ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF ALLIED HEALTH SCIENCES

DEPARTMENT OF NURSING AND MIDWIFERY

ASSESSMENT OF ADHERENCE TO INSULIN SELF ADMINISTRATION AND ASSOCIATED FACTORS AMONG DIABETES MELLITUS PATIENTS AT ENDOCRINOLOGY UNIT OF TIKUR ANBESSA SPECIALIZED HOSPITAL

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A THESIS TO BE SUBMITTED TO SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF ALLIED HEALTH SCIENCES, DEPARTMENT OF NURSING AND MIDWIFERY FOR PARTIAL FULFILLMENT OF THE DEGREE OF MASTERS IN ADULT HEALTH NURSING

ADDIS ABABA, ETHIOPIA

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APPROVED BY THE BOARD OF EXAMINERS

This thesis by **Yusuf Gerada Haji** is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of Masters of Science in Adult Health Nursing.

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Addis Ababa, Ethiopia

June, 2014

ACKNOWLEDGEMENT

Firstly, I would like to thank the almighty ALLAH who gave me a good health, strength, courage, and commitment to complete this thesis.

Secondly, my deepest gratitude and special thanks goes to **s/r Zuriyash Mengistu (RN, BSC, MSC)** for her uninterrupted, wholehearted active support, advise, constructive suggestions and comments and unreserved guidance that helped me a lot to complete this research in conclusive manner.

Thirdly, I would like to express my heartfelt gratitude and thanks to Addis Ababa University Department of Nursing and Midwifery for provision of the chance to undertake this research on such an important topic, which is expected to contribute for scaling up adherence of diabetic patients to insulin self administration by identifying the magnitude and route cause to non-adherence. I would also like to thank the library and internet center staffs of Nursing and Midwifery department and those at main library of school of medicine for their unreserved support and who facilitated for me to get necessary literatures of similar studies.

Fourthly, my sincere gratitude goes to my wife Fetia Abdu for her invaluable help and encouragement.

Last but not least I would like also to thank individuals who put effect to the accomplishment of this research.

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ABBREVIATIONS

CI=Confidence Intervals

DM =Diabetes Mellitus

IDDM =Insulin Dependent Diabetes Mellitus

ISA=Insulin Self Administration

NGOs = Non-Governmental Organizations

NIDDM = Non-Insulin Dependent Diabetes Mellitus

COR=Crude odds ratio

AOR=Adjust odds ratio

SPSS = Statistical Package for Social Sciences

TASH=Tikur Anbasa Specialized Hospital

UKPDS = United Kingdom Prospective Diabetes Study

WHO = World Health Organization

ABSTRACT

Background: Diabetes is a significant and growing health problem worldwide. The goals of diabetes treatment are to keep blood glucose levels as near normal as possible while avoiding acute and chronic complications and diabetes mellitus requires continual intensive treatment in order to reduce the risk and progression of chronic micro- and macro-vascular complications. A key dimension of healthcare quality is adherence to prescribed medications. Non-adherence with insulin regimens is associated with worse glucose control and with higher rates of diabetes-related complications.

Objectives: To determine the pattern of adherence to insulin self administration and associated factors among adult patients with diabetes mellitus at endocrinology unit of Tikur Anbessa Specialized Hospital.

Methods: A cross-sectional study was conducted from December to June 2014, on a total of 378 diabetic patients on insulin self administration using convenience sampling method until the required sample size achieved. The data were collected using structured questionnaires after ethical approval and informed signed consent have been taken. The data entry and analysis was conducted using Epi info version 3.5.4 and SPSS version 21.

Results: One hundred twenty five (33.1%) of the respondents were found to be non-adherent to insulin self injection. Multivariate analysis identified who stopped taking insulin when they feel better, who have Heart disease and those not taking insulin when they were out of home for long time as independent factors for non adherence of insulin self administration.

Conclusion: One third of the respondents are found to be non-adherent to insulin injection. The most common reason for non adherence to insulin self administration were forgetting time of injection, deliberately, feeling better and feeling worse. Almost all participants have been using

one needle for two or more days, only 4 (1.1 %) participants have been using single needle once as recommended.

Recommendation: There is a need to design a means for patients to understand risk and complication of non adherence to insulin self administration, patients should be encouraged to discuss their injection related concerns and providing them leaflet to avoid poor recall of instructions and improve consequent clinical outcomes. For those patients who do reuse insulin needle, nurses should check frequently injection sites as reusing needle causes infection.

Key words: Adherence, Insulin self administration, diabetes mellitus

CHAPTER ONE: INTRODUCTION

1.1. Back ground information

Diabetes mellitus (DM) is defined as a group of metabolic diseases characterized by hyperglycemia (increased blood glucose) resulting from defects in insulin secretion, insulin action, or both [1]. Chronic hyperglycemia is associated with long-term damage, dysfunction and failure of various organs, especially the eyes, kidney, nerves, heart and blood vessels [2].

There are four major classifications of diabetes mellitus [3], namely: *type 1, type 2, gestational diabetes mellitus* and *other specific types of diabetes*. Type 1 and type 2 diabetes mellitus are the major and more common types of diabetes mellitus. Type 1 DM is characterized by beta-cell destruction often leading to absolute insulin deficiency caused by autoimmune destruction of the beta-cells of the pancreas which accounts for 5-10% of all diagnosed cases of diabetes [3, 4] while type 2 diabetes mellitus (type 2 DM) is characterized by a relative insulin deficiency resulting from a reduced sensitivity of tissues to insulin and impairment of insulin secretion from pancreatic B-cells [5].

The goals of diabetes treatment are to keep blood glucose levels as near normal as possible while avoiding acute and chronic complications [3] and diabetes mellitus (DM) requires continual intensive treatment in order to reduce the risk and progression of chronic micro- and macro-vascular The goals of diabetes treatment are to keep blood glucose levels as near normal as possible while avoiding complications [6]. On the other hand, the treatment of the condition is associated with a high risk of acute complications, particularly hypoglycemia [7]. The prevention and control of both types of complications are significantly influenced by adherence to treatment.

The multiple lifestyle modifications that are of utmost importance in the management of diabetes require a high degree of adherence from the patients as well [8].

Insulin therapy is indicated for all patients with type 1 diabetes mellitus and a substantial proportion of those with type 2 diabetes and advanced β-cell dysfunction; [9-11] as well the need for insulin depends on the balance between insulin secretion and insulin resistance [12]. Non-adherence with insulin regimens is associated with worse glucose control [9-11] and with higher rates of diabetes-related complications [9, 13].

A key dimension of healthcare quality is adherence to prescribed medications. However, medication non-adherence is particularly common among patients with diabetes mellitus, especially in case of insulin self administration and inadequate adherence compromises safety and treatment effectiveness, leading to increased mortality and morbidity with considerable direct and indirect costs to the healthcare system [14,15]. A recent WHO report states that, because the magnitude of non-adherence and the scope of its sequelae are so alarming, more health benefits worldwide would result from improving adherence to existing treatments than by developing new medical treatments [6].

Effective usage of insulin in the management of hyper glycaemia remains a challenge in developing countries. In most developing countries, the mainstay of insulin delivery is single or multiple daily subcutaneous injections and commonly used insulin delivery devices include insulin syringes and pens. Insulin therapy remains widely unacceptable amongst patients with DM and reasons for this scenario range from needle phobia, costs and inconvenience of daily injections [12].

The prevalence of adherence to insulin administration varies widely. For instance Rates of adherence to insulin therapy among patients withT2DM range from 63% to 77% [16, 17]. In a study conducted in Finland most of the respondents reported adhering to insulin injections as scheduled either daily (84%) or almost daily (15%) [8].

