ADDIS ABABA UNIVERSITY COLLEG OF HEALTH SCINCE
SCHOOL OF PUBLIC HEALTH

DEPATMENT OF HEALTH EDUCATION AND PROMOTION

PREDICTING INTENTION TOWARDS HEALTHY DIETADHERENCE AMONG TYPE TWO DIABETIC PATIENTSUSING THEORY OF PLANNED BEHAVIORIN TIKUR ANBESA HOSPITAL ADDIS ABABA, ETHIOPIA

BY: AYUB AMAN (BSC)

A THESIS REPORT SUBMITTED TO ADDIS ABABA UNIVESITY COLLEGE OF HEALTH SCIENCE SCHOOL OF PUBLIC HEALTH IN PARTIAL FULFILMENT OF THE REQUIREMENT OF MASTER OF PUBLIC HEALTH WITH SPECIALITY IN HEALTH EDUCATION AND PROMOTION

DECEMBER 2020,

ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY COLLEG OF HEALTH SCINCE
SCHOOL OF PUBLIC HEALTH

PREDICTINGINTENTION TO HEALTHY DIETADHERENCE AMONG TYPE TWO DIABETIC PATIENTS USING THEORY OF PLANNED BEHAVIOR IN TIKUR ANBESA HOSPITAL ADDIS ABABA, ETHIOPIA

BY

AYUB AMAN (BSC)

Advisor

1. Dr .Mitike Molla (MPH, Ph.D.(associate professor))
2. Mr. Muligeta Tamre (MPH, Ph.D. candidate)

A THESIS REPORT SUBMITTED TO ADDIS ABABA UNIVESITY COLLEGE OF HEALTH SCIENCE SCHOOL OF PUBLIC HEALTH IN PARTIAL FULFILMENT OF THE REQUIREMENT OF MASTER OF PUBLIC HEALTH WITH SPECIALITY IN HEALTH EDUCATION AND PROMOTION

ADDIS ABABA UNIVERSITY COLLEG OF HEALTH SCINCE
SCHOOL OF PUBLIC HEALTH

PREDICTING INTENTION TOWARDS HEALTHY DIETADHERENCE AMONG TYPE TWO DIABETIC PATIENT IN TIKUR ANBESA HOSPITAL ADDIS ABABA, ETHIOPIA USING THEORY OF PLANNED BEHAVIOR

BY

AYUB AMAN (BSC)

Approved by:

Primary adviser Dr .Mitike Molla (MPH, Ph.D.(associate professor))

Date January 2021 signature: _____.

External examiner: Dr. Yitbarek Kidane (MPH, Ph.D) signature: _____.

Internal examiner: Mrs yordanos Tadesse (MPH) signature:_____.

ACKNOWLEDGMENT

Throughout the writing of this thesis I have received a great deal of support and assistance.I would like to express my special thanks of gratitude to my advisors Dr .Mitike Molla and Mr. Mulugeta Tamre for their consecutive and constructive comments for the fulfillment of this thesis report. I would like to thank Addis Ababa University, School of Public Healthfor support provided in throughout the thesis work.

I would also like to thank Dr. Eshetu Girma for his insightful advice and support, Police University College for giving me the chance to join AAU,SPH, Mr. Abadi Hile, my colleague and friends for their academic and moral support.

My heartfelt gratitude also goes to my dearest mother Atikilit lakew (etiye) and to all my brothers and sister for binge there supportive through my work. The last but not the list I would like to thank supervisor, data collector and finally Tikur Anbesa specialized hospital. The last but not the list I would like to express my deepest gratitude to all participants of this study.

Table of Contents

atklet@gmail.com

List of tables

List of figures

Abstract

Background: Diabetes mellitus is one of the rapidly increasing non communicable diseases and an important public health problem all over the world. Ethiopia is among the top four countries with the highest adult diabetic populations in sub-Saharan Africa. Healthy eating practice is poor among Ethiopian diabetes patients which affecting patients progress in controlling complications.Theory of planned behavior is one of most popular theories used in health education and promotion. TPB effectively predict and explain intention towards healthy diet among diabetic and non- diabetics.

Objective: To predict Intention towards healthy diet adherence among type 2 diabetes patients in Tikur Anbesa Hospital diabetic clinic using theory of planned behavior, 2019.

Methods: Institution based cross sectional study was conducted among diabetic patient from follow up clinic in Tikur Anbesa Specialize Hospital. Study participant was selected using systematic random sampling technique. Data were collected using standard TPB questioner after elicitation study conducted to explore beliefs associated with healthy eating. Multiple linear regressions and correlation analysis were done between TPB constructs.

Result: The total study participants were 385(91%). Median age of the respondent was 55 with (± 10.6 SD). Among The study participant 223 (58%) were female, 150(39%)were employed, 270 (70%) lived in Addis Ababa. The constructs of TPB explain 38.7% variance in intention for dietary adherence. The strongest predictor of intention towards dietary adherence were Attitude (β = 0.289, P <0.001, CI=0.190, 0.360), perceived behavioral control (β= 0.285, P < 0.001,CI=0.110,0.222) and subjective norm (β= 0.172, P<0.001, CI=0.078,0.230).

Conclusion: This study revealed that theory of planned behavior is useful to explain and predict intention towards dietary adherence among diabetic patients. Attitude and perceived behavioral control towards healthy diet was strongest predictor of intention for dietary adherence. Hence

health education and promotion program should focus on bringing a positive attitude and increase self-efficacy toward healthy eating among diabetes patients.

List of acronyms

DM diabetes mellitus
HBM health belief model
IDF international diabetes federation
NCD non communicable disease
PBC perceived behavioral control
SN subjective norm
TASH Tikur anbesa specialized hospital
TPB theory of planed behavior
TRA theory of reasoned action

1.Background

Diabetes mellitus is a chronic disease significantly affecting the quality of life affected populations and can lead to poor health outcomes of individuals, families and communities. Its impact affects social and economic outcomes including costing millions of health care budgets of nations across the world. The risk factors for DM include raised blood pressure, tobacco use, alcohol consumption, physical inactivity, poor dietary patterns and overweight(1).

Diabetes occurs when the pancreas is no longer able to make insulin or when the body cannot make a good use of the insulin it produces. There are three main types of diabetes, type 1 is caused by an autoimmune reaction in the body's immune system attack the insulin producing beta cell of the pancreas, and as a result thebody produces little or no insulin. The second is type 2; it is the most common type of diabetes. High blood glucose level is the result of inability of body cells to respond fully to insulin. The third type is gestational DM it is characterized by high blood glucose level during pregnancy(2).

According to international diabetes federation (IDF), the global prevalence of diabetes among adults has been increasing over recent decades, in adults age 20-79 years was estimated to be 8.8% in 2015 and predicted to increase to 10.4% in 2040. It was estimated that 415 million people lives with diabetes age 20-79 years. 5 million deaths attributable to diabetes and the total global health expenditure due to diabetes was estimated 673 billion USD(3, 4).

Studies shows that diabetes mellitus is increasing in Africa according to international diabetes federation (IDF) estimated in a year 2019, 19 million adults were living with diabetes and 60 % of adults currently living with diabetes are unaware of their condition. The causes are rural to urban migration and urbanization is the main reason for increasing prevalence of diabetes in Africa and its associated with a shift in life style from healthy traditional pattern to the urban scenarios of increased food quantity and reduced quality, low levels of exercise, smoking and

increased alcohol availability and it is associated with high complication burden in the continent(2, 4).

Diabetes is complex chronic illness that requires continuous medical care with numerous risk reduction strategies; this diabetic self-care includes healthy diet, physical activity, foot care and self-monitoring of blood glucose. Dietary and other self-care management involves patients, families and health care providers.(5).Good diabetic management is a balance between medication, diet and physical activity. Dietary management is consider to be corner stone of diabetic care it based on principle of healthy eating in context of social, cultural, psychological influence on food choice(6).

Theory of planned behavior is one of most popular theories used in health education and promotion. TPBeffectively predict and explain intention towards healthy diet among diabetic and non- diabetics. Intention influenced by three constructs of TPB attitude, subjective norm and perceived behavioral control. Attitude is the overall positive or negative evaluation of the behavior, subjective norm is the belief that influential peoples approves or disproves of engaging in a behavior and perceived behavioral control is the individual perception on the behavior is with is their own control and they feel confident they can act on their own behalf(7-9)

1.1. Statement of the problem

Diabetes mellitus associated clinical complications are the most important cause of morbidity and mortality and have considerable effect on patient's quality of life and productivity . Sub-Saharan Africa like the rest of the world is experiencing an increasing prevalence of diabetes together with other non-communicable diseases (6). The burden of diabetes and diabetic related mortality and disability isrising inAfrica and the causes are increasing sedentary lifestyles coupled with rapidly growing urban cultures and modified diets. diabetes predicted to triple the prevalence of diabetes mellitus in the next 25 years worldwide (10).

Ethiopia is in the fourth position among top sub-Saharan African countries with largest number of people living with diabetes.According to international diabetic federation (IDF) prevalence of diabetic in Ethiopia among adults is 5.1% and total cases of diabetes in adults wear 2,567,000 in a year 2015.The total number of death also 34,262 in IDF 2014 report. The prevalence may increase from estimated number, a study from east Gojam in Ethiopia indicated that the magnitude of undiagnosed DM was 11.5%(3, 11).

Studies in Addis Ababa shows DM especially type 2 DM is an important cause of admission to Ethiopia's largest referral hospitals. A report from TASH indicated that between 2010-2013, 6.5% patients from total admission were diabetes cases and many of the patients had already developed complications at admission. one third of the patients were admitted with diabetic foot ulcer/gangrene, about 20% with diabetic ketoacidosis or cardiovascular disease/stroke and 10% with renal failure (12).

Study from jimma hospital 30 % diabetes patient developed acute complications mainly diabetes ketoacidosis and 52% had one or more chronic complications neuropathy 29%, nephropathy 15% and visual disturbance was 33%(13).Systematic review on Self-care practice among Ethiopian diabetes patients indicated 49% practice the recommended level of diabetic self-care, 50% of them practice recommended diet for diabetes (5).

Studies from Ethiopia TASH and Bahir Dar Felege Hiwot Hospital showed that adherence to diet control was only 23% and 35% respectively. study from Yekatit 12 hospital indicated that 51%, Study from Dire Dawa Dilchora Hospital 63% of diabetes patient had poor dietary practice. Educational status, nutrition education, age, family support were found to be associated factors(6, 14-16).

To prevent serious morbidity and mortality diabetes treatment requires dedication to demanding self-care behaviors in multiple domains including food choices, physical activity, proper medications intake and blood glucose monitoring. (10, 17).

1.2. Significance of the study

Diabetes mellitus is disease that can be controlled from causing permanent health problem with proper medication adherence, physical exercise and diet control. Many studies showed that diet control and adherence for healthy diet is low when comparing to medication adherence. Various studies were done in Ethiopia on diabetic patient dietary adherence and practices suggested there need to be a work on increasing health educations.

Patient with diabetes need to choose a suitable diet that recommended to them by health professionals and that needs permanently change on their belief, dietary habit and pattern but this patient rarely comply with suitable diet as habitual behavior(1, 17-19).

Theory of planned behavior has proved in predicting future behavior in various health related behavior including diet, physical exercise, among diabetic patient and it was successfully predicted intention and behavior howeverintention for dietary adherence was not assessed in Ethiopia and this study will help to predict patients intention for dietary adherence behavior using theory of planned behavior constructs attitude, subjective norm and behavioral control and it will explore which theory of planned behavior construct explain intention.

Understanding diabetespatient's intention for healthy diet adherence will help to provide proper health education intervention programfor effectiveness of controlling diabetes and by that decrease complications and mortality.

1. Literature review

2.1. Introduction to diabetes

Diabetes mellitus is a chronic disease significantly affects the quality of lifeand can lead to poor health outcomes of individuals, families and communities. Its influence affects social and economic outcomes including costing millions of health care budgets of nations across the world. The risk factors for DM include raised blood pressure, tobacco use, alcohol consumption, physical inactivity, poor dietary patterns and overweight(1).

According to international diabetes federation estimate currently 463 million people are living with diabetes and there will be 578 million adults with diabetes by 2030 and 700 million by 2045.In Africa an estimated 19 million adults age 20 – 97 lived with DM. regional prevalence of 3.9%, and 60% of adult are unaware that they have the condition.The incising prevalence of diabetes worldwide is determined by complex factors of socioeconomic, demographic, environmental and genetic factor. The continued rising is mainlydue to the increase in type 2 diabetes and related risk factors which include rising levels of obesity, unhealthy diet and physical inactivity.Increasing urbanization and change of lifestyle habit are the contributory factors for the increasing prevalence of type 2 DM at societal level. The global prevalence of DM in urban area is 10.8%, in rural aria is lower at 7.2%. uncontrolled diabetes can cause both acute and chronic complications such as diabetes eye, oral, cardiovascular, kidney and foot ulcer are among the most common chronic complications (2).

Prevalence of diabetic in Ethiopia among adults is 5.1% and total cases of diabetes in adults wear 2,567,000 in a year 2015.The total number of death also 34,262 in IDF 2014 report. The prevalence may increase from estimated number, a community based study from east Gojam in Ethiopia indicated that the magnitude of undiagnosed DM was 11.5%(3, 11). Diabetes mellitus is accounted for more than 5% of medical admission to the largest referral hospital in Ethiopia majority had type 2 DM and among this diabetic foot ulcer and non-communicable disease constituted for hospital admission(12).

2.2. Diabetes dietary practices and adherence

For effective management and good glycemic control patients need to have adequate levels of knowledge of diabetes regarding self-care a concept that can foster adherence to medications, good dietary pattern and physical activity.Poor adherence to medications and poor self-care behaviors has also been reported to be barriers for effective management of DM. Most of the risk factors and its complications are modifiable, Self-management approaches such as self-monitoring of blood glucose, dietary restrictions, regular foot care and ophthalmic examinations have all been shown to noticeably reduce the incidence and progression of DM complications and these can be achieved by patients themselves via effective education and enhanced knowledge(1).

Dietary management is considered to be one of the foundations of diabetes care. Dietary practice refers to patients choices in food consumption based on diabetes nutrition education that gives emphasis to intake of food with lower fat, higher fiber and lower sodium(6, 17).

Good diabetes management is a balance between healthy diet, exercise and medication. The problem however is that most diabetic patients have difficulty of identifying the recommended quality and quantity of food that they have to eat in order to control their blood glucose level. Dietary practice refers to patients choices in food consumption based on diabetes nutrition education that lives emphasis to intake of food with lower fat, higher fiber, and lower sodium (6).

