የመድረቅ እና መስከሬን ጣጠቅ አለ ወት		
15	እግር ወት ተቆርጦ ያወቃል		
	አጠቃላይ ድምር		

ክፍል 3: የታማሚነት ስርዓት / ስርዓት ማጠየቅ ቁጥጥር

በጣም አልስማም፣ አልስማም፣ ነፃነት፣ እስማማለሁ፣ በጣም እስማማለሁ፣ በጣም እስማማለሁ

ተ.ቁ	ጥያቄ	በጣም አልስማም	አልስማምም	ነፃነት	እስማማለሁ	በጣም እስማማለሁ
1	ከስኳር በሽታ ጋር የተያያዘ ሽግግር የሚገኝ ጥመኝ መፍትሄ መስጠት ይከብደኛል	1	2	3	4	5
2	ስኳር በአግባቡ ካልተስተካከለ ማስተካከል ይገባል	1	2	3	4	5
3	ለስኳር ወበጣም ጥንቃቄ ያደርጋሉ	1	2	3	4	5
4	ከስኳር ጋር የተያያዙ ሌሎችን ምቹ ግር እፈታለሁ ብለው ወያምናሉ	1	2	3	4	5
5	የስኳር በሽታን ለመቆጣጠር የወሰድኳቸውን	1	2	3	4	5

		ሐ. በቆሎ መ. ማር
4	በደምወሰን ጥለ ብዙ ጊዜ የተለያዩ ዞን የሰ ካር መጠን የሚሰካ ወመቼ መቼ ነው	ሀ .በ የ ቀኑ ለ .በ የ ሳ ምን ቱ ሐ.በ የ 6-12 ሳ ምን ት መ.በ የ 6 ወሩ
5	ከ ማከተሉት ወሰን ጥበ ጣምጥሩ የ ቤት ወሰን ጥ የ ስ ኳር መጠን መለ ኪያ የ ቱ ነ ው	ሀ .የ ሸ ን ት ለ .የ ደ ም ሐ.ሁሉም እ ኩል ነ ቸ ው
6	ጣፋጭ ታቸ ወደ ግ ሞያ ሉ የ ፍ ራ ፍ ሬ ጭማቂ በደምወሰን ጥያ ለ ወውጤት የ ቱ ነ ው	ሀ .የ ስ ኳር ን መጠን ይቀን ሳ ል ለ .የ ስ ኳር ን መጠን ይጨምራል ሐ.ምን ምእ ይ ነ ት ወውጤት የ ለ ወም
7	.ከ ማከተሉት ወሰን ጥዝቅ ተኛ የ ደምስ ኳር ን ለ ማከ ምየ ሚያ ገ ለ ግ ል የ ቱ ነ ው	ሀ .3 ከ ረ ሚላ ለ .ግ ማሽ ስ ኒ የ ብር ቱ ካ ን ጭማቂ ሐ.አ ን ድሲኒ ለ ስ ሳ ሳ መጠጥ መ.አ ን ድሲኒ ወተት
8	የ ስ ፖር ት ል ምምድ መስ ራ ት የ ደምስ ኳር ን ምን ያ ደር ገ ዋ ል	ሀ . ይ ቀ ን ስ ዋ ል ለ .ይ ጨምረ ዋ ል ሐ.ምን ምእ ይ ነ ት ወውጤት የ ለ ወም
9	የ ወሰን ጥሰ ወሳ ት መቆ ጣት የ ደምስ ኳር ን ምን ያ ደር ገ ዋ ል	ሀ .ይ ቀ ን ሳ ል ለ .ይ ጨምረ ዋ ል ሐ.ምን ምል ዩ ነ ት የ ለ ወም

10	የተሸለፍኛ አግር እንክብካቤ ማባለ ወይ ቱነው	ሀ.በ የቀኑ ማየትና መታጠብ ለ.በ አልኮል መታሸት ሐ.በ አንድሳ አትመዘፍዘፍ መ.ከ ፍያ ለ ጫማማድረግ
11	ዝቅተኛ የቅባት ምግብ ችለ ምን የመጋለጥ አቅምን ይቀንሳሉ	ሀ.የ ነርቭ ለ.የ ኩላሊት ሐ.የ ልብ መ.የ አይን
12	የመደንዘዝ ዝና የመጠዘጠዝ መምን ምልክትነው	.ሀ.የ ኩላሊት ለ.የ ነርቭ ሐ.የ አይን መ.የ ጉበት
13	ከ ማከተሉት ወስን ጥክስ ኳር በሽታጋር የሚያያዝ የቱነው	ሀ.የ እይታ ችግር ለ.የ ኩላሊት ሐ.የ ነረቭ መ.የ ሳንባ ችግር
	አጠቃላይ ድምር	