1.2. Statements of the problem

Diabetes is a significant and growing health problem worldwide. Diabetes mellitus is also an important problem in Africa. It is chronic disease that requires long term medical attention to limit the development of complications. Even though the compelling evidence about the effectiveness of medications exists, adherence to treatment has been recognized to be a major in patients with diabetes mellitus [17]. Low cost strategies such as lifestyle modifications, increasing physical activity and effective drug use have been shown to reduce the impact of diabetes and associated complications [18].

Medication adherence is a growing concern to clinicians, healthcare systems, and other stakeholders (e.g., payers) because of mounting evidence that non-adherence is prevalent and associated with adverse outcomes and higher costs of care [19]. Despite the benefits of insulin therapy, many people with diabetes don't adhere to treatment. Some avoid insulin therapy or refuse to start it. A recent study found more than a third of the roughly 25 million Americans with diabetes don't take insulin as prescribed and 20% intentionally skip some doses, which can lead to serious health risks [20]. A number of factors affecting adherence to treatment in different clinical situations have been identified [21].

It has been shown in clinical practice that patients have difficulty in taking the prescribed medications, following a diet and changing their lifestyle as directed by a multidisciplinary team. It is estimated that only a third of patients have adequate treatment adherence [22]. Several studies investigating adherence to chronic disease treatment have evidenced that patients often discontinue their medications or even do not take them at all because they consider them

ineffective or experience untoward side effects [23-25]. Among diabetes patients, many believe they do not need any drug therapies as they have no symptoms [22].

The available studies are related mainly to children and adolescents [26-29]. There is Studies suggesting certain positive correlates of higher adherence, especially psychological [24,25]. Support from health care providers and relatives as well as overall motivation, willpower, and threat to the physical wellbeing of the patient were predictors of good adherence [28,29]. These results, however, cannot be generalized to adult patients [30]. With reference to diabetes management, the term adherence is now often specified by the expressions self-care or self-management adherence to correspond better with the comprehensive nature of the tasks to be mastered by the patient on an everyday basis in order to control the disease and to reach therapeutic goals [31, 32].

Many factors can affect treatment adherence and there is no consensus on which has the greatest impact. First, it should be considered whether patients have access to drugs. Ruling out the possibility of no access, patient adherence to drug therapy can be divided into four groups of factors: patient-related; related to patient-provider relationship, therapeutic regimen, and the disease itself [22].

Interventions aimed at improving adherence would provide a significant positive return on investment through primary prevention of risk factors and secondary prevention of adverse health outcomes [3].

Achieving good hyper glycemic control is of paramount importance in the reduction of diabetes mellitus (DM) associated morbidity and mortality. Insulin adherence plays a key role in the

management of DM but unfortunately whilst some healthcare providers present insulin as a treatment of last resort , patients on insulin often have insulin related issues such as needle phobias, fear of hypoglycaemia, weight gain and in developing countries, costs [8].

To improve patient adherence, it is important to understand the extent of patient adherence and why non-adherence to insulin self administration occurs. A substantial literature has documented a number of factors related to diabetes regimen adherence problems [33].It is helpful to consider demographic, psychological, and social factors, as well as health care provider, medical system, and disease- and treatment-related factors [33].

There is a lack of studies investigating adherence to insulin self administration, and those available have different designs and inconsistent results. Further investigation is needed as most studies have focused on patient adherence to antihypertensive, oral antidiabetic agents and lipid-reducing drugs instead of insulin self-administration.

1.3. Significance of the study

This research is expected to provide basic information for diabetes educators and other health care practitioners those aimed at improving insulin self administration in diabetic patients and to overcome obstacles to effective administration of insulin self- injection therapy. It may also be used as a base line body of knowledge for other researchers who will conduct a study on related topics and also for organizations working with diabetes patient. The result obtained from this study may give important information to future investigation of adherence to insulin self-administration and other supportive staff who contact with diabetes patient.

To sum up, the overall aim of this study is to analyze adherence to insulin self-administration and to identify factors affecting patients' adherence with insulin self administration at outpatient setting. The results of investigations could aid policy makers, healthcare providers, and patients and their families in the encouraging adherence to insulin self administration properly. Those with potentially lower adherence might be provided with additional support specifically tailored to individual needs, the effect of which could improve treatment outcomes.

CHAPTER TWO: LITERATURE REVIEW

2.1 LITERATURE REVIEW

According to the World Health Organization (WHO), adherence is defined as the extent to which a person's behavior (taking medication, following a diet, and/or executing lifestyle changes) corresponds with agreed recommendations from the health care provider [3]. Adherence to the treatment of chronic diseases is customarily poor and as such negatively influences both effectiveness in routine clinical practice as well as the efficacy outcomes of various therapeutic methods in clinical trials[34-38]. The correlations between adherence and clinical outcomes of patients with both types of diabetes were analyzed in one review article [39] which, like another study, has shown the positive effect of adherence on metabolic control in adults with type1 diabetes. The lack of medication adherence is seen as the cause of treatment failures, serious adverse reactions, even deaths [16].

Poor adherence to the treatment for diabetes results in avoidable suffering for the patients, development of complications of diabetes and their associated individual, societal, health system and economic costs. The picture in developing countries, where many fewer patients have their diabetes well-controlled, is cause for even greater concern. Patients with diabetes usually have co-morbidities that make their treatment regimens even more complex [3].

Poor adherence to treatment of chronic disease is worldwide problem of striking magnitude. Recently, the world health organization stated that only 50% of patient diagnosed with chronic illness were fully compliant with their treatment regimen, in developing country the rate are even lower. It is undeniable that many patient experiences difficulty in following treatment recommendations [40].

According to two recent surveys inUnited States of *American In April 2011,* at least one third of patients fail to take their insulin as prescribed, [14] and 20% of adults intentionally skip their doses [15]. Furthermore, despite the essential role of insulin therapy in the management of type 1 diabetes, compromised adherence is also common among younger patients with this disease, with many failing to follow their treatment plans [41].

From French Population-Based Study, thirty nine percent of patients had good adherence, 49% medium adherence and 12% poor adherence: 18% of patients reported sometimes forgetting to take their medicine, 9% running out of their medicine, 38% sometimes taking their medicine late, 4% sometimes deciding not to take their medicine because someday they felt that their treatment do more harm than good, 34% having too many pills to take and 5% sometimes stopping to take their medicine when they felt better [42].

From a study in India, of the 55 patients who self-identified as taking insulin by injection to treat either type 1 or type 2diabetes, 57% of the respondents reported omitting insulin injections, with 20% omitting insulin injections regularly. Regression analysis identified older age, lower income and education, type 2 diabetes, poor diet adherence, more frequently prescribed injections, interference with daily activities, pain, and embarrassment as independent factors for intentional insulin omission [43].

According to finding from a research in Nigeria, insulin adherence was noted in 123-77% of the Study subjects and this was comparable between persons with type 1 DM and those with type 2 DM [12].

From another study conducted on Insulin omission in women with IDDM, of the 341 IDDM subjects, 30.5% reported omitting insulin. Although rates of omission Seemed to peak during late

adolescence and early adulthood (i.e. between 15 and 30years of age, 40.2% reported omitting insulin), they remained markedly elevated through adulthood (30.3% in ages 31-45, 19.7% in ages 46-60 year). Subjects reported that omitting insulin is generally occurred on an infrequent basis. Of 104 only eight subjects reported that they "always" omitted insulin, and six subjects indicated "usually" omitting it. Sixteen subjects reported "often" omitting, 35 subjects "sometimes," and 39 subjects "rarely." In total, only 8.8% of the total subject sample reported frequent omission (indicating "always,""usually," or "often"). Frequent omission was most apparent during late adolescence and early adulthood (i.e. between 15 and 30 years of age, 15.9% reported frequent omission), with fewer cases in later adulthood (4.2% in ages 31-45 year, 6.1% in ages 46-60 year) [44].