Patients with DM should choose appropriate diet, that permanently changes their beliefs, and Dietary habits and patterns but these patients rarely comply with a suitable diet as a habitualbehavior(19).Performing self-care behaviors is affected by factors such as habit, routine, and lifestyle. These factors may require day-to-day decisions to perform and maintain people beliefs and attitude (20).

Study from TASH showed thatnon-adherence todiet was 75% and generally adherence to recommended management for diabetes was considerably low. Improving awareness of patients and the community at large is essential especially on medication adherence, glycemic controland diet management. Age, level of education, and occupational status were found to have impact on adherence to self-care practice(14). On other hospital based Study from Bahir Dar on the dietary practice of type 2 diabetes patients was only 35 %. Factors associated with good dietary practice

were getting nutrition education on diabetes diet management, attending secondary school and above, and having awareness of diabetes diet and family support(15).

2.3. Reasons for poor dietary adherence

It is known that for a patient to improve quality of life and to prevent diabetes associated complications knowledge is an essential factor for behavior change but it cannot be a sufficient condition to behavior change by its own alone. Studies in various part of Ethiopia Addis Ababa, Jimma, Felege Hiowot hospital has shown knowledge on diabetes among the patient found to be very low(1, 6, 10).despite this finding study in Harrar found high level of knowledge and recommended diet intake knowledge wear also high however majority of them did not follow the recommended self-care practicesthis finding indicated low level of education, not getting diabetic nutrition education at hospitals and low economic status are the main factors(17).

Study in Jimma showed significant number of diabetic patients had low level of knowledge, poor self-care behaviors and low level of adherence to medications. These findings suggest the need to work on integrated interventional management on diabetic knowledge, self-care behaviors and adherence to medications. Education, awareness creation and implementation of good self-care behaviors could be improved as cross cutting interventions (1).

2.4. Theory of planned behavior

Theoretically based frameworks lay the foundation upon which important factors affecting eating and physical activity behaviors can be drawn, tested and applied in patients' education. The Theory of Planned Behavior (TPB) has proved to be an effective framework within which patients' perceptions and beliefs about dietary and physical activity behaviors could be measured and empirically tested(21).

The theory of planned behavior is frequently used to study health related decision making behavior. The TPB is an extension of the Theory of Reasoned Action (TRA) but includes a third construct known as perceived behavioral control (PBC). According to this theory health related behavior can be predicted by the intention construct The TPB model suggests that intention is directly driven by three major constructs attitude, subjective norm, and PBC(22).

Intention: - refers to readiness to perform a given behavior. As general rule, the stronger the intention to perform a behavior the more likely the behavior will be performed.it is assumed to be an immediate antecedent of behavior(22).

Attitude: -is the degree, to which an individual has a favorable or unfavorable evaluation of the behavior, it assumes to have two components which works together; belief about consequence of the behavior *behavioral belief* and the corresponding positive or negative judgments about each these features of the behavior outcome evaluation. (23)

Subjective norm: - measures the importance others hold about performing or not performing a behavior and one's willingness to comply to those referents.it assumed to have two components which works in interaction; the belief about how other people who are important to them, would like them to behave *normative belief* and willingness to accomplish behavior by referent's interest or pressure(22, 23)

PBC describes the perceived ease or difficulty an individual has for performing a behavior. In addition PBC is thought to directly affect behavior by accounting for factors outside an individual's control and especially for behaviors not under volitional control.PBC describes the perceived ease or difficulty an individual has for performing a behavior. In addition PBC is thought to directly affect behavior by accounting for factors outside an individual's control and especially for behaviors not under volitional control. PBC is a combination of two measurements; self-efficacy and controllability.Self-efficacy is the level of difficulty that is needs to perform a behavioror one's belief in his/her own ability. Controllability refers the belief that one's behavior is volitional(22, 23).

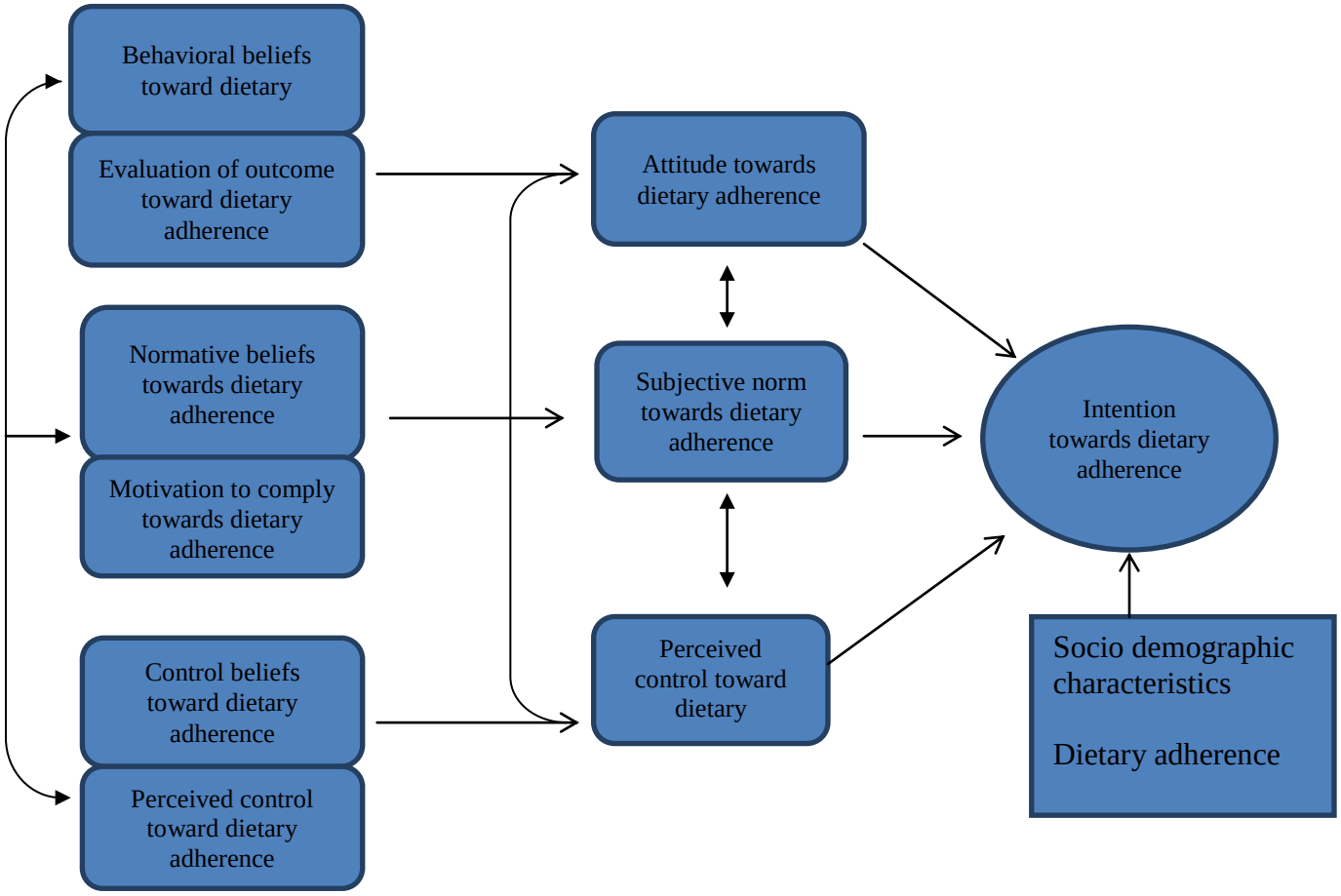
2.5. Theory of planned behavior on application of dietary behavior

TPB provides an improvement on the health belief model, social cognitive theory and protection motivation theory and TPB to be the superior predictor of intentions and behavior. Psychosocial attributes particularly the intention constructs may have a substantial contribution towards decision making process among Type 2 diabetes patients within physical activity and dietary practice domains. The decision making process rely on the intention construct from a social cognitive perspective. Intention construct is explained by a number of social cognitive theories as a key factor in predicting behavior (21, 24).

The TPB variance including attitude, subjective norms, perceived behavioral control, and intention can successfully predict the behavior of Physical activity's (25), and healthy dietary choice or dietary assessment(19, 26). Various studies showed that TPB used in DM patients to study and to change in physical activity and diet behavior, Behavioral interventions from UK using TPB has showed Physical Activities /exercise clinically significant improvements in long-term glucose control(27). Study in Iran among pre diabetes indicated that TPB was used as a predictive model and monitoring tool to implement life style modification among pre diabetes patients to prevent or slow down the development of type 2 diabetes. On other experimental study in Iran on type2 diabetes after TPB based intervention the mean score of awareness of the participants in the experimental group increased significantly the effect of subjective norm improve the awareness of the participant(20, 28).Despite this TPB ability's to predict future dieting or physical activity is limited and studies indicated the need to incorporate constructs such as planning and anticipated regret. "Anticipated regret" refers to beliefs about whether or not feelings of regret or upset will follow action (25, 29).TPB is useful tool in helping behavior changing programs by help us determine where the gaps are. The finding from America suggest that interventions aimed at individuals with type 2 diabetesshould ensure that people have the necessary resources to overcome potential obstacles to Behavioral performance and attitude towards healthy eating and a focus on perceived behavioral control and social influence are important to promote physical activity and healthy eating in persons at risk for diabetes. This study suggests that the TPB is a useful framework for understanding important beliefs related to physical activity and healthy eating intentions of persons at risk for diabetes(9, 30).

Theory of planned behavior was used in various health related studies and it found to be a good predictor of dietary behavior, meta-analysis study on prediction of health related behavior indicated In relation to predictions of intention attitude, SN and PBC together accounted for 44.3% of the variance Attitude was the strongest predictor ($\beta = 0.35$), followed by PBC ($\beta= 0.34$) and SN ($\beta=0.15$) and physical activity (23.9%) and dietary (21.2%) behaviorwere generally better explained with intentions being the key predictor of subsequent engagement in behavior. In contrast safer sex, detection, risk and abstinence behavior were relatively poorly predicted by the model with on average (8%) less variance explained(23).

Figure 3: conceptual framework of intention for dietary adherence using theory of planned behavior among diabetes patient in Tikur Anbesa hospital, Addis Ababa, Ethiopia 2020



3.Objectives

3.1. General Objectives

To predict Intention towards healthy diet adherence among type 2 diabetes patients in Tikur Anbesa Hospital diabetic clinic using theory of planned behavior, 2019.

3.2. Specific objective

- To measure attitude toward healthy dietadherence among type 2 DM patients in Tikur Anbesa Hospital.
- To identifyperception of importance others beliefstowards healthy diet adherence among DM patients in Tikur Anbesa Hospital
- To identifyperceived difficultytowards healthy dietadherence among type 2 DM patients in Tikur Anbesa Hospital
- To assess magnitude of adherence towards health diet among type 2 DM patients in Tikur Anbesa Hospital.

4. Methods

4.1. Study design

Quantitative method Institutional based cross sectional study was conducted using a formative qualitative study to guide development of quantitative tool among diabetic patients in Tikur Anbesa specialized hospital.

4.2.Study area and period

Tikur Anbesa specialize hospital was established in 1964 it is the largest referral hospital in the country with 700 beds. It is the first and the largest medical University teaching hospital.The hospital also has 950 permanent and contract administrative staff to support the hospital activities. Tikur Anbesa Specialized Hospital is now the main teaching hospital for both clinical and preclinical training of most disciplines. It is also an institution where specialized clinical services that are not available in other public or private institutions are rendered to the whole nation.

The TASH has 200 physicians, 379 nurses and 115 other health professionals are working to providing health care services. Various departments, faculties and residents under School of Medicine provide patient care in the hospital.

The hospital endocrinology unit under the school provides specialized service for patient with different endocrinology problems, resent data's from the hospital indicated there were around 12000 patients visited the diabetic clinic in a year and 3000 patients had regular follow-up. This study was conducted in June 2019.

4.3. Study population

4.3.1. Source population

Study population was all type II diabetic patients attending endocrinology unit of Tikur Anbesa Specialized Hospital.

4.3.2. Study subject

Study subjects were diabetes patient attending diabetic clinic in TASH during data collection period.

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion criteria

- Patient who were diagnosedwith type 2 diabetes and have follow-up in the endocrinology unit at the time of data collection period.
- Willing to participate in the study

4.4.2. Exclusion criteria

- Patient who are severely sick at the time of the study.

4.5. Sample size

4.5.1. Sample size determination

For main objective sample size was calculated using single proportion formula. There was no similar study found on intention for dietary adherence in Ethiopia. To get the maximum sample size we assume 50% of patients follow the recommended behavior. By assuming 95% CI the calculated sample size will be **384.**

For 5th objective by taking 25 % (14) adherence to dietary adherence in TASH By assuming 95% CI the calculated sample size will be**288** for this study highest sample were taken**384.**

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

Where;

n= the desirable sample size

z(α/2) = the critical value at 95 % level of significance (1.96)

p = proportion of patient who follow recommended behavior 0.5

d = precision of measurement (acceptable marginal error) 0.05

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

After adding 10% non-responding rate the final sample size were**422**

4.5.2. Sampling procedures

For qualitative study 20 participants were recruited from Zwditu memorial hospital diabetic clinic in Addis Ababa by purposive sampling technique. In-depth interviews was conducted. The results from the qualitative study were used to develop a tool for the indirect measurements of the constructs of TPB (indirect measurement of attitude, subjective norm and PBC) for final quantitative study.

For quantitative study sampling frame was obtained from registration book of TASH diabetes clinic.During the study period there were about 3000 diabetic patients who were registered and had regular follow up at diabetic follow up clinic most of the patients were given follow-up appointment for three month. Around 800 patients were attending there follow-up within one month. The clinic provides service for three days per week Mondays and Wednesdays and Friday.

Participants who were attending the clinic at the time of data collection were randomly selected using Systematic random sampling technique. All the Type 2 diabetes patients who were attending the clinic during one month duration every two patient's interval were selected.

4.6. Variables

Dependent variable:

- intention for dietary adherence of type 2 DM patients

Independent variables:

- Attitude, subjective norm, and perceived behavioral control of dietary adherence type 2 diabetes patients. Adherence to healthy diet among diabetic patient, Socio demographic variables age, sex, educational status, income, and family history, and duration of diagnosis are independent variables.