ክፍል 5: የ ማህበራዊድጋፍ ጥያቄዎች

ለ ማከተሉት ጥያቄዎች ክፍለ ኛዎን መልስ ይስጡ

ምን ምን ዜያ ትንሽ ጊዜያ ተወስነ ጊዜ አብዛኛውን ጊዜ ሁሉን ምን ዜያ

1 2 3 4 5

ተ.	ጥያቄ	ምን ምን ዜያ 1	የ ትንሽ ጊዜ 2	የ ተወስነ ጊዜ 3	አብዛኛውን ጊዜ 4	ሁሉን ምን ዜያ 5
1	ማውራት ስትፈልግ አብሮ የሚሰማህ አለ					
2	በችግር ጊዜያ ማክርህ ሰው አለ					
3	ጥሩ የመወዳደር የፍቅር ወባህሪ የሚያሳይ ጊዜ					
4	አንተን በአስልቻ ጊዜያ ማረዳ					
5	የሰነል ስርዓት ዳታ የሚሰጠህ ጊዜ አብዛኛ					
6	የምታምነውን የምትወደውን ሰው የምታገኝበት ጊዜ አብዛኛ					
	7. በአሁኑ ሰዓት አግብተህ ወይስ ከቤተሰብ ጋር ነው የምትኖረው	1 አወ	2 የለም			

ክፍል 6: የጤና እና አገልግሎት ጥያቄዎች

ተ.ቁ	ጥያቄ	
1	ምግብ ሳይበሉ ያለውን ስኳር መጠን	

2	ላለፉት ሶስት ወር በደምወደሰ ጥያላ ወደ ስኳር መጠን	
3	ስኳር እንዳለብዎትካ ወቁስን ትጊዜህን ወት	
4	በቤተሰብዎ ስኳር ታማማኝ አለ	1. አዎ 2. የለም
5	የስኳር መለኪያ ማሸን አለዎት	1. አዎ 2. የለም

ክፍል 7: የስኳር በሽታን በራስዎ መንከባከብብቃት

የአመጋገብ ስነ-ምግባር የቀንብዛት በሳምንት ውስጥ መልስ

ተ.ቁ	ጥያቄ	0	1	2	3	4	5	6	7
1	በሳምንት ምን ያህል ቀን ትክክለኛ የአመጋገብ ብዕ ቅድካሜ አለህ	0	1	2	3	4	5	6	7
2	በአማካኝ ሳለፈው አንድ ወር ውስጥ ምን ያህል የቀኖችን የአመጋገብ ብዕ ቅድተክትለዋል	0	1	2	3	4	5	6	7
3	ከባለፉት ቀናት ውስጥ ምን ያህል ቀኖችን አትክልትና ፍራፍሬ ተጠቅመዋል	0	1	2	3	4	5	6	7
4	ከባለፉት ቀናት ውስጥ ምን ያህል ቀኖችን ከፍተኛ የቅባት ምግብ ተጠቅመዋል	0	1	2	3	4	5	6	7

የአካል ብቃት እንቅስቃሴን በተመለከተ

ተ.ቁ	ጥያቄ	0	1	2	3	4	5	6	7
1	ከባለፉት ቀናት ውስጥ ምን ያህል ቀን ቢያንስ ለ 30 ደቂቃ ስፖርት ትይዩሱሉ	0	1	2	3	4	5	6	7
2	ከባለፉት ቀናት ውስጥ ጥለዎት ያለ የአካል ብቃት እንቅስቃሴ ምን ያህል አደረጉ (0	1	2	3	4	5	6	7

	እንደዋና ሳይክል መጋለብና የእርጉዝ)								
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የስኳርን መጠን ከመቆጣጠር ከመቆጣጠር ጋር የተያያዘ

ተ.ቁ	ጥያቄ								
1	ከባለፉት 7 ቀናት ውስጥ ጥምን ያህል ቀናት የስኳር መጠን ህንጻ ለከተዋ	0	1	2	3	4	5	6	7
2	ከባለፉት 7 ቀናት ውስጥ ጥምን ያህል ቀናት የስኳር በባለመያየታዘዘ ዎለትን ለከተዋል	0	1	2	3	4	5	6	7

ከእግር እንክብካቤ ጋር የተያያዘ

ተ.ቁ	ጥያቄ								
1	ከባለፉት 7 ቀናት ውስጥ ጥምን ያህሉን ቀን የእግር ለምለምን የመለከታሉ	0	1	2	3	4	5	6	7
2	ከባለፉት 7 ቀናት ውስጥ ጥምን ያህል ቀናት እግርዎችን ይከታተላሉ	0	1	2	3	4	5	6	

የስኳር መድሃኒቶችን ጋር የተያያዘ

ተ.ቁ	ጥያቄ								
4	ከባለፉት 7 ቀናት ውስጥ ጥምን ያህል ቀናትን በሃኪም የታዘዘ ዎለትን መድሃኒት ወስደዋል	0	1	2	3	4	5	6	7

ከሲጋራ ማጨስ ጋር የተያያዘ

ተ.ቁ	ጥያቄ								
1	ባለፉት 7 ቀናት ውስጥ 1 ፓፍምቢሆን አጭሰዋል 1. አለ 2. የለም	0	1	2	3	4	5	6	7