The study conducted in southeastern Brazil revealed that 46 (100%) of subjects studied, 78.3%were adherent and 21.7% were non-adherent to Insulin self administration. 45.8% of respondents said they were very worried about needles and were bothered by them when they started insulin treatment [62].

However, the status of patient adherence to anti diabetic therapy and self management practice was not yet been known in Ethiopia. Especially that for insulin self administration is lacking.

Among those who had missed their medication the most common reasons for missing medications were forget fullness 107 (50.2%), being busy 34 (16%), others including side effects of drugs, disappearance of the symptoms and perceived inefficacy of the prescribed antidiabetic drugs and others 72 (33.8%)[58].

There were 197(65 %) responders who were visiting their health care providers every month. The subjects who were being followed by health care provider one every 3month were 67 (22.1%) and once every six months were 29 (12.9 %) respectively. Majority of the responders in the study

were using insulin syringe. Insulin syringes used by 203(68.1%) as compared to insulin pen which is used by 79(26.5%) of subjects. A few subjects a few subjects (5%) use separate needle and syringe for insulin injection. Dosing schedule of insulin there were 215(71.9%) of responders who were on twice a day insulin dosage. 70 (23.4%) reported once a day insulin only and 14(4.7%) were on more than2 times a day insulin. Two third of the responders said that they reuse insulin needle more than once. Only 75(24.9%) of responders are using needle only once. Majority of the respondent (71%) were disposing upto7 needles per week [60].

By investigating injection sites it was found that 65% of patients had skin complications in the form of lipohypertrophy was (29%). Regarding injection site abdomen, 55 (95 %,) thigh, 16 (44%) of the participants had used as injection site [61].

The study conducted in Ethiopia in TASH shows that mean duration of participant who have been living with diabetes were 12.3+ 7.6years [(95% CI) (4.7–19.9)] with minimum of 6 months and maximum of 41 years [56].

FACTORS INFLUENCING INSULIN SELF ADMINISTRATION

Adherence to long-term therapy for chronic illnesses in developed countries averages 50%. In developing countries, the rates are even lower. It is undeniable that many patients experience difficulty in following treatment recommendations [3]. Many patients find insulin therapy complicated, inconvenient, and painful. Some skip insulin doses or stop taking insulin altogether because of a mental barrier, such as fear of needles ("needle phobia") [3, 20]. Adherence is a primary determinant of the effectiveness of treatment [45,46] because poor adherence attenuates optimum clinical benefit [3]. Good adherence improves the effectiveness of interventions aimed at promoting healthy lifestyles.

Patient adherence to treatment recommendations has been shown to be related to many factors: disease related factors, patient socioeconomic status (SES), and other patient demographic variables, such as race, gender, health insurance status and social support [47].

A review of 50 years of research showed, lower adherence rates in these populations can be a result of attitudes concerning health and illness, medication practices, beliefs in Western or non-Western treatments and other cultural and religious beliefs. Reasons for non-adherence can vary greatly. For some, non adherence to medical treatment is sometimes seen as a rational choice patients make in an attempt to maintain personal identity, achieve health goals, and preserve health-related quality of life [48].

Research on adherence has typically focused on the barriers patients face in taking their medications. Common barriers to adherence are under the patient's control, such as forgetting to take the medication, distraction by other priorities, making the decision to purposefully omit

doses, not seeking information to make the best decision, and emotional factors that permit taking medication (i.e., depression), so that attention to them is a necessary and important step in improving adherence [49].

A study on Type 1 Diabetes among adolescents to investigate factors associated with reduced self-care showed social anxiety and fear of hypoglycemia was found to be negatively correlated with insulin and dietary adherence among boys than girls [50].

A research done in Nigeria on patient's anti-diabetic medication adherence levels, identified the causes of non-adherence as prescribed were nature of work/busy schedule of work, when felt worse (side effects of medications), when felt better, and forgetfulness [51]. The same research revealed that there was association between (age, gender, marital status, help and support from a spouse) while no significant association between (occupation, educational levels, monthly income, tribe, and state of origin) and adherence levels [51].

Linda et al found the following results on the cause of non-adherence drug therapy problems that the patients do not understand the directions (27%), cannot afford the drug product (26%), prefer not to take (19%), forget to take (14%), drug product is not available (11%), and patient cannot administer drug (3%) [52].

As to barriers to insulin initiation, many studies have demonstrated hesitance by patients to accept insulin treatment. In the United Kingdom prospective diabetes Study, 27% of patients initially declined insulin and a survey of 708 patients of insulin-naïve found that 28% said they would be unwilling to take insulin if it was prescribed. There are several myths, misperceptions, and negative attitude that act as barriers about the use of insulin among people with type 2

diabetes as follows: Insulin causes (blindness, renal failure, amputations, heart attacks, strokes, or early death), sense of personal failure, low self-confidence, low confidence in therapy, injection phobia, hypoglycemia concerns, feeling that diabetes is a serious cause of concern, negative impact on social life and job, Inadequate health literacy, health care provider inadequately explaining risks/benefits, and limited insulin self-management training [53].

A qualitative study conducted to determine factors influencing insulin acceptance among type 2 diabetes mellitus patients in a primary care clinic showed many participants had negative concerns related to insulin use. The main concerns vented by them were painful injection, apprehension about self-injection, needle phobia, social embarrassment, inconvenience and impractical, lifestyle restriction, and social stigma were suggested by participants [54].

A research made in America, showed that Pen 30%, Syringe 70% of participants used insulin injection device and Change needle each use 56%. Intentional omission of insulin injections that should be taken occurs in the majority of adults using insulin to treat their diabetes and is common in 20% of participants [59].

2.2 Conceptual framework

This study had used a conceptual framework adapted from Anderson Model. The details of the framework displayed in figure 1 below. The arrows in the diagram show interactions between the variables. As depicted in the diagram adherence to insulin self-administration is affected by environmental, socio demographic factor, enabling factor, need factor and health behavior.