4.7. Data collection procedures

4.7.1. Data collection instrument for elicitation study

For elicitation study qualitative data were collected using semi-structured in-depth interview guide. The interview guide was prepared based on the predictive construct of TPB model attitude, subjective norm, and PBC. Study participant were selected by purposive non-probability sampling. In-depth interview was done in zewditu memorial hospital diabetic follow up clinic in Addis Ababa this hospital is located in 2km distance from original study area. Data collection tool was designed by reviewing TPB guidelines. The interview was in Amharic language.

4.7.2 Data collection instrument for quantitative study

Direct items of question of intention, attitude, subjective norm and perceived behavioral control were developed according to TPB manuals and literatures. Each direct item constructs contain three to four items.Indirect items of questionnaire was developed based on elicitation study conducted by one to one interview among 20 participant to identifybeliefs on recommended dietary adherence using open ended questions. The participant were required to answer the advantage and disadvantage of following recommended diet for diabetes, peoples who would approve or disprove of following recommended diet and factors that would facilitate or hinders for following recommended diet for diabetes. Findings of elicitation study responses were set in to themes in order and the most frequent beliefs were used for the development of indirect items. Indirect items consist of four constructs of behavioral belief with its corresponding outcome evaluation, normative belief with its corresponding motivation to comply, control belief with its corresponding perceived power influence each consists four items. The questionnaire was prepared in English and it was translated to Amharic language for appropriateness and easiness. The Amharic version was again back translatedto English to check for consistency of meaning. Based on literature dietary adherence was assessed using the modified form of the ten-item Morisky Medication Adherence Scale (MMAS-8) (6).Ten socio demographic question were included. A structured and self-administered questionnaire with closed-ended questions was used to collect the quantitative data from the respondents after pretest on 5% of the sample size 2 weeks before data collection at Zewditu hospital modification were made where needed.Quantitative study Data was collected by the trained health professionals working in diabetic clinic at TASH the procedure was supervised and each data was cheeked and corrected.

Data quality assurance for elicitation study

The trustworthiness of the data of the qualitative study was assessed by the criterion of credibility, dependability, conformability, and transferability. Credibility was assured by triangulation by person (use for multiple sources for the truthfulness of the findings like a selection of participant from deferent age groups). Dependability and conformability were assured by inquiry audit, transferability by a careful sampling of the participant to assure generalizability of the finding.

Elicitation study data processing and analysis

The elicitation study was used to develop the indirect measures and the content of the response of qualitative data was transcribed and analyzed by labeling the themes. Listing in order of frequency for each of the predictor of TPB model was done. This was done by using open code software.

4.7.2. Data quality assurance

The data collection questionnaire first prepared in English and then translated into Amharic and back to English for checking language consistency by a different person with an excellent Amharic and English speaking skill. Training on the objective of the study, and method of data collection, interview technique &content of questionnaire was given to supervisors and the data collectors.

For establishing the reliability of the direct measurement of the TPB constructs index of internal consistency were tested after recoding negatively worded items to determine whether the items in the scale are measuring the same constructs and for indirect measures of TPB constructs the test re-test reliability test were done among ten participant and the second questioner was administered in the same participant who were filling the same questioner before 15 days. The final questionnaire was pre-tested and commented by DM patients from Tikur Anbesa hospitalfor ambiguity, difficulty, repetitiveness, annoying features of wording and formatting and for cultural appropriateness.

Measurement for TPB items

Behavioral intention to adherence to healthy diet: This referred to DM patients plan to follow the recommended diet in the near future. Measured using three items with 5 point scale with bipolar ends "strongly agree-strongly disagree" response format. The mean of three item will be calculated the higher the score in the intention will be refers the strong the intention formation.

Direct measurement of attitude: measured using three semantic differential items using five scales which are judgmental, items that are negatively worded points were recorded and summed, so that higher score reflect a positive attitude towards adherence to healthy diet.

Indirect item of attitude Four behavioral beliefitems with five point likert scale (unlikely _ likely, extremely undesirable _ extremely desirable) was multiplied with its corresponding outcome evaluation four items with five point scales with both negative and positive ends and then summed to calculate composite score of indirect attitude scale. In which higher scores indicate positive attitude towards toward adherence to healthy diet.

Direct measure Subjective norm:measured using four items with five point scale using bipolar adjectives, which are judgmental, items that are negatively worded points were recorded and summed, so that higher numbers reflects referent others was approvetowards adherence to healthy diet.

indirect measure subjective norm: normative beliefs was measured using four items with five point likert scale with negative and positive end point (agree-disagree, I should _ I should not), for motivation to comply with each referents four items with five point likert scale scored (approve – disprove, important _ not important) was used and each normative belief items were multiplied with motivation to comply to compose the indirect subjective norm scale. The higher scores indicate greater perceptions that referent other endorsetowards adherence to healthy diet.Lower score means that DM patient's experiences social pressure not totowards adhere to healthy diet.

Direct perceived behavioral control: Four items with 5 point scale were used to measure perceived behavioral control directly. A sum score was constructed by adding items higher numbers reflect greater control to adherence to healthy diet.

indirect measure of PBC:control belieffour items was measured using bipolar agree-disagree five point scales and perceived power is measured using four items with bipolar with negative and positive end point Likert scale format using the same five point scale.

4.8. Operational definitions

Attitude toward adherence to healthy diet: this meant diabetes patient favorable or unfavorable manner to eat healthy diet recommended to them.

Subjective norms: this is diabetes patient's perception that significant others, in general, think about diet that DM patient need to follow as a normative action.

Normative beliefs: perception of significant others performance about whether one should perform a behavior.

Motivation to comply: the extent to which a person feels inclined to match his or her behavior to various sources of social pressure

Perceived behavioral control towards adherence to healthy diet: this indicated DM patient's confidence about following healthy diet in the near future, if they desired to.

Control beliefs:beliefs about the likelihood that one possesses the resource and opportunities through necessary to execute the behavior.

Adherence: active voluntary and collaborative involvement of patient in mutually acceptable course of behavior to produce therapeutic result.

dietaryAdherence was measured by using ten items and the total score with zero taken as high adherence those with the score one and two was take as medium adherence those with the score three and above were taken as low adherence

Healthy diet for diabetes: is a healthy eating plan that's naturally rich in nutrient, low in fat and calories. Fruit, vegetable and grain are key part of diabetes diet plan.

4.9. Data Analysis procedures

Responses in the completed questionnaire was coded and entered in to Epi-data version 3.1 and it was exported to Statistical Packages for Social Sciences (SPSS) window 21.0 for analysis.

For the direct measures the 'recode' command was used to recode negatively worded responses. Item analysis on the items relating to the direct measures was used to establish internal consistency.For each scale Cronbanch's alpha, (α) score of ≥0.6 were taken as an acceptable measure of internal consistency of direct items using the entire sample. on the scale for indirect items test re-test reliability were tested inter class correlation coefficient $r \geq 0.7$ were taken.

Descriptive statistical measure like mean and standard deviation were done for socio-demographic, dietary adherence and direct/indirect items.one way ANOVA was calculated to identify the mean deference of the predictive variable with the outcome.

Multiple linear regressionwas done after assumptions were cheeked for modal fitness. Intention was entered as dependent and socio-demographic, dietary adherence, attitude, subjective norm and perceived behavioral control as independent. Correlations were done between direct and indirect measures of the same construct, to confirm the validity of the indirect measures. Standardized coefficients and adjusted R^2 value were used to interpret the effects and variability in the dependent variable, respectively. P-value < 0.05 was considered to indicate significant association.

4.9.1. Analyses of each constructs of TPB model

Analyses using direct measures of predictor variables

Negatively worded responses were recoded items related to direct measure analyzed to establish internal consistency. All items with internal consistency co-efficient of>0.6 are included in the composite variable. new variable was defined clearly, so that the variable labels were included in the output file.

Using multiple regression procedure intention was entered as the dependent variable and direct measure of attitude, subjective norm and perceived behavioral control as predictor variables.

Analyses using indirect measures

For indirect measures Weighted (multiply) each behavioral belief by the score for the correspondent outcome evaluation to create a new variable that represents the weighted score for each behavioral belief. Similarly, weight each normative belief by the score for motivation to comply and each control belief by the score representing the influence of the control belief.Weighted beliefs were added to create a composite score for attitude, subjective norm and perceived behavioral control. Simple bivariate correlation was calculated between direct and indirect measures of same construct to confirm the validity of indirect measure.

Attitude

Attitude toward recommended dietary adherence among DM patients is the degree to which performance of the behavior is positively or negatively valued. According to the expectancy-value model, attitude toward behavior is determined by the total set of accessible behavioral beliefs linking the behavior to various outcome and other attributes. Specifically the strength of each belief (b) was weighted by the evaluation (e) of the outcome or attribute, and products are aggregated, as shown by the following equation.

$$A \propto \sum b_i e_i$$

Subjective norm

Subjective norm is the perceived social pressure to engage or not to engage in the behavior. Taking this analogy to the expectancy-value model of attitude it was assumed that subjective norm is determined by the total set of accessible normative beliefs concerning the expectations of important referents. Specifically, the strength of each normative belief (n) is weighted by motivation to comply (m) with the referent in question, and the products are aggregated, as shown by the following equation.

$$SN \propto \sum n_i m_i$$

Perceived behavioral control

PBC refers to people's perceptions of their ability to perform a give behavior. Drawing an analogy to the expectancy-value model, it was assumed that perceived behavioral control is determined by the total set of accessible control beliefs, i.e., beliefs about the presence of factors that may facilitate or impeded performance of the behavior. Especially the strength of each

control belief (c) was weighted by the perceived power (p) of the control factor, and the products are aggregated, as shown by the following equation.

$$PBC \propto \sum c_i p_i$$

Intention

Intention is an indication of person's readiness to perform a behavior and it is considered to be the immediate antecedent of behavior. The intention based on attitude toward the behavior, subjective norm and perceived behavioral control, with each predictor weighted for its importance in relation to the behavior and population of interest.

4.10. Data quality management

Data quality was ensured, data collection was closely supervised by supervisor and principal investigator for clarity, completeness and proper procedure of data collection. After data collection thequestionnaires were entered and coded in to Epi data 4.4.2 and exported to SPSS 20 statistical software.

4.11. Ethical consideration

Participants wasinformed about the purpose of the study, participation was voluntary they were informed they can withdraw from the study at any time, and how the data will be used. Data was processed anonymously and confidentially.

4.12. Dissemination of results

The finding from this study will be presented to Tikur Anbesa Specialized Hospital department of endocrinology and Ethiopian diabetes association. We will also publish the results in peer reviewed scientific journals.

5. Result

5.1. socio-demographics

The response rate of this study was 385 (91%). The median age of the respondent was 55(± 10.6 SD). 65%(246) of the participants were age between 46 _65 years old. Among The study participant 223 (58%) were female. Considering the educational status only 26(7%) were illiterate and 146 (38%) of the respondent were attends secondary school. Most, 253 (66%) of respondent have been diagnosed for DM before five years and above (Table-1).

Table 1:Socio-demographic characteristics of DM patients in Tikure Anbesa Hospital Addis Ababa, Ethiopia 2020

variable	category	frequency	percent
Age	30_45	67	17.4%
	46_55	126	32.7%
	56_65	120	31.2%
	66_75	59	15.3%
	67_90	12	3.1%
Sex	Male	162	42.1%
	Female	223	57.9%
Religion	Orthodox	221	57.4%
	Islam	69	17.9%
	Protestant	74	19.2%
	Other	21	5.5%
Education	No formal education	26	6.8%
	Read and write	33	8.6%
	Primary school	100	26.5%
	High school	146	37.9%
	College and above	80	20.8%
Occupation	Employed	150	39%
	None employed	102	26.5%
	Retired	133	34.5%

Marital status	Never married	37	9.6%
	Married	270	70.1%
	Divorced	36	9.4%
	Widowed	42	10.9%
Monthly income	0 – 1000 birr	140	35.5%
	1001—2000 birr	85	22.1%
	2001 – 3000 birr	62	16.1%
	More than 3001 birr	101	26.2%
Residence	Addis Ababa	326	84.7%
	Around Addis Ababa	42	10.9%
	other	17	4.4%
Since first diagnosis	1-5 years	132	34.3%
	6- 10 years	126	32.7%
	More than 11years	127	33%
Family history	Yes	138	35.5%
	No	229	59.5%

5.2 Dietary adherence

About 196(50.9%) of them had poor adherence,190 (30.9%) respondent had medium level of dietary adherences and 70 (18.2%) of participant had high dietary adherence.

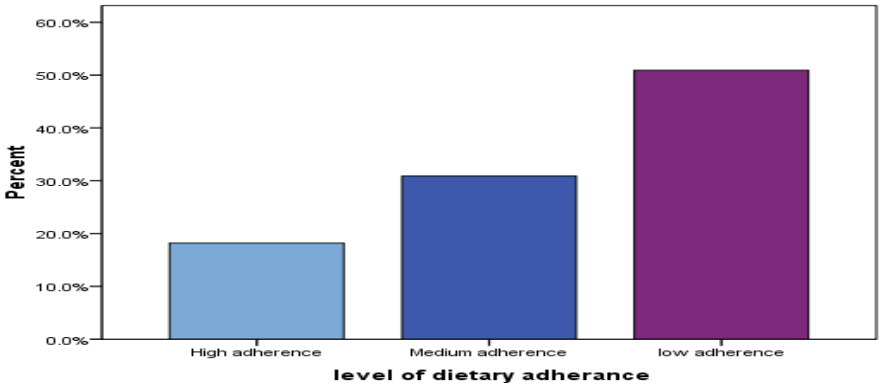


Figure 4: level of dietary adherence among DM patients in Tikur Anbesa Hospital, Addis Ababa, Ethiopia, 2020

5.3. theory of planned behavior construct variables

5.3.1. Direct items of TPB

According to the participant response towards intention for dietary adherence 235(61%) were strongly agreed that they expect to regularly follow their recommended diet to prevent complications, 229 (59.5%) respondent strongly agreed that they want to follow their diet plan and 228 (59%) strongly agreed that they intended to follow their diet plan (Table 8).

Participants response for direct item of attitude also shows that 247 (63.9%) were strongly agreed that following their diet plan recommended for DM is good for the prevention of complications. this implies that participant had good attitude towards dietary adherence (Table 9).

For subjective norm items (social pressure) 222(57%) of participant strongly agreed that it is expected for them to follow their diet plan and 11(2.9%) strongly disagreed. 114(29%) of respondent strongly feels that they are under social pressure for following their diet recommended for diabetes and 53(14%) were disagreed. This indicates that more than half of participant feels under social pressure for following their daily diet plan (Table 10).