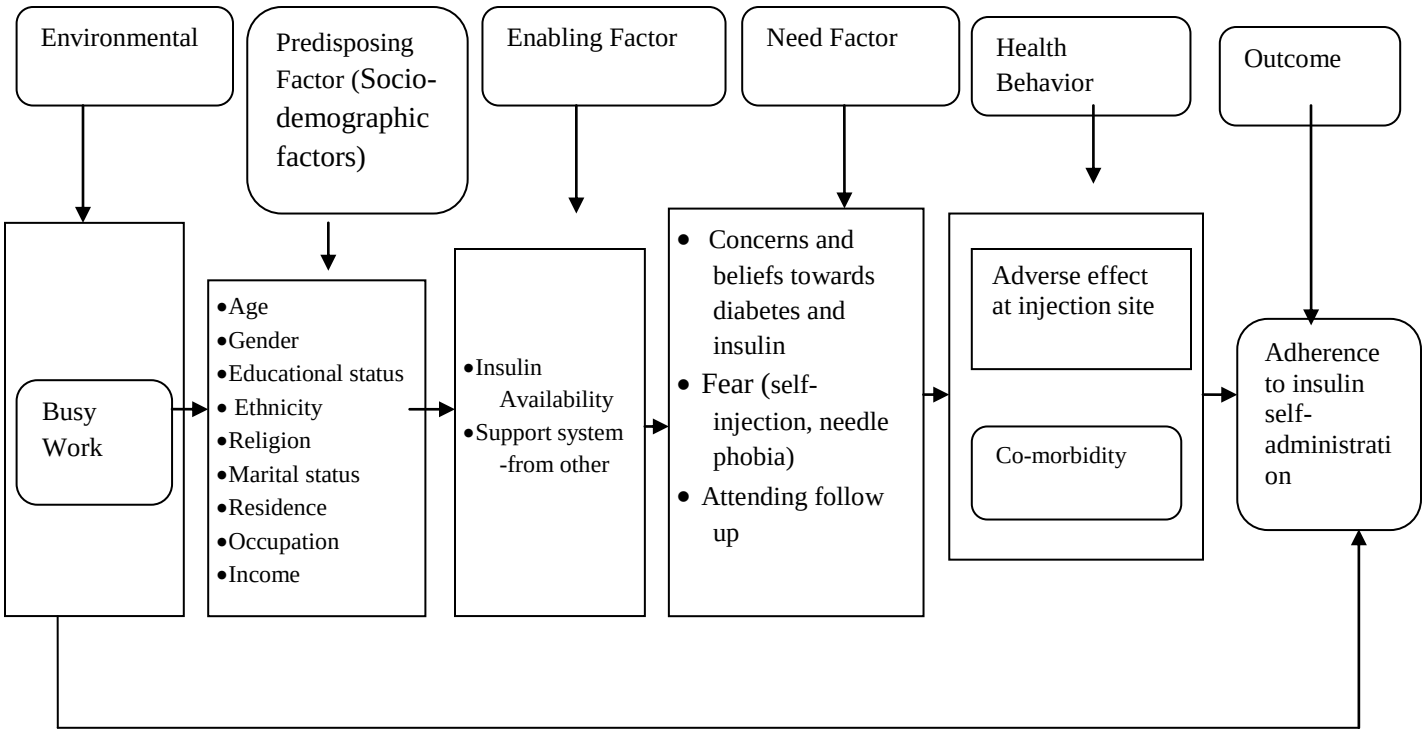

Figure 1: Conceptual framework showing adherence to insulin self administration and associated factors was adapted. [33]

CHAPTER THREE: OBJECTIVES

3.1. General Objective

To assess the pattern of adherence to insulin self administration and associated factors among adult patients with diabetes mellitus at endocrinology unit of Tikur Anbessa Specialized Hospital Addis Ababa Ethiopia

3.2. Specific Objectives

1. To assess the magnitude of insulin self administration adherence among patients with diabetes mellitus

2. To assess the pattern of adherence to insulin self administration

3. To identify the reasons for non-adherence to insulin self administration among patients with diabetes mellitus

CHAPTER FOUR: METHODS AND MATERIALS

4.1. Study Area and Period

The study was conducted from December to June,2014 at Endocrinology unit of Tikur Anbessa Specialized Hospital which is found in Addis Ababa City, Lideta Sub City. It is the main tertiary referral federally owned teaching and research Hospital in the country, which has been established in 1973 by the title "Prince Mekonnen" Memorial Hospital and it was named Tikur Anbessa Hospital in 1975 by the name of the Ethiopian soldier who were fighting the Italian. Endocrinology unit is one of the specialty units of the hospital, which was inaugurated by Professor Giuseppe "pino" Grimaldi president of the international association of lions club on Saturday 12th November 1994 [55]. The center provides services for a total of 5638 patients with diabetes in 2006 E.C as new and follow-up cases.

Accordingly, the study area was selected to find sufficient number of population for data collection who supposed to come from all corners of the country.

4.2. Study Design

The descriptive cross-sectional study design was employed regarding insulin self administration among diabetic outpatients who were attending the Endocrinology unit of Tikur Anbessa Specialized hospital.

4.3. Source and Study Population

4.3.1. Source Population

The source populations were all male and female diabetes patients diagnosed as type 1 and type 2 diabetes mellitus, who visited the endocrinology unit of the hospital during the study period.

4.3.2. Study Population

The study population all sampled male and female adults with type 1 and type 2 diabetes mellitus patients taking insulin self administration who visited the hospital's endocrinology unit at the time of data collection period.

4.3.2.1. Inclusion Criteria

The main inclusion criteria was: having diabetes either type 1 or type 2, non-pregnant, aged at least 18 years regardless of gender or ethnicity, attending the diabetic clinic during the study period, taking insulin self-administration and giving written informed consent to participate in the study.

4.3.2.2 Exclusion Criteria

Subjects were excluded from the study if they were unable to give consent (<18 years), mentally ill, senility, hearing impairment, vision impairment (cannot inject self), were taking anti-diabetic therapy other than insulin self administration, pregnant with diabetes or diagnosed with gestation diabetes due to different criteria on standard of control, newly diagnosed at the time of data collection and unwilling to participate.

4.4. Sample Size Determination

The required sample size of eligible participants for the study was determined by using single population proportion formula. The sample size was calculated based on the following assumption.

Where n = sample required

P = prevalence of insulin self administration 50 %

d = the marginal error 5%, and a confidence interval (CI) ware taken to be 95%

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2} = \frac{(1.96)^2 0.5(1-0.5)}{(0.05)^2} = \mathbf{384}$$

Since the source population consisted of less than 10, 000 respondents, the sample size were adjusted with correction formula:

$$n_f = \frac{n_i}{(1+n_i/N)}$$

Where, nf = the final sample size,

ni = initial sample size 384 and

N = total diabetic patients attending Black lion hospital 2006 E.C. (5638).

$$n_f = \frac{n_i}{(1+n_i/N)} = \frac{384}{(1+384/5638)} = \frac{384}{1.068} = \mathbf{360}$$

Considering 5% non-response rate, 378 diabetic patients are planned to be included in the study.

4.5. Sampling Procedures

Convenient sampling technique was to choose the respondents. As a result, all volunteer respondents which fulfill the inclusion criteria during data collection time were the sample population of the study until intended sample size was fulfilled.

4.6. Data Collection Tools and Techniques

Data was collected using standardized structured questionnaire by interviewing participants to obtain information on patients' demographic characteristics, rate of adherence to insulin self administration and some associated factors to adherence to insulin self administration. These include: health education attendance, frequent change to site of injection, patients' self rating of

how well they understood their drug regimens, adverse drug reactions, patients' affordability of the prescribed drugs, duration of diabetes.

The data was collected by five staff degree Nurses who have experience of data collection repeatedly at Endocrinology unit of TASH and also trained on data collection. Continuous follow up and supervision was made by the principal investigator and one supervisor throughout the data collection period. Data collection was accomplished within one month duration (April 1st to May 1st, 2014).

Non-adherence was assessed using patients self reports of how they had been taking their medication in the week preceding the interview. Patients were asked to recall if they missed any doses of medication on a day by day basis over a period of one month. The number of injection missed was calculated basing on the prescribed dose. Patients who reported taking less than 80% of their prescribed insulin injection was considered not to be adhering to treatment.

4.7. Study Variables

4.7.1. Dependent Variable

Adherence to insulin self administration

4.7.2. Independent Variables

Socio demographic characteristics such as: (Age, Sex, Religion, Ethnicity, Education level, Income, Marital status)

Support system: quality of interaction and relationship with health providers, good social support (well-informed families), Practical and emotional support from health care providers

Attitude/Psychological factors: mental barrier, such as fear of needles, Belief in insulin benefits and effectiveness, fear of loss of control, fear of uncertainty, how other members of the family feel about them, fear of sexual dysfunction, negative concerns related to (self-injection, needle

phobia, injection pain), negative concerns (inconvenience, embarrassment, lifestyle restriction, negative social stigma, and poor self-efficacy), negative beliefs like ('insulin could cause organ damage', 'their diabetes was not serious enough', 'insulin is for life-long', and 'insulin is for more severe disease only').

Insulin Availability- If it is provided for free or found on the counter.

4.8. Operational Definitions

Diabetic patients: In this study diabetic patient refers to insulin self administering patients who have been diagnosed diabetes and who have had follow up at Eccrinology unit of TASH.

Insulin: refers to the medication i.e. exogenous hormone used to manage patients with diabetes.

Insulin adherence was defined as "taking medication as prescribed and/or agreed between the patients and the health care provider over a period of one month".

Non-adherence: Omitting insulin medication without the order of prescribed schedule.

Self administration of insulin injection: refers to the putting insulin liquid into body by puncturing the skin with syringe and needle.

4.9. Data Quality Control

Before starting the process of data collection, tools were adopted from previous studies and training was offered to data collectors on purpose and technique of data collection. The process of data collection was followed and checked by supervisor and principal investigator. Clarity and completeness of the filled questionnaire was checked immediately in the field by supervisor and principal investigator. Ethical clearance was obtained from Addis Ababa University College of health science Department of Nursing and Midwifery institutional research review board. Confidentiality of each client was assured; the questionnaire was anonymous and informed written consent was contained.

4.10. Data processing and analysis

Each completed questionnaire was coded. Data entry was performed by principal investigator using Epi-info version 3.5.4. After that, the entered data was exported to Statistical Package for Social Sciences (SPSS) version 21.0, then cleared and analyzed. Descriptive statistics was applied as necessary using frequency, percentage distribution, mean, median, range and standard deviation. Appropriate statistical techniques for data analysis was applied to determine association (OR and/or chi-square). Statistical significance was evaluated at 95% level of significance and the result was presented in the form of tables and pie chart.

4.11. Dissemination and Use of Results

The finding of the research will be submitted to Addis Ababa University, school of post graduate studies and to Endocrinology unit of Tikur Anbessa Hospital. If the findings are of a type that need due attention, the result will be further discussed with Tikur Anbessa Hospital administrative bodies. The finding will be also use for policy makers on how to design new strategy to strengthen the adherence in diabetic patients taking insulin self administration. Finally the research will be sent to publishing agents for public utilization of the finding.

4.12. Ethical Consideration

Ethical approval was obtained from the Standing Committee for Ethical Research institution review board at Addis Ababa University College of health science school of allied health science department of nursing and midwifery. In addition, permission was obtained from endocrinology unit of Tikur Anbessa Hospital, where diabetic patients on insulin self administration was participating in the study. All respondents were informed about their free choice to participate and to withdraw whenever they wished during data collection period. The

questionnaire was anonymous and written consent obtained from all respondents before the interview. Data collectors were secured permission latter from Endocrinology unit. In order to ensure the patient's privacy and confidentiality, the data collection was conducted only in the presence of the interviewer and the interviewee.

CHAPTER FIVE: RESULT

5.1 Socio demographics characteristics

A total of 378 insulin self administration diabetes mellitus outpatient respondents were participated in this study making a response rate of 100%. Regarding age distribution of the study participants, the majority of respondents in this study were found to be at the age category of between 31and 55 which accounts 195(51.6%), above 55years 74 (19.6%), the minimum and the maximum age of respondents were 19 and 78 years old respectively. The mean ages of respondents were 42.08 $\pm$ 13.71 years old. This study sample consists of 193(51.1%) males and 185(48.9%) were female. Regarding residence, most 343((90.7%) of the respondents were Urban followed by rural which accounts 35(9.3%). The dominant ethnicities of participants were Amhara 147(38%), followed by Oromo and Guraghe which accounts 97(25.7%) and 59 (15.6%) respectively. The result on marital status distribution show that married 261(69.0%), single 75(19.8%), widowed 20(5.3%) and others (divorced, and cohabitation) 22(5.8%). The most dominant religion of respondents was Orthodox 261(69.0%), followed by Muslim 75(19.8%), the rest 34 (9.O %), 8(2.1%), 6(1.6%) were Protestant, Catholic and Other religion followers, respectively. The finding concerning educational status distribution points that the greater part 136(36.0%) Secondary education (9-12) and 108 (28.6%) were at Primary education (1-8) while the rest 102(27.0%) were found to be at Tertiary education (Diploma and above) and 32(8.5%) were No formal education. Out of the total of 378 respondents 135(35.7%), 126(33.3%) and 110 (29.1), had monthly income of 500-1000, >1000, and <500 ETB respectively, were as the remaining 7(1.9%) had no income per month. (See table:1)

Table 1: Socio-demographic distribution of insulin self administration diabetes patients in Endocrinology unit of TASH 2014 (n=378)

Variables (n=378)		Frequency	Percent
Age	≤30	109	28.8
	31-55	195	51.6
	56-80	74	19.6
Sex	Male	193	51.1
	Female	185	48.9
Residence	Urban	343	90.7
	Rural	35	9.3
Ethnicity	Amhara	147	38.9
	Oromo	97	25.7
	Guraghe	59	15.6
	Tigre	40	10.6
	Silte	16	4.2
	Others	19	5.0
Marital status	Married	261	69.0
	Single	75	19.8
	Widowed	20	5.3
	Others (divorced, cohabitation)	22	5.8
Religion	Orthodox	248	65.6
	Muslim	82	21.7
	Protestant	34	9.0
	Catholic	8	2.1
	Others(pagan,Johba andWakefata)	6	1.6
Level of education			
	No formal education	32	8.5
	Primary education (1-8)	108	28.6
	Secondary education (9-12)	136	36.0
	Tertiary education (Diploma and above)	102	27.0
Current occupation			
	Business/Self employed	124	32.8
	Government employee	86	22.8
	Housewife	68	18
	NGO/Private sector employee	29	7.7
	Student	22	5.8
	Farmer	19	5.0
	Others*	30	7.9
Monthly income	<500	110	29.1
	500-1000	135	35.7
	>1000	126	33.3
	No income	7	1.9

*****Daily workers, retired

5.2 **Diabetes History**

About one half 186 (49.3%) of participants' duration of living with diabetic were greater than 10 year (above median), the median duration were 10 year which accounts 56 (14.8%) and the remaining 136 (36%) of clients were below median (<10years). In other word mean duration of diabetes was 12.61±7.48 years with CI of 95% (5.13–20.9) with minimum of one year and maximum of 40 years. The majority173 (45.8%) of participants were started insulin self administration therapy 5-10 years (Q_1-Q_3) before, which accounts 173 (45.8%), while 98 (25.9%) were above Q_3 (≥11 years) and 107 (28.3%) were below Q1 (1-4 years). Almost all 366 (96.8%) clients used insulin syringe for self injection of insulin, while only 8 (2.1%) and 4 (1.1%) of participant used insulin pen and needle with separate syringe respectively. Almost all 368 (97.4%), of participants' dosing schedule of insulin was twice a day while, 7 (1.9%) and 3 (0.8%) once a day and more than 2 times per day. About 195 (51.6%) Participants have been using one needle for 2-6 days, followed by173 (45.8%) of participant have been using single needle for 7 or more days while only 4 (1.1%) of participants have been using single needle once as recommended, the remaining 6 (1.6%) have been using single needle for one day. More than one half 261 (69.0%) of participants were visited to health care provider Once in 6 month, some 100 (26.5%) participants once in 3 month and only 17 (4.5%) visits health care provider once in a month. 257 (68.0%) of participants provided insulin freely from the TASH endocrinology unit, remaining 121 (32.0%) participants purchase insulin and syringe by their own expense. Almost all 374 (98.9%) of participant were rated the cost of their insulin as costly. All most all of 371 (98.1%) have regular follow up. Regarding Chronic condition(s) they have, hypertension, heart diseases, high cholesterol, lung disease which accounts 164 (43.4%), 60(15.9%), 58(15.3%), 58(15.3%) and 31(8.2%) respectively. (See table:2 below)

Table 2: Distribution of diabetes patient by duration with diabetic and insulin self administration in TASH 2014 (n=378)