Participant response for perceive behavioral control items 128(33%) strongly agreed that they are confident that they can regularly follow their daily diet, 123(32%) agreed, 97(27%) neither 12(3%) disagreed and 25(6.5%) strongly disagreed (Table 11).

Summary of direct items of theory of planned behavior variables

Theory of planned behavior model was measure using five point Likert Scale response format range from 3-4 measurement items. Mean, standard deviation and internal consistency were calculated. Direct attitude 13(SD±2.5), direct subjective norm 16 (SD±2.9), and perceived behavioral control had a mean score of 14(SD±4). The mean score of intention was 13 (SD±2.6) (table-2).

Table 2: Summery of direct items of theory of planned behavior and internal consistency among DM patients in Tikur Anbesa Hospital, Addis Ababa Ethiopia, 2020

Components	N	Numbers of items	Scale range Min-max	Scale mean	SD	Item mean	Chrombach's alpha α
Attitude	385	3	3_15	13	2.5	4.4	0.975
SN	385	4	5_20	16	2.9	4	0.607
PBC	385	4	5_20	14	4	3.6	0.870
Intention	385	3	3_15	13	2.9	4.3	0.947

Abbreviations:SN subjective norm: PBC perceived behavioral control

(α) Score of ≥0.6; acceptable measure of internal consistency of items on the scale

5.3.2. indirect items of theory of planned behavior

5.3.2.1.Behavioral belief and behavioral outcome evaluation measurement item

Indirect attitude towards healthy diet adherence was measured using 8 items with 5 point likert scale response format. Indirect attitude contains 4 items of behavioral beliefs questions with the corresponding 4 items of evaluation of outcome.

Based on participants response 263 (68.3%) strongly agreed that following their daily recommended diet will prevent them from complications associated with diabetes,137 (37%) strongly agreed that following their diet will prevent them from eating whatever they like to eat, 270 (67%) strongly agreed that following their diet will help to control their glucose level. Among the participant 209 (54%) following their daily recommend diet plan is extremely desirable.67 (17%) feels that prevented from diet that are not allowed for diabetes patients is

extremely undesirable while 88 (22%) feels extremely desirable and 172 (45%) following their diet to control blood glucose was extremely desirable(Table 12).

5.3.2.2.Normative belief and outcome evaluation measurement items

Indirect items of subjective norm were measured using 8 items with five point likert scale response format. Indirect item subjective norm contains four items of normative belief with its corresponding four items of motivation to comply.

From Participant response 258 (67%) strongly agreed that their family members thinks that they should regularly follow their diet plan, 212 (55%) strongly agreed that their friends and 295 (77%) their doctors think they should regularly follow their diet plan recommended to diabetes. 173 (45%) strongly agreed that other diabetes patient follow their diet regularly.

On the other hand 256 (66%) of participant strongly agreed that getting approval fromtheir family members for following their diet plan is important, 248 (64%) participant of the study strongly agreed that their friends approval is important, 273 (71%) strongly agreed their doctors approval is important and 121 (55%) strongly agreed that other DM patients approval is important (Table 13).

5.3.2.3. Control belief and perceived power of control belief measurement items

Indirect perceived behavioral control towards dietary adherence was measure using 8 items with five point likert scale response format indirect PBC contain control belief with four items with its corresponding perceived control power with four items. According to participant response 187 (48%) strongly agreed and 64 (16%) of respondent strongly disagreed that insufficient income will make it difficult to follow recommended diet plan for diabetes.153 (39.7%) strongly agreed that feeling sentimental while attending social gathering will make it difficult to follow recommended diet plan while 85 (22%) strongly disagreed, 180 (47%) strongly agreed that traveling will make it difficult to follow recommended diet and 152 (39.3%) strongly agreed that lack time to prepare food will make it difficult to follow diet plan.

Among the respondent 132 (34%) strongly disagreed that they are less likely to follow their diet when they have insufficient income, 80 (20.8%) disagreed and 35 (9%) agreed they are less likely to follow their diet when they have insufficient income,108 (28%) neither agreed or disagreed. 128(33%) strongly disagreed that they are less likely to follow their diet plan when

they feel sentimental during social gathering 113 (29%) responded neither agreed or disagreed(Table 14).

Summary of indirect items of theory of planned behavior

Indirect items of attitude, subjective norm and PBC was measure by five point liker scale the response format 8 for each constructs with negative and positive endpoint within the range of -40 to +40. Indirect attitude had higher mean score of 26 (SD±13),indirect subjective norm mean was 24 (SD±15) and indirect perceived behavioral control was the list of all -10 (SD±16).

This result indicates the overall attitude of the participant reflects moderate positive attitude towards dietary managements of diabetic. Indirect subjective norm result also indicates participants experience moderate positive social pressure to follow their recommended diet plan to diabetic. In contrary Indirect perceived behavioral control shows weak negative control over strictly following their diet plan.

Table 3:summery of indirect items of theory of planned behavior variables, internal consistency and test-retest reliability among DM patient in Tikur Anbesa Hospital, Addis Ababa, Ethiopia 2020

	N	Minimum	Maximum	Mean	Std. Deviation	Chrombach's alpha α	inter class correlation r
indirect attitude	385	-40	40	25.7277	12.65302	0.869	0.867
indirect subjective norm	385	-40	40	23.6468	14.71394	0.959	0.953
indirect PBC	385	-40	40	-10.4675	15.75214	0.964	0.933

r= ≥ 0.7; good inter class correlation coefficient

(α) Score of ≥0.6; acceptable measure of internal consistency of items on the scale.

5.4. Analyzing mean deference between predictor variable and intention to dietary adherence

The mean difference of each socio demographic variable was calculated using parametric test. An independent T-test was conducted to determine if there is difference existed between the mean of two groups' independent variables and one-way ANOVA was done to check the existence of mean deference among three or more groups of independent variables to the intention of dietary adherence. The result of analysis indicated that on T-test there is no significance mean difference between two groups. On one-way ANOVAreligion, marital status and levels of dietary adherence had significant effect on intention toward dietary adherence.

Marital status ($F(3,375) = 4.963$, mean square =25.197, $P < 0.01$). The mean value indicate that never married had less intention towards dietary adherence. (n= 37, M= 12.08) than married (n = 267 M = 13.32), Divorce (n =33, M = 13.57) and widowed (n = 42, M = 13.95). Religion ($F(3,375) = 4.117$, mean square = 21.37, $P < 0.01$). This mean value indicates that Muslims had less intention (n = 67, M =12.55) than orthodox (n = 218, M = 13.33) and protestant (n = 73, M =13.89). Level dietary adherence ($F(2, 376)=28.137$, mean square =128.834, $P <0.001$). This mean value indicates that patients with high level of dietary adherence had high intention towards intention for dietary adherence (n=70, M= 14.65) than medium level of dietary adherence (n=119, M= 13.70) and low level of dietary adherence (n=190, M= 12.54) (Table-4).

Table 4: **Summary of one-way ANOVA for socio-demographic variables with intention to dietary adherence among DM patient in Tikur Anbesa hospital Addis Ababa, Ethiopia 2020**

Variable	M-square	F	P – value	Effect size
Marital status	25.197	4.963	P< 0.01	0.38
Religion	21.37	4.117	P< 0.01	0.32
Level of dietary adherence	128.834	28.137	P< 0.001	0.13

5.6 theory of planned behavior Correlation analysis between direct and indirect items

Bivariate correlation was done between direct and indirect measures of TPB construct and out-come variables using karl pearsone (r) correlation to show the strength of relationship each construct with other construct. karl pearsone coefficient shows that there is only a positive relationship among the constructs. Attitude found to be statistically significant and moderately positive (r= 0.417, p < 0.001) with direct attitude explaining 17% of the variation in indirect attitude and the correlation between direct and indirect subjective norm also significant and moderately positive correlation (r=0.337, p <0.001) with direct subjective norm explaining 11 % of the variance in indirect subjective norm. Between direct and indirect PBC (r= 0.288, p<0.001) which was weak positive correlation (table-5).

Table 5: correlation matrix of theory of planned behavior constructs on intention toward dietary adherence among DM patient in tikur anbesa hospital, Addis Ababa, Ethiopia, 2020.

	1	2	3	4	5	6	7
intention	1						
attitude	.489**	1					
subjective norm	.460**	.428**	1				
PBC	.522**	.385**	.461**	1			
indirect attitude	.451**	.417**	.390**	.430**	1		
indirect PBC	.129*	.113*	.151**	.288**	0.076	1	
indirect subjective norm	.383**	.339**	.337**	.400**	.947**	0.093	1

**. Correlation is significant at the 0.01
*. Correlation is significant at the 0.05.
PBC; perceived behavioral control.1 intention, 2 attitude, 3subjective norm, 4 perceive behavioral control, 5 indirectattitude, 6 indirect perceived behavioral control, 6 indirect subjective norm.

5.7. Linear regression analysis

5.7.1. Simple linear regression

After checking assumption of linear regression using histogram for normality of distribution, linearity by probability plot, autocorrelation by Durbin-Watson and presence of relationship by scatter plot. Bivariate linear regression was done on variables fulfilled the assumption.

Socio-demographic and dietary adherence variables

Bivariate regression analysis was done on socio-demographic and dietary adherence variables and most of the variables were not statistically significant. Educational status from college and above (ß = 0.731, P <0.01, CI = 0.169 – 1.293) and high levels of dietary adherence (ß=1.667, P < 0.001, CI = 1.095 – 2.239) were found to be statistically significant in predicting intention.

TPB model predictor variable with intention toward dietary adherence

Bivariate regression analysis was done on direct items of TPB model explanatory variables to determine statistically significance of the variable for prediction of intention for dietary adherence. The analysis shows that perceived behavioral control (ß = 0.30, P <0.001, CI = 0.251 – 0.351), attitude (ß = 0.483, P< 0.00, CI=0.396 – 0.571) and subjective norm (ß = 0.37, P <0.001, CI= 0.303 – 0.450) were highly statistically significant in predicting intention to dietary adherence. 27% of variance in predicting intention to dietary adherence was explained by perceived behavioral control(table-6).

Table 6: Bivariate analysis of direct items of TPB independent variables in predicting intention for dietary adherence among DM patient in Tikur Anbesa hospital Addis Ababa, Ethiopia 2020

Variables			95% CI			
	ß	P-value	upper	lower	R^2	Adj. R^2
PBC	0.301	< 0.001	0.251	0.351	0.272	0.270
attitude	0.483	< 0.001	0.396	0.571	0.212	0.210
SN	0.37	< 0.001	0.303	0.450	0.239	0.237

Adj.R^2 = adjusted R-square, ß= unstandardized regression coefficient, PBC= perceived behavioral control, SN = subjective norm

5.7.2 Multiple linear regression analysis

In the final multiple linear regression model the variables which are statistically significant with P-value < 0.25 in bivariate analysis were entered. Educational status and level of dietary adherence were significant in bivariate analysis but this variable lost their significance in multiple regressions.

Theory of planned behavior constructs attitude, subjective norm and perceived behavioral control significantly predicted intention for dietary adherence by 39% (R^2 =0.402, Adj.R^2 = 0.387, P< 0.001). Attitude (β= 0.288, P <0.001, CI = 0.190,0.369), perceived behavioral control (β= 0.283, P < 0.001, CI= 0.110, 0.222) and subjective norm (β= 0.191, P<0.001, CI=0.078-0.230). This means one standard deviation increase on attitude towards advantage of following recommended diet will increase the intention toward dietary adherence by 0.288 while keeping other variables constant. Also one standarddeviation increase on perceived control towards following recommended diet will change intention for dietary adherence by 0.283. In addition to this one standard deviationincrease on subjective norm for dietary adherence will increase on intention by 0.191 while keeping other variables constant.

Table 7: Multivariable regression analysis of intention towards dietary adherence among DM patients in Tikur Anbesa hospital, Addis Ababa, Ethiopia, 2020

Variables					95% CI	
		ß	β	P-value	lower	upper
Educational status	Unable to write and read (ref)					
	read and write	-0.133	-0.017	0.788	0.836	-0.101
	primary school	-0.315	-0.062	0.445	0.496	-1.127
	high school	-0.344	-0.075	0.393	0.447	-1.135
	college and above	-0.045	-0.008	0.916	0.795	-0.886
Level of dietary adherence	Low adherence(ref)					
	high adherence	0.422	0.073	0.135	0.976	-0.132
	medium adherence	0.318	0.066	0.147	0.748	-0.112
Direct items of TPB	attitude	0.279	0.288	0.000*	0.369	0.190
	subjective norm	0.154	0.191	0.000*	0.230	0.078
	perceived behavioral control	0.166	0.283	0.000*	0.221	0.110

ß = Unstandardized regression coefficient, β = Standardized regression coefficient

R^2 =0.402, adjusted R^2 = 0.387, F changer 27.351, P< 0.001

6. Discussion

Clinical and epidemiological studies have shown that health diet habit among diabetes patient reduce the risk of developing complications and mortality. This study use theory of plan behavior constructs to predictintention for healthy diet adherence among diabetes patients. The finding of this study indicated that participant had high intention toward dietary adherence (M= 13, SD=2.9).Theory of planned behavior found to be useful in predicting intention towards recommended dietary adherence among type two diabetic patients and constructs of TPB attitude, subjective norm and perceive behavioral control also predicts intention by 39% (R^2 =0.402, Adj.R^2 = 0.387, P< 0.001).. In this study attitude was a strong predictor of intention.The correlation between direct and indirect items were positively correlated.

There was no significant association between socio-demographic characteristics and intention towards dietary adherence, and also between level of dietary adherence and intention towards dietary adherence. this finding is in line with study from USA on health eating age, gender, grade and BMI were not associated with intention(31). This implies that the prediction of attitude, subjective norm and perceive behavioral control is not different among various categories of socio-demographic characteristics of participants and level of dietary adherence.in contrast study conducted in England among young college student gender, employment status and year of study were associated with intention(32). The difference could be due to participant's age deference, studies settings and health status.

This study investigates TPB in predicting intention towards dietary adherence. Intention was significantly predicted by perceived behavioral control (R^2=0.272), subjective norm (R^2=0.239) and attitude (R^2=0.212) simultaneously. This three TPB constructs aloneable to explain 38.9% variance (R^2=0.394, Adj.R^2=0.38.9) in intention towards dietary adherence in terms of Adj.R^2.

This finding is similar with various studies conducted on diet and physical activity behavior using TPB model. Meta-analysis on predicting health related behavior showedhealthy diet and physical activity behavior 21% and 23.9% variance were the highest comparing to other health related behavior. Study from USA on sugar and sweetened beverage 32%, predicting snack food consumption boys 55.9% and girls 43.3% and study from Canada on diabetes on physical activity 40% of variance in explaining intention(8, 23, 25, 33).