Variable	n=378	Frequency	Percent (%)
Duration with Diabetic	<10 (Below median)	136	36
	10 (Median duration)	56	14.8
	>10 (Above median)	186	49.3
Duration of insulin therapy (self administration)	1-4 years (Below Q_1)	107	28.3
	5-10 years (Q_1-Q_3)	173	45.8
	≥11 years (Above Q_3)	98	25.9
Type of insulin device do you use	Insulin syringe	366	96.8
	Insulin pen	8	2.1
	Needle with separate syringe	4	1.1
Dosing schedule of insulin	Once a day	7	1.9
	twice a day	368	97.4
	more than 2 times per day	3	0.8
Time of using a needle	Once	4	1.1
	One day	6	1.6
	2-6 days	195	51.6
	7 or more days	173	45.8
Have regular follow up	Yes	371	98.1
	No	7	1.9
Visit to health care provider	Once in a month	17	4.5
	Once in 3 month	100	26.5
	Once in 6 month	261	69.0
Where you bring your insulin	Free	257	68.0
	Purchase	121	32.0
How you rate the cost of your insulin	Costly	374	98.9
	Cheap	4	1.1

		Yes	No	
Chronic condition(s) you have	Hypertension	164(43.4%)	214(56.6)	
	Heart diseases	60(15.9%)	318(%84.1)	
	High cholesterol	58(15.3%)	320(84.7%)	
	Lung disease	8(2.1%)	370(97.9)	
	Others diseases	31(8.2%)	347(91.8%)	

5.3 Practice of participants regarding taking their medicine

Almost all (99.2%) of the respondents have been informed by physicians as they are suffering with DM (not shown in table). One in three (33.07 %) of the respondents are found to be non-adherent to insulin injection while the remaining 253(66.9%) are almost adherent.

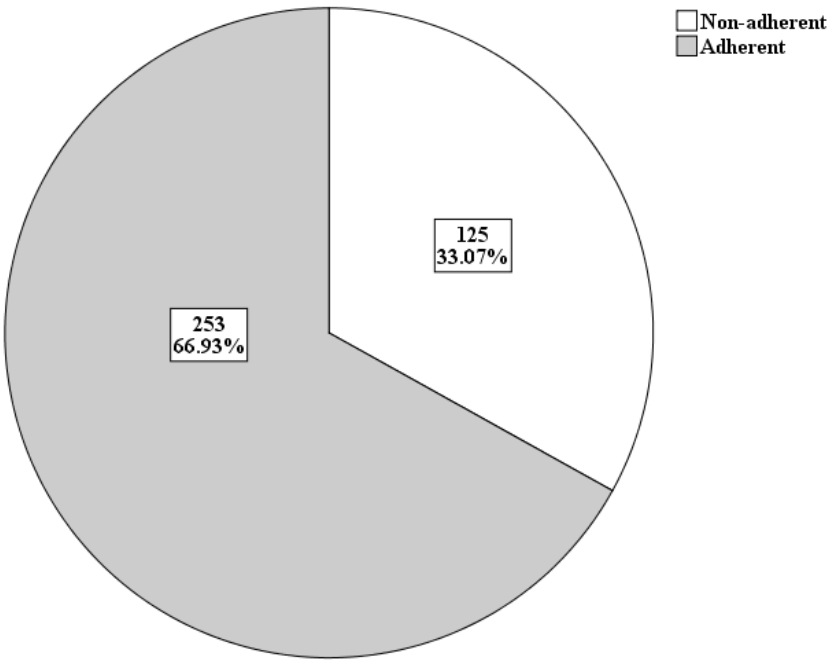

Figure 2: Distribution of diabetes patients by adherence and non adherence to insulin self administration in TASH in endocrinology 2014. (n=378)

About one in every 10 participants took his/her insulin injections at about the same time daily as recommended while 347 (91.8%) did not take insulin on similar time daily. Almost all participants 368 (97.4%) were reported that insulin should be administered before food at the morning and 58 (15.3%) were reported insulin should be administered after food and few 9 (2.4%) reported insulin should be administered before sleep. Only some 31 (8.2%) of participants did ever missed doses of their insulin on purpose, among these due to they cannot afford to buy

the insulin medications always 4 (1.1%), the nature of their work/schedule of work makes it impossible 15 (4.0%), they don't like taking/administering insulin medications 6 (1.6%), they cannot take or administer medication 3 (0.8%) and taking too many medicines 2 (0.5%), other (holy water follow up) 1(0.3%). 26 (6.9%) of participants stopped taking their medication when they were feeling better, 12 (3.2%) when they were feeling worse. 117 (30.9%) of participant didn't take their medication due forgetting. Among 378, 243 (64.3%), 8 (2.1%), and 8 (2.1%), respondents signs were encountered lipohypertrophy, open wound and infection signs at insulin injection site respectively. Respondents were using abdomen 266 (69.6%), upper arm 276(73.0%) and upper thigh 325 (86.0%) as injection site. Respondents store/keep their insulin in refrigerator, cold place and in sand accounting 246 (65.1%), 115 (30.4%) and 17 (4.5%) respectively. About three fourth 286 (75.7%) of participant took their insulin when they were out of home for long time. Only 112(29.6%) of respondents discarded Insulin after one month opening.

Table 3: Distribution of diabetes patient's perception about insulin self administration at the time when they agreed on insulin treatment in TASH 2014 (n=378)

		Frequency	Percent	Cumulative %
Valid	Needle phobia	104	27.5	27.5
	Anxiety / Stress	143	37.8	65.3
	Feel nothing	131	34.7	100
	Total	378	100	

Table 4: The crude odd ratio (COR) that predict adherence to insulin self administration of diabetes patients in Endocrinology unit of TASH 2014 (n=378)

	Sig.	COR	95% C.I. for COR	
			Lower	Upper
Farmer	0.030	0.188	0.041	0.850
Business/Self employed	0.013	0.202	0.057	0.710
Student	0.008	0.136	0.031	0.592
Heart diseases	0.003	2.347	1.341	4.110
Who stopped taking insulin when they feel better	0.023	0.395	0.177	0.881
Insulin is expensive	0.031	11.40	1.256	103.510
Adverse reaction at insulin injection site	0.006	0.536	0.344	0.836
Taking insulin when they were out of home for long time	0.015	1.819	1.121	2.951
Who encountered local irritation	0.031	0.622	0.404	0.959
Who developed Lipohypertrophy	0.029	0.595	0.374	0.947

Table 5: The adjusted odd ratio (AOR) that predict adherence to insulin self administration of diabetes patients in Endocrinology unit of TASH 2014 (n=378)

Ever missed taking insulin injection	Sig.	AOR	95% CI for AOR	
			Lower	Upper
Intercept	0.001			
Occupation	0.246	1.068	.956	1.194
Who have Heart disease	**0.001**	2.647	1.470	4.766
Who stopped taking insulin when they feel better	**0.005**	3.309	1.423	7.698
Adverse reaction at injection site	0.050	1.663	1.001	2.765
Taking insulin when they were out of home for long time	**0.031**	0.565	.336	.948
Who encountered local irritation	0.789	0.927	.533	1.614
Who developed Lipohypertrophy	0.104	1.577	.911	2.729

Multivariate regression analysis identified who stopped taking insulin when they feel better, who have Heart disease and those taking insulin when they were out of home for long time as independent factors for non adherence for insulin self administration.

CHAPTER SIX: DISCUSSION

This study revealed that the mean duration of diabetes was 12.61+ 7.48 years with CI of 95% (5.13–20.9) with minimum of one year and maximum of 40 years. This finding is almost similar with the study conducted in TASH previously [56]. A poor adherence to the treatment of chronic diseases negatively influences effectiveness in routine clinical practices [34-38]. Poor adherence to the treatment for diabetes results in avoidable suffering for the patients, development of complications of diabetes and their associated individual, societal, health system and economic costs[3]. From a study in India, of the 55 patients who self-identified as taking insulin by injection to treat either type 1 or type 2 diabetes, 57% of the respondents reported omitting insulin injections [43]. In this study one in three (33.1%) of the respondents are found to be non-adherent to insulin injection. Non-adherent rate was less in the study area, when compared with study done previously in India [43. This difference might be due to influence of health education given to clients in the study area. According to recent surveys conducted elsewhere, at least one third of patients fail to take their insulin as prescribed [14]. In contrast to this, about nine in every 10 participants didn't take his/her insulin injections at about the same time daily as recommended. This might be due; the respondents might be too busy at outdoor work to follow their treatment plans and when they fed-up may not take or administer insulin as well as life style difference. This study depicted that 26 (6.9%) of respondents stopped taking their medication when they were feeling better and 12 (3.2%) when they were feeling worse. This finding is similar with study done in French [42].