In the final model standardized regression coefficient indicated that intention for dietary adherence was mainly influenced by attitude followed by Perceive behavioral control and subjective norm was the last to influent intention towards dietary adherence. Consistent with our finding study conducted on predicting dietary practice on type two diabetics attitude was the most powerful determinant of intention. Systematic review and meta-analysis on application of theory of planned behavior on health related behavior also indicated that attitude was stronger predictor of intention (23, 24, 34). This implies that diabetes patient's favorable attitude towards dietary adherence will lead them to adhere to their diet. An Intention to perform behavior is influenced by attitude towards action including the individual positive or negative behavioral beliefs and evaluation of out-come of the behavior(7). However study conducted on intention to eat healthy diet on persons at risk of diabetes in USA showed that perceive behavioral control were more important predictor of intention(9). This study differs from ours this could be due to population difference and self-identified for diabetes risk volunteers were only participated.

In this study multivariable standardize regression coefficient showed perceived behavioral control was the second important predictor of intention towards dietary adherence. This means participant who are confident to follow their daily diet plan recommended to DM had high intention for dietary adherence. In contrast to this study conducted on intention for snack food consumption perceive behavioral control was the second predictor of intention(8). On study conducted on intention for physical activity among type two diabetes Perceive behavioral control was primary predictor of intention for physical activity(30). However study form Kenya on dietary behavior among type two diabetes patient perceive behavioral control was insignificant predictor of intention(34). The reason for this could be due to the difference in target population, context, type of action and time.

Indirect item of perceive behavioral control indicate that participant had poor control over dietary adherence. „inefficient income, felling sentimental on social gathering, traveling and lack of time to prepare food" were stated during elicitation study. Theory of planned behavior was criticized that does not consider political, economic and environmental barrier and therefore limited in the scope. But the premises of TPB is that peoples cognition are formed from situations in the persons environment and the variables external to the model affect the behavior indirectly through the variables specified in the theory(35).

In line with the study from Iran on predicting dietary behavior of type two diabetics and study from USA intention for healthy diet on risk for diabetes patient (36), the present study indicate that subjective norm was the third important and statistically significant predictor intention toward dietary adherence. Important others for diabetes patient in this study were families, friends, doctors and other DM patients. This indicate that diabetics patients social pressure toward health diet have a greater role in leading them to follow their diet plan recommended to diabetics. Other studies also showed that subjective norm was statistical significant predictor of intention but in differing to our finding subjective norm was second significant predictor of intention (30, 34).

On the correlation analysis, it was indicated that there is direct positive relationship between direct and indirect items measurements of theory of planed behavior. This indicates taking out the commonly held beliefs regarding to attitude, subjective norm and perceived behavioral control explained through the indirect constructs of each measurement. This means indirect measures directly influence attitude, subjective norm and PBC towards dietary adherence. This is in parallel with the principle of TPB(22), this implies that commonly held silent beliefs of the behavior was well explored and intervention can be designed on the silent beliefs or indirect items identified during the elicitation stu

7. Strength and limitation

- **Strength:** this study did elicitation study for exploring silent beliefs to design appropriate survey instrument to measure TPB constructs.
- **Limitation**:
- TPB has a limitation of reciprocal determination of the outcomes of intention on the explanatory variables.
- Since the study was conducted at the follow up clinic there may be a social desirability bias.
- Another limitation of the study was Cross sectional nature of the study, intention was the outcome variable instead of prospective behavior.

8. Conclusion and recommendation

Conclusion

This study revealed that theory of planned behavior is useful to explain and predict intention towards dietary adherence among diabetic patients. Intention for dietary adherence was a function of attitude, subjective norm and perceived behavioral control. Intention for dietary adherence was mainly influence by attitude and perceived behavioral control. Important common beliefs of TPB had influence on direct attitude, subjective norm and perceived behavioral control. Socio-demographic and level of dietary adherence were not influencing intention for dietary adherence among diabetics. Health education and promotion program should focus on bringing a positive attitude and increase self-confidence toward healthy eating among diabetes patients.

Recommendation

Regional health bureau and wored health offices: to prepare diabetes patient education materials and programs using various media outlets on theadvantages of adhering to recommended diet, by involving important peoples and groups to support and approve patients diet plan and educating patients on the easiness of following their daily diet plan by involving local and regional leaders, local health centers, health professionals and diabetes patients.

Researchers: there is a gap on evidence on this aria of study, further research's needs to be done on diabetes patient dietary behavior using health education theory and models. To improve the predicting ability of intention toward dietary adherence it is better to incorporate other theoretical modes on theory of planned behavior constructs.

9.References

1. 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 endocrine disorders. 2016;16(1):28.
2. Williams R, Colagiuri S, Chan J, Gregg E, Ke C, Lim L-L, et al. IDF Atlas 9th Edition 20192019.
3. Ogurtsova K, JDdRF, Y. Huanga, U. Linnenkamp , L. Guariguataa, N.H. Choa, et al. IDF Diabetes Atlas: Global estimates for the
prevalence of diabetes for 2015 and 2040. dia bet es rese ar ch a n d c li nic a l p ra ct ice. 2017.
4. Gill GV, Mbanya J-C, Ramaiya KL, Tesfaye S. A-Sub-Saharan-African-perspective-of-diabetes. SpringerPlus. 2008.
5. Ketema DB, Leshargie CT, Kibret GD, Assemie MA, Alamneh AA, Kassa GM, et al. Level of self-care practice among diabetic patients in Ethiopia: a systematic review and meta-analysis. BMC Public Health. 2020;20(1):309.
6. Worku. A, Mekonnen S, Molla A., Wassie W. Dietary practice and associated factors among type 2 diabetic patients: a cross sectional hospital based study, Addis Ababa, Ethiopia. SpringerPlus. 2015.
7. Ajzen I. Attitudes, Traits, and Actions: Dispositional Prediction of Behavior in Personality and Social Psychology. In: Berkowitz L, editor. Advances in Experimental Social Psychology. 20: Academic Press; 1987. p. 1-63.
8. Branscum P, Sharma M. Comparing the Utility of the Theory of Planned Behavior Between Boys and Girls for Predicting Snack Food Consumption: Implications for Practice. Health promotion practice. 2013;15.
9. Blue CL. Does the theory of planned behavior identify diabetes-related cognitions for intention to bephysically active and eat a healthy diet? Public Health Nursing. 2007;24(2), 141-150.
10. Asnakew S, Misganaw C, Hawult A, Adane T. Assessment of the level and associated factors with knowledge and practice of Diabetes Mellitus among Diabetic Patients attending at FelegeHiwot Hospital,Northwest Ethiopia. Clinical Medicine Research. 2013;2.
11. taye A, Wondemagegn. Undiagnosed diabetes mellitus and related factors in East Gojjam. jornal of pulic health. 2017;6.
12. Gizaw M, Harries A.D, Ade S, Tayler-Smith K, Ali E, Firdu N, et al. Diabetes mellitus in Addis Ababa, Ethiopia: admissions, complications and outcomes in a large referral hospital. Public Health Action. 2015;5.
13. Worku D, Hamza L, Woldemichael K. Patterns of diabetic complications at jimma university specialized hospital, southwest ethiopia. Ethiop J Health Sci. 2010;20(1):33-9.
14. Bonger Z, Shiferaw S, Zerihun E. Adherence to diabetic self-care practices and its associated factors among patients with type 2 diabetes in Addis Ababa, Ethiopia. open access to scientific and medical research. 2018.
15. Mulugeta y, Tefera A, Aragaw A. Dietary practice and associated factors among type 2 diabetic patients in Felege HiwotRegional Referral Hospital, Bahir Dar, Ethiopia. BMC 2018.
16. Mohammed AS, Adem F, Tadiwos Y, Woldekidan NA, Degu A. Level of Adherence to the Dietary Recommendation and Glycemic Control Among Patients with Type 2 Diabetes Mellitus in Eastern Ethiopia: A Cross-Sectional Study. Diabetes, metabolic syndrome and obesity : targets and therapy. 2020;13:2605-12.
17. Ayele K, Tesfa B, Abebe L. Self Care Behavior among Patients with Diabetes inHarari, Eastern Ethiopia: The Health Belief Model Perspective. PLoS ONE. 2012;7:4.
18. Wako A, Belay S, Feleke Y, kebede T. Assessment of the Magnitude, Severity and Associated Factors of Hypoglycemia in Diabetic Patients Attending National Diabetes Referral Clinic at Tikur Anbessa Hospital, Addis Ababa, Ethiopia. Journal of Diabetes & Metabolism. 2017;08(05).
19. Rohani H, Malekahmadi M, Bidkhori M, Ali Eslami A, Raei M, Ghaderi A, et al. Predicting dietary behavior of type 2 diabetics: Application of the theoryof planned behavior and perceived risk of diabetes complications construct.
20. Rahmati-Najarkolaei F, Pakpour MH, Saffari M, Hosseini MS, Hajizadeh F, Chen H, et al. Determinants of Lifestyle Behavior in Iranian Adults with Prediabetes: Applying the Theory of Planned Behavio. Archives of Iranian Medicine. 2017;20.
21. D.O. Omondi, M.K. Walingo, G.M. Mbagaya, L.O.A., Othuon. Advancing the Theory of Planned Behavior within Dietary and Physical Domains among Type 2 Diabetics: A Mixed Methods Approach. International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering. 2010;4:1598-606.
22. Ajzen I. The theory of planned behavior. Organizational Behavior and Human Decision Processes. 1991;50(2):179-211.

23. McEachan R, Conner M, Taylor N, Lawton R. Prospective Prediction of Health-related Behaviours with the Theory of Planned Behaviour: A Meta-analysis. Health Psychology Review. 2011;5:97.
24. Armitage CJ, Conner M. Social cognition models and health behaviour: A structured review. Psychology & health. 2000;15(2):173-89.
25. Plotnikoff RC, Lippke S, Courneya K, Birkett N, Sigal R. Physical activity and diabetes: an application of the theory of planned behaviour to explain physical activity for Type 1 and Type 2 diabetes in an adult population sample. Psychology & health. 2010;25(1):7-23.
26. Morowatisharifabad MA, Abdolkarimi M, Asadpour M, Fathollahi MS. Predicting Dietary Practice Behavior among Type 2 Diabetics Using the Theory of Planned Behavior and Mixed Methods Design. International Journal of Medical, Health, Biomedical, Bioengineering and Pharmaceutical Engineering. 2011;5:283-92.
27. Avery L, Flynn D, van Wersch A, Sniehotta FF, Trenell MI. Changing Physical Activity Behavior in Type 2 Diabetes. A systematic review and meta-analysis of behavioral interventions. 2012;35(12):2681-9.
28. Jeihooni A, Askari A, Kashfi S, Marzban A, Khiyali Z. The effect of educational program based on belief, attitude, subjective norm, and enabling factors model on changing the metabolic indices in elderly patients with type II diabetes. International Journal of Preventive Medicine. 2018;9(1):74.
29. White KM, Terry DJ, Troup C, Rempel LA, Norman P, Mummery K, et al. An Extended Theory of Planned Behavior Intervention for Older Adults with Type 2 Diabetes and Cardiovascular Disease. Journal of Aging and Physical Activity. 2012;20(3):281-99.
30. Boudreau F, Godin G. Understanding physical activity intentions among French Canadians with type 2 diabetes: an extension of Ajzen's theory of planned behaviour. The international journal of behavioral nutrition and physical activity. 2009;6:35.
31. Fila SA, Smith C. Applying the Theory of Planned Behavior to healthy eating behaviors in urban Native American youth. International Journal of Behavioral Nutrition and Physical Activity. 2006;3(1):11.
32. Poobalan AS, Aucott LS, Clarke A, Smith WCS. Diet behaviour among young people in transition to adulthood (18–25 year olds): a mixed method study. Health Psychology and Behavioral Medicine. 2014;2(1):909-28.
33. Zoellner JM, Porter KJ, Chen Y, Hedrick VE, You W, Hickman M, et al. Predicting sugar-sweetened behaviours with theory of planned behaviour constructs: Outcome and process results from the SIPsmartER behavioural intervention. Psychology & health. 2017;32(5):509-29.
34. Omondi DO, MKW, GMM, L.O.A., Othuon. Predicting Dietary Practice Behavior among Type 2 Diabetics Using the Theory of Planned Behavior and Mixed Methods Design. International Journal of Medical, Health, Biomedical, Bioengineering and Pharmaceutical Engineering. 2011;5:283-92.
35. Vallerand R, Deshaies P, Cuerrier J-P, Pelletier L, Mongeau C. Ajzen and Fishbein's Theory of Reasoned Action as Applied to Moral Behavior: A Confirmatory Analysis. Journal of Personality and Social Psychology. 1992;62:98-109.
36. Rohani H, M Malek , Malekahmadi M, Eslami AA, Ghaderi A. Predicting dietary behavior of type 2 diabetics: Application of the theory of planned behavior and perceived risk of diabetes complications construct cdjornal. 2015;3.