In this study insulin syringe 366 (96.8%), insulin pen 8 (2.1%), needle with separate syringe 4 (1.1%) of participants were used these type of insulin device. The study conducted in India showed majority of the responders in the study were using insulin syringe. Insulin syringes used

by 203(68.1%), insulin pen which is used by 79(26.5%) of subjects. A few subjects a few subjects (5%) use separate needle and syringe for insulin injection [60]. when compared with this study insulin syringe utilization was common, while insulin pen utilization in India common. This might be due to availability of insulin pen differences between Ethiopia and India. In this study regarding dosing schedule of insulin the most common frequency was twice a day 368 (97.4%), once a day 7 (1.9%) and more than 2 times per day 3 (0.8%). Dosing schedule of insulin in the study done in India there were 215(71.9%) twice a day, 70 (23.4%) once a day and 14(4.7%) were on more than2 times a day insulin [60]. This discrepancy might happen due to management protocol and socioeconomic deference. Regarding frequency of using a needle about half 195 (51.6%) of participants reused single needle for 2-6 days, followed by 173 (45.8%) 7 or more days, only 4 (1.1%) of respondents use a single needle once as recommended. The same study in India showed that two third of the responders were reused insulin needle more than once. Merely 75(24.9%) of responders were using needle only once as recommended [60]. This utilization of needle only once as recommended prevailing problem in this study. This might be not due to lack of knowledge and experience but might be do you to socio economic differences between study areas. The study finding in this study regarding visit to health care provider shows once in a month 17 (4.5%), once in 3 month100 (26.5%) and once in 6 month 261 (69.0%). In contrast to there were 197(65 %) responders who were visiting their health care providers every month, one every 3month were 67 (22.1%) and once every six months were 29 (12.9 %) [61]. This might be due to shortage of specialized hospital and high patient flow in the study area. In this study among 378, 243 (64.3%), respondents were developed signs like lipohypertrophy at injection site. Study conducted in Spanish found that lipohypertrophy (29%) at injection sites [61]. This might be due lack of critical instruction regarding injection site

rotation to the respondent or lack of frequent change of their injections site to distribute systematically or both in this study area. In this study the most 266 (69.6%) of respondents commonly were used abdomen and upper thigh 325 (86.0%) as injection site. In study conducted in Spanish Similarly abdomen and thigh of the participants had used as common injection site [61]. This study revealed that 143 (37.8%) of respondents were felt anxiety / Stress when they start insulin self administration. The study conducted in southeastern Brazil revealed that almost similar finding 45.8% of respondents said they were worried about needles and were bothered by them when they started insulin treatment [62].

Strength and Limitation of the study

Strength of the study

This study used a standardized structured questionnaire and 100% response rate.

The study can contribute a lot as baseline information and give insight on the insulin self administering issue for future studies.

Limitation of the study

Since the study design was cross-sectional method, the direction of causal relationship between variables can’t always be determined.

Use of convenient sampling technique may limit this study not to generalize towards source population.

Only TASH hospital was select for the study due to shortage of time and resources as a result it was one constraint to minimize the scope of this study.

CHAPTER SEVEN: CONCLUSION AND RECOMMANDATIONS

7.1 Conclusion

One third of the respondents are found to be non-adherent to insulin injection. The most common reason for non adherence to insulin self administration were forgetting time of injection, deliberately, the nature of their work/schedule of work, they don't like administering insulin medications as well as feeling better and feeling worse. Almost all participants have been using one needle for two or more days, only 4 (1.1%) participants have been using single needle once as recommended. Multivariate regression analysis identified who stopped taking insulin when they feel better, who have developed heart disease and who took insulin when they were out of home for long time as independent factors for non adherence for insulin self administration.

7.2 Recommendations

- One third of the respondents are found to be non-adherent to insulin self administration hence, there is a need to design a means for patients to understand risk and complication of non adherence to insulin self administration. For those patients who do reuse insulin needle, nurses should check frequently injection sites as reusing needle causes infection. The best current preventative and therapeutic strategies for lipohypertrophy include use of rotation of injection sites with each injection, using larger injecting zones and non-reuse of needles

The government, nongovernmental organizations (NGOs), volunteers and concerned body should provide syringe and needles for diabetes patients to minimize the risk of injection site infection.

This research also suggests that future research should focus on problems that may impair safe insulin self-administration and insulin administration technique and effects of faulty practice among diabetes patients.

ANNEXES

Annex i: References

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Annex ii. Questionnaire

i. **Information sheet**:

Good morning/afternoon [According to its convenience]. I am _____ who is the data collector for a research to be conducted by Yusuf Gerada, a Master's student at Addis Ababa University, Department of Nursing and Midwifery. Today, I am here to collect information on "*adherence to insulin self-administration and associated factors among outpatient diabetic patients in Endocrinology unit of Tikur Anbessa specialized Hospital, Addis Ababa, Ethiopia,"* where it is expected to identify the root causes for poor or non-adherence to insulin self administration and associated factors and it would help for further mitigation of poor adherence and complication of diabetes, so I want to ask you some questions.

There is no immediate and direct benefit in terms of money that you will earn from this information; rather I hope, you might get moral satisfaction due to the information you give now, where it is a resource in contributing for the community welfare in general specially for those diagnosed with diabetes and taking insulin self injection for prolonged duration. We believe that the study findings will help in order to improve adherence o insulin self injection and concerns from health care providers.

If you take part in the study it will not take us more than 30 minutes, your name will not be included in the information, I promise to keep the confidentiality of your reply. There is no risk that comes due to your involvement in the study. Your participation is completely voluntary and you have full right to withdraw at any time in the course of data collection even after you get involved without being subject to any intimidation and incrimination to you. Your choice either to involve or not will not compromise any services that you ought to get from this unit/hospital. However, I hope that you will participate in this study considering that single genuine information you provide will contribute a lot to the fulfillment of the objective of the study.

As a result, I request you sincerely to participate in the interview by providing authentic answers.

Do you have any questions that you need to be clarified more?

If you have any question you can contact the principal investigator at any time convenient for you using the following address:

Address: Addis Ababa University College of Health Sciences School of Allied Health Sciences, Department of Nursing and Midwifery

Cell phone: +251-913-109671

E-mail: yusufgerada@yahoo.com

ii. **Informed consent form**

I have been briefly informed about the study and I clearly understood the objective.

a. Since it doesn't affect my personal life, I agreed to take part in the study. Consequently, I here approve my consent to take part in the study as an interviewee with my signature.