10. Annexes

Annex 1: tabular presentation of descriptive statistic for direct and indirect items of TPB

Table 8: frequency and percentages of responses for intention items among DM patients in Tikur Anbesa Hospital Addis Ababa, Ethiopia, 2020

	strongly disagree	**disagree**	neutral	agree	Strongly agree
It is expected from me to regularly follow my daily diet plane recommended to diabetes to prevent me from complications in future.	8(2.1%)	5(1.3%)	43(11.2%)	94(24.4%)	235(61.0%)
I want to regularly follow my daily diet plan recommended to diabetes to prevent me from complications in next in future.	8(2.1%)	8(2.1%)	51(13.2%)	89(23.1%)	229(59.5%)
I intend to regularly follow my daily diet plan recommended to diabetes to prevent me from complications in next in future.	6(1.6%)	9(2.3%)	49(12.7%)	93(24.2%)	228(59.2%)

Table 9 frequency and percentages of responses for attitude items among DM patients in Tikur Anbesa Hospital Addis Ababa, Ethiopia, 2020

Variables	Very harmful	harmful	neutral	beneficial	Very beneficial
For me regularly following up my daily diet plan recommended to diabetes is commendable to protect me from complications is	4(1.0%)	2(0.5%)	63(16.4%)	69(17.9%)	247(64.2%)
	Very worthless	worthless	neutral	Useful	Very useful
	4(1.0%)	2(0.5%)	63(16.4%)	70(18.2%)	246(63.9%)
	Very bad	bad	neutral	good	Very good
	4(1.0%)	4(1.0%)	62(18.2%)	62(16.1%)	245(63.6%)

Table 10 frequency and percentages of responses for subjective norm items among DM patients in Tikur Anbesa Hospital Addis Ababa, Ethiopia, 2020

Variables	strongly disagree	disagree	neutral	agree	strongly agree
It is expected of me to regularly follow my daily diet plan recommended to diabetes to prevent complication	11(2.9%)	7(1.8%)	40(10.4%)	105(27.3%)	222(57.7%)
I feel I am under social pressure to regularly follow my daily diet plan recommended to diabetes	53(13.8%)	40(10.4%)	94(24.4%)	84(21.8%)	114(29.6%)
People who are important to me want me to regularly follow diet plan recommended to diabetes	6(1.6%)	8(2.1%)	36(9.4%)	108(28.1%)	227(59.0%)
Most people who are important to me think that I should regularly follow my daily diet plan recommended to diabetes to prevent complication	40(10.4%)	17(4.4%)	51(13.2%)	42(23.9%)	185(48.1%)

Table 11 frequency and percentages of responses for PBC items among DM patients in Tikur Anbesa Hospital Addis Ababa, Ethiopia, 2020

Variables	strongly disagree	disagree	neutral	agree	strongly agree
I am confident that I can regularly follow my daily diet plane recommended to diabetes	25(6.5%)	12(3.1%)	97(25.2%)	123(31.9%)	128(33.2%)
For me to regularly follow my daily dietary plan daily diet recommended to diabetes is	Very difficult	difficult	neutral	easy	Very easy
	72(18.7%)	41(10.6%)	111(28.8%)	70(18.2%)	91(23.6%)
The decision to regularly follow my daily diet plan recommended to diabetes is under my control	Strongly disagree	agree	neutral	agree	Strongly agree
	25(6.5%)	20(5.2%)	112(29.1%)	108(28.1%)	120(31.2%)
following my daily diet plan recommended to diabetes is entirely up to me	26(6.8%)	20(5.2%)	108(28.1%)	99(25.7%)	132(34.3%)

Table 12: frequency and percentage of responses of participant for measurement items on behavioral belief and outcome evaluation (N= 385) among diabetes patients in Tikur Anbesa hospital, Addis Ababa , Ethiopia, 2020

Variables Behavioral belief	Strongly disagree	disagree	neutral	Agree	Strongly agree
If I regularly following up my daily diet plan recommended to diabetes I feel like preventing complications that are related to diabetes mellitus	9 2.3%	5 1.3%	31 8%	77 20%	263 68.3%
If I regularly following up my daily diet plan recommended to diabetes it will prevent me from eating and drinking whatever I want	63 16%	27 7%	82 21.3%	76 19.7%	137 35.6%
If I regularly following up my daily diet plan recommended to diabetes it will help me to control my glucose level	10 2.6%	4 1%	39 10%	72 18%	260 67.5%
If I regularly following up my daily diet plan recommended to diabetes It makes me feel like am different form others	90 23.4%	41 10.6%	82 21.3%	70 18.2%	102 26.5%
Outcome evaluation	Extremely undesirable	undesirable	Neutral	Desirable	Extremely desirable
For me regularly following up my daily diet plan recommended to diabetes prevent complications is	17 4.4%	11 2.9%	48 12.5%	100 26%	209 54.3%
For me prevented from foods that are not allowed to eat for diabetes is	67 17.4%	27 7%	125 32.5%	78 20.3%	88 22.9%
For me regularly following my daily diet plan recommended to diabetes to control my glucose level is	33 8.6%	13 3.4%	76 19.7%	91 23.6%	172 44.7%
For me following deferent diet plan from others is	67 17.4%	35 9%	120 31.2%	71 18.4%	92 23.9%

Table 13: frequency and percentage of responses of participant for measurement items normative belief and motivation to comply (N= 385) among diabetes patients in Tikur Anbesa hospital, Addis Ababa, Ethiopia, 2020

Normative belief	Strongly disagree	Disagree	Neutral	agree	Strongly agree
My family members thinks that I should regularly follow up my daily diet plan recommended to diabetes	23	8	38	58	258
	6%	2%	9.9%	15%	67%
My friends thinks that I should regularly follow my daily diet plan recommended to diabetes	33	9	64	67	212
	8.6%	2.3%	16.9%	17.4%	55%
My doctors thinks that I should regularly following up my daily diet plan recommended to diabetes	2	1	25	62	295
	5%	0.3%	6.5%	16%	76.6%
Other diabetes patient follow there daily diet plan recommended to diabetes	33	19	85	75	173
	8.6%	4.9%	22.1%	19.5%	44.9%
Motivation to comply	Strongly disagree	Disagree	Neutral	agree	Strongly agree
My family members approve of me regularly following my daily diet plan recommended to diabetes is important to me	4	2	27	96	256
	1%	0.5%	7%	24.9 %	66.5%
My friends approve of me regularly following my daily diet plan recommended to diabetes do matters to me	8	2	48	76	248
	2%	0.5%	12.55	20.5%	64.4%
My doctors approve of me regularly following my daily diet plan recommended to diabetes is important to me	6	3	29	74	273
	1.6%	0.8%	7.5%	19.2%	70.9%
Doing what other diabetes patient do is important to me	16	7	60	90	212
	4.2%	1.8%	15.6%	23.4%	55%

Table 14:Frequency and percentage of responses of participant for measurement items control belief and perceived power control (N= 385) among diabetes patients in Tikur Anbesa hospital, Addis Ababa, Ethiopia, 2020

Control belief	Strongly disagree	Disagree	Neutral	agree	Strongly agree
Insufficient income will make it difficult to follow daily diet plan recommended to diabetes	64 16.6%	32 8.3%	40 10,4%	62 16%	187 48.6%
Feeling sentimental while attending social gathering will make it difficult to follow daily diet plan recommended to diabetes	85 22.1%	28 7.7%	59 15.3%	60 15.9%	153 39.7%
traveling out will make it hard to follow daily diet plan recommended to diabetes	57 14.8%	24 6.2%	56 14.3%	68 17.7%	180 46.8%
Lack of time to prepare foods that are recommended to diabetes will make it difficult to follow daily diet plan	81 21%	31 8%	70 18.2%	51 13.2%	152 39.5%
power control	**Strongly disagree**	**Disagree**	**Neutral**	**agree**	**Strongly agree**
When I have Insufficient income I am less likely to follow my daily diet plan recommended to my condition	132 34.3%	80 20.8%	108 28%	30 7.8%	35 9%
When I Felling sentimental in social gathering I am less likely to follow my daily diet plan recommended to my condition	128 33.2%	79 20.5%	109 28.3%	37 9.6%	32 8.3%
When I am traveling out I am less likely to follow my daily diet plan recommended to my condition	120 31.2%	88 22.9%	113 29.4%	32 8.3%	32 8.3%
When I faced with Insufficient time to prepare food I am less likely to follow my daily diet plan recommended to my condition	110 28.6%	89 23%	114 29.6%	42 10.9%	30 7.8%

Annex 2: questionnaire

Background and information sheet

Dear Participant: My name is _____ and I am here to collect data on "**intention on dietary control of blood glucose level among type two diabetes patients** for the purpose of research". I would like to ask questions on your dietary behavior and associated factors.

Purpose of the study diabetes patient often face challenge in following to their diet plan and this study aims to find out that are affecting diabetes patient to follow their diet plan and it will provide information to prepare health education strategy for diabetic patients.

Process of the study this study include type two diabetics patients and the you are selected randomly.

Rights of the participants: your participation in this study is voluntary. You have the full right either to participate in this study or decline to participate at all. You do not have to answer any question that you don't want to answer and you may also decide not to participate in this study any time you want. But, your honest response to each question will have a major role in attaining the objective of this study.

Confidentiality of the study: You do not have to write yournamesin the questionnaire instead it will use codes to differentiate the responses you gave from another participant and the name of the institution you are working will not be mentioned .this data will not be used for any purposes other than to achieve the objectives of this study.

Benefit of the study: By participating in this study you will not get directly benefits or get payment but as it was mentioned above your complete and honest answer will have useful input in the efforts of preventing breast cancer.

Risk of the study: Participating in this study will not have any kind of risks and the researcher is accountable that by deciding to participate in this study you will not get and harm and completing this questionnaire can take about 20 to 30 minutes of your time and we greatly appreciate your cooperation. If you have any question which is not clear for you, you welcome to ask at any time.

Informed Consent

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

A) Yes

B) No If yes, I will continue and If no I will skip to next participant after writing the reasons of refusal ——————————— ——————————————————————————————

Respondent Signature _____Date_____

Data collector Name_____ Signature_____

Questionnaires ID number_____

Date of data collected_____

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

Checked by Supervisor: Name _____Signature_____

For further explanation use the Principal Investigators Address; Name: Ayub aman

Email: atklet@gmail.com Cell phone: +251 911857235

PARTONE. Questionnaire for qualitative elicitation study

1. What do you believe the advantages of regularly follow your diet plan recommended to your condition diabetes?

2. What do you believe the disadvantages of regularly follow your diet plan recommended to your condition diabetes?

3. Is there anything else you associate with regularly follow your diet plan as it recommended to your condition diabetes ?

4. Are there any individual or groups who would approve of you regularly follow your diet plan as it recommended to your condition diabetes ?

5. Are there any individual or groups who would disapprove of you regularly follow your diet plan as it recommended to your condition diabetes ?

6. Is there anything else you associate with other people's views about you regularly follow your diet plan as it recommended to your condition diabetes ?

7. What factors or circumstances would make it difficult or impossible for you to regularly follow your diet plan as it recommended to your condition diabetes ?

8. Are there any other issues that come to mind when you think about your eating as recommended to your condition or disease?

8. What do you say about your intention for regularly follow your diet plan as it recommended to your condition diabetes ?

PART TWO. Socio demographic characteristics

S.no	Variable	Answer	Remark
1.	What is your age in complete year?	_____years	
2	What is your ethnicity?	1. male 2. female	
3	What is your religion?	1. Islam 2. Orthodox 3. Protestant 4. Other(specify-------)	
4	What is your educational status?	1 Illiterate 2 Read and write 3 Grade 1 – 8 4 Grade 9–12 5 College and above	
5	What is your current occupation?	1. Employed 2. None employed 3. Retired	
6	What is your current marital status?	1. Single 2. Married 3. Divorced 4. Widowed	
6	What is your average monthly income in birr?	1. 0 - 500 birr 2. 600 – 1000 birr 3. 1001—2000 birr 4. 2001 – 3000 birr 5. More than 3001 birr	

7	Where do you permanently live?	1. Addis Ababa 2. Around Addis Ababa 3. Form rural area	
8	How many years is it since you have been diagnosed?	1. 1 year 2. 2 years 3. 3-5 years 4. 5- 10 years 5. More than 10 years	
9	Is there a family history of diabetes	1. Yes 2. No	

Part three dietary adherence measurementtool

s.no	Variable	Answer	remark
1.	Do you sometimes Forgetting to plan the meals you eat ahead?	1. Yes 2. No	
2.	Did you miss your dietary plan yesterday?	1. Yes 2. No	
3.	People sometimes miss their diet plan for reasons other than forgetting.Over the past two weeks, were there any days when you did not take your dietary plan properly?	1. Yes 2. No	
4.	Do you sometimes forget to comply your dietary plan with everyday life?	1. Yes 2. No	
5	When you feel like your DM is under control, do you sometimes stop taking your dietary plan?	1. Yes 2. No	
6	Do you ever feel hassled about sticking to your dietary plan ?	1. Yes 2. No	
7.	Did you have feelings of dietary deprivation?	1. Yes 2. No	
8.	Forgetting to include fruits in your food daily ?	1. Yes 2. No	
9.	Do you forget to include vegetables in your food daily ?	1. Yes 2. No	
10.	Do you forget to cut down butter and fat intake in your food ?	1. Yes 2. No	
	High adherence value is 0 yes Medium adherence value 1-2 Low adherence value 3- 10		

PART FOUR. Psychometric variable

Instruction: The following questions ask your intentions, attitudes, social pressures and your perceived power to eat as recommended to your condition. We are asking you to respond to the number that best represent your opinion based on degree of agreement to the given statements.

Table 15 direct item for intention

	direct item for intention	level of evaluation						
	To what extent do you agree or disagree to statement below		1	2	3	4	5	
1.	I expect to regularly follow my daily diet plane recommended to diabetes to prevent me from complications in future	Strongly disagree						Strongly agree
2.	I want to regularlyfollow my daily diet plan recommended to diabetes to prevent me from complication in future	Strongly disagree						Strongly agree
3.	I intend to regularly follow my daily diet plan recommended to diabetes to prevent me from complications in future	Strongly dis agree						Strongly agree

	direct item for attitude	level of evaluation						
	To what extent do you evaluate the following statement		1	2	3	4	5	
4.	For me regularly following up my daily diet plan recommended to diabetes is commendable to protect me from complications is	harmful						Beneficial
		Good						Bad
		Pleasant for me						Unpleasant for me
		worthless						Useful

	Behavioral belief Indirect item of attitude	level of evaluation						
	To what extent do you evaluate the following statement		1	2	3	4	5	
5.	If I regularly following up my daily diet plan recommended to diabetes I feel like preventing complications that are related to diabetes mellitus	Strongly disagree						Strongly agree
6.	If I regularly following up my daily diet plan recommended to diabetes it will prevent me from eating and drinking whatever I want	Strongly disagree						Strongly agree
7.	If I regularly following up my daily diet plan recommended to diabetes it will help me to control my glucose level	Strongly disagree						Strongly agree
8	If I regularly following up my daily diet plan recommended to diabetes It makes me feel like am deferent form others	Strongly disagree						Strongly agree

	Outcome evaluation of Indirect item of attitude	level of evaluation						
	To what extent do you evaluate the following statement		-2	-1	0	1	2	
9.	For me regularly following up my daily diet plan recommended to diabetes prevent complications to is	Extremely undesirable						Extremely desirable
10.	For me prevented from foods that are not allowed to eat for diabetes is	Extremely undesirable						Extremely desirable
11.	For me regularly following my daily diet plan recommended to diabetes to control my glucose level is	Extremely undesirable						Extremely desirable
12.	For me following deferent diet plan from others is	Extremely undesirable						Extremely desirable

	direct item for subjective norm	level of evaluation						
	To what extent do you agree or disagree to statement below		1	2	3	4	5	
13.	Most people who are important to me think that I _____ regularly follow my daily diet plan recommended to diabetes to prevent commplication	I should						I should not
14.	It is expected of me to regularly follow my daily diet plan recommended to diabetes to prevent complication	Strongly disagree						Strongly agree
15.	I feel I am uder social pressure to regularly follow my daily diet plan recommende to diabetes	Strongly disagree						Strongly agree
16.	People who are important to me want me to regularly follow diet plan recommended to diabetes	Strongly dis agree						Strongly agree

	To what extent do you evaluate the following statement		1	2	3	4	5	
17.	My family members thinks that I should regularly follow up my daily diet plan recommended to diabetes	Strongly disagree						Strongly agree
18.	My friends thinks that I shouldregularly follow my daily diet plan recommended to diabetes	Strongly disagree						Strongly agree
19.	My doctors thinks that I should regularly following up my daily diet plan recommended to diabetes	Strongly disagree						Strongly agree
20.	Other diabetes patient follow up there daily diet plan recommended to diabetes	Strongly disagree						Strongly agree

	To what extent do you evaluate the following statement		-2	-1	0	1	2	
21.	My family members approve of me regularly following my daily diet plan recommended to diabetes is important to me	Strongly disagree						Strongly agree

22.	My friends approve of me regularly following my daily diet plan recommended to diabetes do matters to me	Strongly disagree						Strongly agree
23.	My doctors approve of me regularly following my daily diet plan recommended to diabetes is important to me	Strongly disagree						Strongly agree
24.	Doing what other diabetes patient do is important to me	Strongly disagree						Strongly agree

	direct item for perceived behavioral control	level of evaluation						
	To what extent do you evaluate the following statement		1	2	3	4	5	
25.	I am confident that I can regularely follow my daily diet plane recommended to diabetes	Strongly disagree						Strongly agree
26.	For me to regualrely followe my daily diatry plan recommended to diabeties is	easy						difficult
27.	The decition to regularelly followmy daily diet plan recommende to diabetes is under my control	Strongly disagree						Strongly agree
28.	Whatever I regularly follow my daily diet plan recommended to diabetes is entirely up to me	Strongly disagree						Strongly agree

	Indirect item of PBC control belief	level of evaluation						
	To what extent do you evaluate the following statement		1	2	3	4	5	
29	Insufficient income will make it difficult to follow daily diet plan recommended to diabetes	Strongly disagree						Strongly agree
30.	Feeling sentimental while attending social gathering will make it difficult to follow daily diet plan recommended to diabetes	Strongly disagree						Strongly agree
31.	traveling out will make it hard to follow daily diet plan recommended to diabetes	Strongly disagree						Strongly agree
32.	Lack of time to prepare foods that are recommended to diabetes will make it difficult to follow daily diet plan	Strongly disagree						Strongly agree

	Indirect item of PBC power control	level of evaluation						
	To what extent do you evaluate the following statement		-2	-1	0	1	2	
33.	When I have Insufficient income I amless likely to follow my daily diet plan recommended to my condition	Strongly disagree						Strongly agree
34.	When I Felling sentimental in social gathering I am less likely to follow my daily diet plan recommended to my condition	Strongly disagree						Strongly agree
35.	When I faced with Insufficient time to prepare food I am less likely to follow my daily diet plan recommended to my condition	Strongly disagree						Strongly agree
36.	When I am traveling out I am less likely to follow my daily diet plan recommended to my condition	Strongly disagree						Strongly agree

Amharic version of questionnaire

አዲስ አበባ ዩኒቨርስቲ ጤፍ ሣይንስ ፊካሊቲ የህብረተሰብ ጤፍ አጠባበቅ ትምህርት ክፍል የተጠያቂው/የ ማላሸ ችየ ሚጃ ቅፅ

ጤፍ ይስጥልን እንደምነ ዎት

ስሜ_____ይባላል የማካሁት በአዲስ አበባ ዩኒቨርስቲ የህብረተሰብ ጤፍ አጠባበቅ የጤፍ ትምህርት እና ክፍል ለሚያደርገው የማስተርስ ዲግሪ የሞያ የጥናት እና የምርምር ስራ እየሰራ ያለውን ተማሪ አዩብ አማን ወክዬ ነው ፡ በስኳር ሕመማን የአማገብ በሃሪ እና እንዲከተሉት በሚከበቀው አማገብ ዙሪያ እና ተያያዥ ጉዳዮች ዙርያ ጥናት እያደረጉ ሲሆን ከአዲስአበባ ዩኒቨርሲቲ ፍቃድ አግኝተዋል፡ ፡ እርስዎ በዚህ ጥናት ላይ እንዲሳተፉ የተመረጡት በተደጋጋሚ በተደረገ የአጋጣሚ የናሙና አወሳሰድ ስሌት ማሳረትነው ፡ የእርስዎ ተሳትፎ ሞሉበማሉ በእርስዎ ሞሉ ፈቃደኝነ ት ላይ የተማሰረተ ነው ፡

በጥናቱ ላይ ያለማሳተፍ ሞሉ ጣበት አሎዎት፡ ፡ ለማሳተፍ ፍቃደኛ ከሆኑ በኋላምበፈለጉት ጊዜማቆም ወይም ማቋረጥ ይችላሉ፡ ፡ በጥናቱ ባለማሳተፍዎ የሚደርስቦት ምንምአይነ ት ችግር አይኖርም ፡ በጥናቱ ለማሳተፍ ከተስማሙእርስዎን አማገብበተማላከተየተወሰኑ ጥያቄዎችን እንጠይቆታለን፡ ፡ በዚህ ማኪይቅ ማሳረታዊ ሚጃ፤ ለሰኳር ህማሞተኞች እንዲማቡ በሚሞክረው አማገብ ላይ ያሎትን አመልካከት፣ በዙሪያዎ ያሉ ሰዎች በእርሶ ማገብ ላይ ያላቸውን አማላካከት; እርሶ በአማገቡን ለማከትል ያሎትን ጥንካሬበተገናኘ የሚጃ ምንጭ ሊሆኑ የሞቹሉጥያቄዎችንእጠይቅዎታለሁ፡ ፡ በማኪይቁ ጊዜ ጥሩ ስሜት ካልተሰማዎት በማንኛውም ጊዜአቋርጠውመሄድይችላሉ፡ ፡

በሜጩፈሻምከእርስዎ የምንሰበስበውሚጃ ከስምዎ ጋር አይያያዝም ፡ ስምዎት እንደሚይጠቀስ፤ ሚስጥራዊ ሆኖ እንደሞቆይ እና ለማንምአካል ተላሌፎ እንደሚሰጥልናረጋግጥልዎት እንወዳለን፡ ፡ የዚህ ጥናት ውጤት ግን ተጠርዞ እና ተዘጋጅቶ ጉዳዩ ወደሚሞላከታቹው የጤፍ ድርጅቶች ወይም ለሌሎች አካላት ሊሰጥይችላል፡ ፡

ከላይ በተገለጸውቅጽ ማስማማትዎን በፊርማዎ ያረጋግጡ_____

ሚጃውየ ተሰጠበት ቀን _____

የአጥኚ ውፊርማ _____

ለተጨማሪ ማብራሪያ የዋና አጥኚውን አድራሻ ይጠቀሙ

ስም አዩብ አማን: Atklet@gmail.com

ስልክ +251 911857235

የ ስ ምምን ት ማጠየ ቂ ያ/ሚ ሪ ገ ጫቅ ፅ
ከ ላ ይ በ ሰ ጠዎት ሚ ጃ ማጎ ረ ት በ ጥና ቱ ላ ይ ለ ማሳ ተ ፍ ፍ ቃ ደ ኛ ነ ዎት?
1. አ ዎ
2. አ ይ ደ ለ ሁ ም
ፍ ቃ ደ ኛ ካ ል ሆ ኑ ም ክ ኒ ያ ቱ ን ፅ ፈ ው ወ ደ ሜ ቋ ጥ ለ ው ተ ሳ ታ ፊ እ ለ ፍ———————————————
———
የ ተ ሳ ታ ፊ ፊ ር ማ———————ቀ ን ———————
የ ሚ ጃ ሰ ብ ሳ ቢ ስ ም———————————ፊ ር ማ———————
የ ማ ኪ ይ ቁ ቁ ጥ ር ———————— ማ ኪ ይ ቁ የ ተ ካ ሄ ደ በ ት ቀ ን ————----------

የ ማ ኪ ይ ቁ ው ጤ ት 1. ማ ለ በ ማ ሉ የ ተ ሟ ላ 2. በ ከ ፊ ል የ ተ ሟ ላ 3. ም ን ም ያ ል ተ ሟ ላ

በ ተ ቆ ጣ ጣ ሪ ዎ ች ተ ረ ጋ ግ ጧ ል ፡ ስ ም———————ፊ ር ማ————————

ክፍልአንድማነረታዊሚጃዎች

ተ/ቁ ጥር	ዝር ዝር	ሜልስ	አስተያየት
1.	እድሜዎስንትነው	_____አማት	
2.	ፆታ?	1. ወንድ 2. ሴት	
3.	ሀይሜትዎምንድንነው?	1. ኦርቶዶክስ 2.ሚስሊም 3.ፕሮትስታንት 4.ካቶሊክ 5.ልሎች (የ ግለፁት-------)	
4.	የ ትምህርትደረጃ?	1.ያለተሚረ 2.ማንበብእናመፃፍ 3. 1– 8ኛክፍል 4. 9–12ክፍል 5.ኮሌጅእናከዛበላይ	
5.	በአሁንሰአትያሎትየስራሁኔታ?	1. በስራላይ 2. ሰራፈላጊ 3.ጡረተኛ	
2.	የጋብቻሁኔታ?	1. ያላገባ 2. ያገባ 3. የተፋታ 4. በሞትየተለዩ	
3.	በአማካይየሚያገኙትወርሀዊገቢ?	1. 0 - 500 ብር 2. 600 – 1000 ብር 3. 1001—2000 ብር 4. 2001 – 3000 ብር 5. 3001 ብርበላይ	

8.	የ ሞ ሪ ያ አ ድራ ሻ ?	1.አ ዲ ስ አ በ ባ 2.ሌ ላ አ ካ ባ ቢ	(ይ ግ ለ ፁ……)
9.	የ ስ ኪ ር ህ ማ ማ እ ን ዳ ለ ቦ ት ካ ወ ቁ ም ን ያ ህ ል ጊ ዜ ሆ ኖ ት?	1. ከ 1 አ ጭ በ ታ ች 2. 1 አ ጭ 3. 2 አ ጭ 4. 3-5 አ ጭ 5. 6- 10 አ ጭ 6. ከ 11 አ ጭ በ ላ ይ	
10.	በ ቤ ተ ሰ ብ ዎ ል ላ ስ ኪ ር ያ ለ በ ት ቤ ተ ሰ ብ አ ባ ል አ ለ	1. አ ዎ አ ለ 2. የ ለ ም	

ተ.ቁ	ዝርዝር	ሜኔስ	አስተያየት
1.	አንዳነ ድጊዜ ለስኪር ህመሞን በየቀኑ በቋሚ ት እሚማ ቡትን አማገ ብቀድሞኩ ማቋድእረተው	1. አዎ 2. አላወቅም	

ክፍልሁለት: የአማገ ብክትትልመጫ ኛ

	ያውቃሉ ?		
2.	አንዳነ ድጊዜ ለስኪር ህመሞን በየቀኑ በቋሚ ት እሚመ ቡትን አመጋ ብትላነ ት እረስተዋል?	1. አዎ 2. አላውቅም	
3.	አንዳንዴ ከሚሳት ውጪበሆን ምክንያት ሰዎች አመጋ ባቸውን ይዘላሉ. ባለፈውሁለት ሳምንት እርሶ አመጋ ቦን በትክክል ከመመ ገየዘለሉበት ቀን አለ ?	1. አዎ 2. አላውቅም	
4.	አንዳነ ዴለስኪር ህመሞን በየቀኑ በቋሚ ት እሚመ ቡትን አመጋ ብእቅዶን ከእለት ተእለት ኑሮ ጋር ከማክዴድ እረስተውያውቃሉ ?	1. አዎ 2. አላውቅም	
5	አንዳንዴየስኪር ማከንዎ የተስተካከለ ሲማክልዎ በቋሚ ት እሚመ ቡትን አመጋ ብአቋርጡአውያውቃሉ ?	1. አዎ 2. አላውቅም	
6	አመጋ ቦን በየቀኑ ማከታተል የማስልቸት ስሜት ተሰምቶት ያውቃል ?	1. አዎ 2. አላውቅም	
7.	ከሚፈቀዱ ምግቦች የማከልከል ስሜት ተሰምቶት የውቃል ?	1. አዎ 2. አላውቅም	
8.	አትክልት እና ፈራፍሬ አመጋ ቦ ውስጥ ከማካተት እረስተውያውቃሉ ?	1. አዎ 2. አላውቅም	
9.	አትክልቶችን በየቀኑ አመጋ ቦ ውስጥ ማካተት እረስተውያውቃሉ ?	1. አዎ 2. አላውቅም	
10.	ቅባት እና ጭማነ ከአመጋ ቦ ማክወገ ድ አረስተው ያውቀሉ ?	1. አዎ 2. አላውቅም	

ክፍልሶስት፡ የአመጋገብየበሀሪመመዝኛ፡ ፡

የሚከተሉት ጥያቄዎች የስኪር ህመምተኞች ሚከበቅባቸውአመጋገብ ዙሪያ ያላቸውን በቋሚ ት የመማ ብ ፍላጎ ት፣ ከሚህበረሰቡ ሚደርስባቸውን ጫፍ፣ አመጋገባቸውን ለማ ታተል ያላቸውን ጥንካሬ ይመዝናሉ፡ ፡

በተሰጡት የመመዝኛ ደረጃ የእርሶን አመለካክት ከ 1-5 በተሰጡውደረጃ እንዲያሰቀምጡእንጢይቃለን፡ ፡

የነጥብአሰጣጥ ምሳሌ፡ የአካል ብቃት እንቅስቃሴ ሚድረግ ለጤፍ ይጠቅሜል

በጣምአልስማምም 1 2 3 4 5 በጣምእስማምላሁ

		የመመዝኛ ደረጃ						
	ከታች በተገለፀውሀሳብ መዘነ ውከ 1-5 ደረጃ ይስጡ		1	2	3	4	5	
1	ስኪር ታካሚዎቸእንዲከተሉት የሚከበቅባቸውአመጋገብ በየቀኑ ክተከታተልኩ በሽታውሚያስከትላቸው ተጨሜሪ ጉዳቶችን እነደተከላከልኩ ይሰኛል	በጣምአልስማምም	1	2	3	4	5	በጣምእስማምላሁ
2	ስኪር ታካሚዎቸእንዲከተሉት የሚከበቅባቸውአመጋገብ በየቀኑ ክተከታተልኩ የፈለግኩትን ከመበላት አና ከማጡጣት ይከለክለኛል	በጣምአልስማምም	1	2	3	4	5	በጣምእስማምላሁ
3	ስኪር ታካሚዎቸእንዲከተሉት የሚከበቅባቸውአመጋገብ በየቀኑ ክተከታተልኩ የስኪር ማጡኔ እንዲስተካከል ይረዳኛል	በጣምአልስማምም	1	2	3	4	5	በጣምእስማምላሁ
4	ስኪር	በጣምአልስማምም	1	2	3	4	5	

	ታካሚዎቹእንዲከተሉት የሚከበቅባቸውአመጋገብ በየቀኑ ክተከታተልኩ ከተከለክሉ ምግቦች የማ ኘውጥቅምሟርብኝ ይማክለኛል							በጣምእስማማሁ
5	የገቢማስ በቋሚ ት አመጋገብን ለማክታተል አስቸጋሪ ያደርጋል	ላይሆን ይችላል	1	2	3	4	5	ሊሆን ይችላል
6	በማህበራዊ ዝግጅቶች ላይ ይሉኝታ በቋሚ ት አመጋገብን ለማክታተል አስቸጋሪ ያደርጋል	ላይሆን ይችላል	1	2	3	4	5	ሊሆን ይችላል
7	በጉዞ ወቅት በቋሚ ት አመጋገብን ለማክታተል አስቸጋሪ ያደርጋል	ላይሆን ይችላል	1	2	3	4	5	ሊሆን ይችላል
8	ምግብለማዘገጃት ጊዜ ማጣት በsሚ ት አመጋገብን ለማክታተል አስቸጋሪ ያደርጋል	ላይሆን ይችላል	1	2	3	4	5	ሊሆን ይችላል

ተ.ቁ			-2	-1	0	1	2	
9.	ለእኔ ተጨማሪ ጉዳቶችን ልማክላከል ስኪር ታካሚዎቹእንዲከተሉት የሚከበቅባቸውአመጋገብበየቀኑ ማክታተሌ	በጣም አያስደስትም	-2	-1	0	1	2	በጣም ያስደስታል
10.	ለእኔ የተክለከሉ ምግቦችን አለመማ ብ	በጣም አያስደስትም	-2	-1	0	1	2	በጣም ያስደስታል
11.	ለእኔ ስኪር ማከኔ ንን ለመቆጣጠር አመጋገብበየቀኑ ማክታተሌ	በጣም አያስደስትም	-2	-1	0	1	2	በጣም ያስደስታል

12.	ለእኔ ከልሎች የ ተለየ አመ ጋ ገ ብ ማከ ተሌ	በ ጣም አ ያ ስ ደ ስ ት ም	-2	-1	0	1	2	በ ጣም ያ ስ ደ ስ ታ ል
13.	ቤተ ሰ ቦ ቼ ስ ኪ ር ታካ ሚዎ ቸ ውእ ን ዲ ከ ተ ሉ ት የ ሚከ በ ቅ ባ ቸ ውአ መ ጋ ገ ብ በ የ ቀ ኑ ማከ ታ ተ ሌ ን	አ ይ ደ ግ ፉ ም	1	2	3	4	5	ይ ደ ግ ፉ ሉ
14.	ጓ ደ ኞ ቼ ስ ኪ ር ታካ ሚዎ ቸ ውእ ን ዲ ከ ተ ሉ ት የ ሚከ በ ቅ ባ ቸ ውአ መ ጋ ገ ብ በ የ ቀ ኑ ማከ ታ ተ ል እ ን ዳ ል ብኝ ያ ሰ ባ ሉ	በ ጣም አ ል ስ ማ ማ ም	1	2	3	4	5	በ ጣም እ ስ ማ ማ ለ ሁ
15.	ሐ ኪ ሞ ች ስ ኪ ር ታካ ሚዎ ቸ ውእ ን ዲ ከ ተ ሉ ት የ ሚከ በ ቅ ባ ቸ ውአ መ ጋ ገ ብ በ የ ቀ ኑ ማከ ታ ተ ል እ ን ዳ ል ብኝ ያ ሰ ባ ሉ	አ ይ ደ ግ ፉ ም	1	2	3	4	5	ይ ደ ግ ፉ ሉ
16	ሌ ሎ ች ስ ኪ ር ታካ ሚዎ ቸ ውየ ሚከ በ ቅ ባ ቸ ው አ መ ጋ ገ ብ በ የ ቀ ኑ ማከ ታ ተ ሌ ን	አ ይ ደ ግ ፉ ም	1	2	3	4	5	ይ ደ ግ ፉ ሉ

		የ መ ጫ ዝ ኛ ደ ረ ጃ						
	ከ ታ ች በ ተ ገ ለ ፀ ው ሀ ሳ ብ ጫ ዝ ነ ው ከ 1-5 ደ ረ ጃ ይ ስ ጡ		1	2	3	4	5	
17	ለ እ ኔ ስ ኪ ር ከ ሚ ያ ስ ከ ት ላ ቸ ውተ ጨ ማ ሪ ጉ ዳ ዶ ች ለ ማ ላ ከ ል ታ ካ ሚዎ ቸ ውእ ን ዲ ከ ተ ሉ ት የ ሚከ በ ቅ ባ ቸ ው አ መ ጋ ገ ብ በ የ ቀ ኑ	ይ ጎ ዳ ል						ጠ ቃ ሚ ነ ው
		ጥሩ ነ ው	1	2	3	4	5	ሞ ጥ ሮ ነ ው
		ለ እ ኔ ያ ስ ደ ስ ተ ኛ ል	1	2	3	4	5	ለ እ ኔ አ ያ ስ ደ ተ ኝ ም
		ዋ ጋ ቢ ስ ነ ው						

	ማካ ታተል							ይጠቅማል
			-2	-1	0	+1	+2	
18	ለእኔ ቤተሰቦቼ አማገ ቤን ማካ ታተሌን ማደገ ፋቸውበጣም ጢቃሚነ ው	በፍፁም አይጠቅምም	-2	-1	0	+1	+2	በጣምይጠቅማል
19	ለእኔ ጓደኞቼ አማገ ቤን ማካ ታተሌን ማደገ ፋቸውበጣም ጢቃሚነ ው	በፍፁም አይጠቅምም	-2	-1	0	+1	+2	በጣምይጠቅማል
20	ለእኔ ሐኪሞቼ አማገ ቤን ማካ ታተሌን ማደገ ፋቸውበጣም ጢቃሚነ ው	በፍፁም አይጠቅምም	-2	-1	0	+1	+2	በጣምይጠቅማል
21	ለእኔ ልሎች ስኪር ታካ ማሞቸውማያ ደርጉ ትን ማድረግ በጣም ጢቃሚነ ው	በፍፁም አይጠቅምም	-2	-1	0	+1	+2	በጣምይጠቅማል

ተ.ቁ			-2	-1	0	1	2	
22.	ለኔ የገቢ ማ ስ ሲያጋጥመኝ በቋሚ ት አማገ ቤን ለማ ታተል ያለኝ ፍላጎ ት	ዝቅተኛ ይሆና ል	-2	-1	0	1	2	ከፍተኛ ይሆና ል

23.	ለኔ በሚበራዊ ዝግጅቶች ላይ ይሉኝታ ሲሰማኝ በቋሚ ት አመገ ቤን ለማታተል ያለኝ ፍላጎ ት	ዝቅተኛ ይሆና ል	-2	-1	0	1	2	ከፍተኛ ይሆና ል
24.	ለኔ በጉዞ ወቅት በቋሚ ት አመገ ቤን ለማታተል ያለኝ ፍላጎ ት	ዝቅተኛ ይሆና ል	-2	-1	0	1	2	ከፍተኛ ይሆና ል
25.	ለኔ ምግብ ለማዘ ገጃት ጊዜ በማጣበ ት ወቅት በቋሚ ት አመገ ቤን ለማታተል ያለኝ ፍላጎ ት	ዝቅተኛ ይሆና ል	-2	-1	0	1	2	ከፍተኛ ይሆና ል

	ከታች በተገ ለፀ ው ማዘነ ውከ 1-5 ደረ ጃ ይስ ጡ		1	2	3	4	5	
26	ለእኔ ቅር ብየ ምላ ቸውሰ ዎች ስ ኪር ስ ኪር ከ ሚያ ስከ ትላ ቸውተ ጨ ሚ ጉዳ ቶች ለ ማከ ላከ ል ታካ ሚዎች እ ንዲከ ተሉት የ ሚከ በ ቅባ ቸው አ መገ ብ በየ ቀኑ ማከ ታተል እ ንደ ሚያ ሰፈል ገኝ ያስ ባሉ	በ ጣም አ ልስ ማማም	1	2	3	4	5	በ ጣም አ ልስ ማማም
27	ስ ኪር ከ ሚያ ስከ ትላ ቸውተ ጨ ሚ ጉዳ ቶች ለ ማከ ላከ ል ታካ ሚዎች እ ንዲከ ተሉትየ ሚከ በ ቅባ ቸውአ መገ ብ በየ ቀኑ ማከ ታተል ይጠ በ ቅብኛ ል	በ ጣም አ ልስ ማማም	1	2	3	4	5	በ ጣምአ ስ ማማላ ሁ
28	ወደ ፊት ስ ኪር ከ ሚያ ስከ ትላ ቸውተ ጨ ሚ ጉዳ ቶች ለ ማከ ላከ ል ታካ ሚዎች እ ንዲከ ተሉትየ ሚከ በ ቅባ ቸውአ መገ ብ በየ ቀኑ ማከ ታተል ክእኔ ይጠ በ ቃል	በ ጣም አ ልስ ማማም	1	2	3	4	5	በ ጣምአ ስ ማማላ ሁ

	ስኳር ከሚያስከትላቸውተጨማሪ ጉዳቶች ለማላከል ታካሚዎች እንዲከተሉት የሚከበቅባቸውአማገብ በየቀኑ ማከታተል እንደምቸል እርግጠኛ ነኝ	በጣም አልስማማም	**1**	**2**	**3**	**4**	**5**	በጣም እስማማለሁ
30	ለእኔ ስኳር ከሚያስከትላቸውተጨሚ ጉዳቶች ለማላከል ታካሚዎች እንዲከተሉት የሚከበቅባቸውአማገብ በየቀኑ ማከታተል	ቀላል ነው	1	2	3	4	5	አስቸጋሪ ነው
31	ስኳር ከሚያስከትላቸውተጨሚ ጉዳቶች ለማላከል • ታካሚዎች እንዲከተሉት የሚከበቅባቸውአማገብ በየቀኑ የማከታተል ውሳኔ በራሴ ቁጥጥር ስር ነው	በጣም አልስማማም						በጣም እስማማለሁ
32	ስኳር ከሚያስከትላቸውተጨሚ ጉዳቶች ለማላከል ታካሚዎች እንዲከተሉት የሚከበቅባቸውአማገብ በየቀኑ ለማከታተል ማነኛውምሁኔታ ባጠቃላይ የራሴ ጉዳነው	በጣም አልስማማም	1	2	3	4	5	በጣም እስማማለሁ

33	ወደፊት ስኳር ከሚያስከትላቸውተጨማሪ ጉዳቶች ለማከላከል ታካሚዎች እንዲከተሉት የሚከበቅባቸውአማገብበየቀኑ ማከታተል እፈልጋለሁ	በጣምአልስማማም	1	2	3	4	5	በጣምእስማማለሁ
34	ስኳር ከሚያስከትላቸውተጨማሪጉዳቶችለማከላከል ታካሚዎች እንዲከተሉትየሚከበቅባቸውአማገብበየቀኑለመ ከታተልከማህበርሰቡጭፍእንደሚደረግብኝአስባለሁ	በጣምአልስማማም	1	2	3	4	5	በጣምእስማማለሁ
35	ወደፊት ስኳር ከሚያስከትላቸውተጨማሪጉዳቶችለማከላከል ታካሚዎች እንዲከተሉትየሚከበቅባቸውአማገብበየቀኑማከ ታተልሃሳብአለኝ	በጣምአልስማማም	1	2	3	4	5	በጣምእስማማለሁ
36	ለእኔቅርብየምላቸውሰዎች ስኳር ከሚያስከትላቸውተጨማሪጉዳቶችለማከላከል ታካሚዎች እንዲከተሉትየሚከበቅባቸውአማገብበየቀኑእን ድከታተልይፈልጋሉ	በጣምአልስማማም	1	2	3	4	5	በጣምእስማማለሁ

የቅድመ ጥናት ቃለ መጠይቅ

1. ለስኳር ህክምና እንዲማቡ የሚከበቅቦትን ጤፍማ አመጋገብ በsሚ ት ያለሜረጥ መከተል ጥቅሙምንድን ነውብለውያምናሉ ?ጉዳቱስ ?
2. ለስኳር ህክምና እንዲማቡ የሚከበቅቦትን ጤፍማ አመጋገብ በsሚ ት ያለሜረጥ መከተል ጋር በተያያዘ ያሎት የግል ልምድ ወይምአስተያየ ት ምንድን ነው?
3. ለስኳር ህከምን እንዲማቡ የሚከበቅቦት ጤፍማ አመጋገብ በsሚ ት ያለማቋsረጥ መከተሎን የሚደግፉ ስዎች ወይም ቡድኖች እነማን ናቸው? የሚይደግፉትስ እነማን ናቸው?
4. ለስኳር ህከምን እንዲማቡ የሚከበቅቦት ጤፍማ አመጋገብ በsሚ ት ያለሜረጥ መከተሎን ዙሪያ የልሎች ሰዎች አማላካከት ወይምአስተሳሰብ ጋር የሚያይዙት ጉዳይ ካለ ይነገሩን ?
5. ለስኳር ህከምን እንዲማቡ የሚከበቅቦት ጤፍማ አመጋገብ በsሚ ት ያለሜረጥ እንዳይከተሉ ወይምእንዳይችሉ የሚያደርጎ ት ጉዳዮች ምንድን ናቸው?
6. ለስኳር ህከምን እንዲማቡ የሚከበቅቦት ጤፍማ አመጋገብ በsሚ ት ያለሜረጥ መመገብን ሲያስቡ ወደጭቅላትዎ የሚመጣልዎት ሀሳብ ምንድን ነው ?
7. ለስኳር ህከምን እንዲማቡ የሚከበቅቦት ጤፍማ አመጋገብ በsሚ ት ያለሜረጥ ለመከተል ያሎት ፍላጎ ት እንዴት ነው ?