Agreed to participate ☐ →Sign and proceed to interview

b. Not agreed to participate ☐ → Thank the respondent and End the interview

Signature _____

Date _____

Questionnaire Number
Date: _____
Health Institution: _____
Interviewer: _____

No.	Questions	Responses	Code
Part I: Socio - demographic Characteristics of Study Participants			
1.	Age (How old are you?)	_____ years	
2.	Gender	1. Female 2. Male	
3.	Residence	1. Urban 2. Rural	
4.	Ethnicity	1. Amahara 2. Oromo 3. Guragie 4. Tigre 5. Silte 6. Others [Specify] _____	
5	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others [specify] _____	
6.	Marital status	1. Single 2. Married 3. Divorced 4. Widowed 5. Cohabit 6. Others	
7.	Level of education	1. No formal education 2. Primary education (1-8) 3. Secondary education (9-12) 4. Tertiary education (Diploma and above)	
8.	Current Occupation	1. Housewife 2. Farmer 3. Business/Self employed 4. Daily worker 5. Government employee 6. NGO/private sector employee 7. Student 8. Others _____	

9.	Monthly income	<500 500-1000 >1000	
Part II: Diabetes History			
10.	How long you have been with diabetic?	_____ years	
11	Who told you that that you are suffering from Diabetes mellitus?		
12	How long you have been on insulin therapy?	_____month (s) or _____ year(s)	
13	What type of insulin device do you use?	1. Insulin pen 2. Insulin syringe 3. Needle with separate syringe 4. Others _____	
14	What is dosing schedule for insulin?	1. once a day, 2. twice a day, 3. more than 2 times per day 4. other	
15.	How often do you use one needle?	1. Once 2. day 3. 2-6 days 4. more than 7days	
16.	How often do you visit health care provider?	1. once in a month 2. once in 3 month 3. once in 6 month	
17.	Where do you bring your Insulin	1. Purchase 2. Free distribution	
18	Do you Purchas insulin and syringes?	1. Yes 2. No	
19.	How can you assess the cost of your anti-diabetic medications?	1. Cheap 2. Costly	
20	Do you have Regular follow up visit	1. Yes 2. No	
21	Please indicate below which chronic condition(s) you have?	1. Heart diseases 2. Lung disease 3. Hypertension 4. High cholesterol 5. Others (specify) ----------	

Part III: Practice (TAKING YOUR MEDICINE			
1.	Do you take your insulin injections at about the same time daily	1. Yes 2. No	
2.	When insulin should be administered?	1. Before food 2. After food 3. Along with food 4. Before sleep	
3.	Do you ever forget to take your medicine?	1. Yes 2. No	
4.	If 'yes' How often?		
5.	Do you ever miss doses of your medicine on purpose?	1. Yes 2. No	
6.	If yes, then why?	a) You cannot afford to buy the anti-diabetic medications always. b) The nature of your work/schedule of your work makes it impossible. c) You don't like taking/administering anti-diabetic medications d) You cannot take or administer medication(s) e) Medications you are taking are too many f)You forget to take medications g) Others specify _____	
7.	Do you stop taking your medicine when you are feeling better?	1. Yes 2. No	
8.	Do you stop taking your medicine when you are feeling worse?	1. Yes 2. No	
9.	Do you ever not take your medicine for any other reason?	1. Yes 2. No	
10.	If yes, then why?	1. My medicine is too expensive 2. I take too many medicines 3. My medicines are too complicated 4. My medicines are an inconvenience 5. I am not sure my medicine is beneficial 6. Other:_____	
11.	Is there any adverse reaction at insulin injection site?	1. Yes 2. No	
12.	How many of your recommended insulin injections did you take in the last 7 days that you were		

	supposed to?		
13.	Where do you store/keep your insulin		
14.	Tell me sites of injection as possible		
15.	Do you take your insulin as a carry-on when you are out of home for long time?	Yes No	
16.	Have you ever encountered local irritation?	Yes No	
17.	If yes, What do you think the cause?	1. Cold insulin, 2. Not change of site 3. Other	
18.	Do you discard Insulin after one month opening?	Yes No	
19.	Have you ever developed this signs at injection site ?	i. Lipohypertrophy 1. Yes No ii. Open wound 2. Yes No iii. Infection 3. Yes No	
20	What was your perception about insulin at the time when you agree to use insulin? Explore.		

This is all what I want to ask you. Thank you for spending your time and valuable information you gave us. Do you have any question that I can address for you?

_____

_____

_____

የመረጃና የፈቃደኝነት ማረጋገጫ

ሀ. የጥናቱ መረጃ

እንደምን አደሩ፣ እንደምን ዋሉ፣ እንደምን አመሹ [እንደአስፈላጊነቱ]፡፡

ስሜ----------እባላለሁ፡፡ እኔ የመጣሁት በአዲስ አበባ ዩኒቨርሲቲ የሁለተኛ ድግሪ ተማሪ በሆነው በተማሪ ዩሱፍ ገራዳ እየተሰራ ባለዉ ጥናታዊ ፅሁፍ ዙሪያ በመረጃ ሰብሳቢነት ሲሆን በዛረሬው እለት አዚህ የተገኘሁት እንሱሊንን በጤና ባለሙያ እንደታዘዘላቸው ራሳቸውን የሚወጉ የስካር ህመማንን በሚመለከት በሚደረገው አነስተኛ ጥናት ዙሪያ መረጃ ለመሰብሰብ ነዉ፡፡ ስለሆነም አንዳንድ ጥያቄዎችን ላቀርብልዎ እፈልጋለሁ፡፡ በዚህ ጥናት በመሳተፍዎ የሚያገኙት ቀጥተኛ የሆነ ጥቅም የለሌ ሲሆን ነገር ግን ከዚህ ጥናት የሚገኘዉ ዉጤት በቀጥታ ማህበረሰቡን የሚጠቅም ሲሆን ለእርስዎ ደግሞ እርካታን እንደሚሰጥዎት ተስፋ አደርጋለሁ፡፡

ስምዎት ከመረጃው ጋር አይካተትም፤የሰጡኝን መረጃ ሁሉ በሚስጥር እንደምጠብቅልዎ ቃል እገባለሁ፡፡ ይህንንም ለማድረግ ከእኔ ጋር ወደ ግማሽ ሰዓት እንቆያለን፡፡ ይህ ጊዜዎትን የሚይዝ ቢሆንም መላውን የስካር ህመማንን ሊጠቅም የሚችል የእገልግሎት ጥራት ማሻሻያ ለማድረግ የሚያግዝ በመሆኑ እንዲተባበሩኝ እጠይቅዎታለሁ፡፡ የተወሰኑ ደቂቃዎች ባነጋግርዎ ፈቃደኛ ነዎት?

ፈቃደኛ ነኝ ☐ ፈቃደኛ አይደለሁም ☐ አመሰግናለሁ!

ለ. የፈቃደኝነት ማረጋገጫ

የምርምር ጥናቱ ክፍል የሆኑ መረጃዎችና ሂደቶች ተብራርተውልኛል፡፡ እኔም በተብራራልኝ መንገድ ተረድቻለሁ፡፡ ምርምሩ ምንም አደጋ የማያስከትል በመሆኑ ለሚያደርጉት የተሳትፎ ክፍያ አይኖረውም፡፡

ስለዚህ በዚህ የምርምር ጥናቱ ላይ ለመሳተፍ ፈቃደኛ መሆኔን በፊርማዬ አረጋግጣለሁ፡፡

ፊርማ ----------

ቀን ----------

ቀን ----------የጤና ድርጅቱ ስም----------የጠያቂ ስም [ኮድ]----------

ተ.ቁ	ጥያቄ	መልስ	Code
ክፍል አንድ፤ አጠቃላይ መረጃ (የተሳታፊው የማህበራዊና ኢኮኖሚያዊ መረጃ)			
1.	እድሜዎት ስንት ነው?	_____ ዓመት	
2.	ጾታ	1. ወንድ 2. ሴት	
3.	የመኖሪያ ቦታ	1. ከተማ 2. ገጠር	
4.	ብሔር	1. አማራ 2. ኦሮሞ 3. ጉራጌ 4. ትግሬ 5. ስልጤ 6. ሌላ [ይገለጽ] _____	
5	ሐይማኖት	1. ኦርቶዶክስ ክርስቲያን 2. ሙስሊም 3. ፕሮቴስታንት ክርስቲያን 4. ካቶሊክ ክርስቲያን 5. ሌላ [ይገለጽ] _____	
6.	የጋብቻ ሁኔታ	1. ፈጽሞ ያላገባ/ች 2. ያገባ/ች 3. የፈታ/ች 4. በሞት የተለያዩ 5. አብሮ በመኖር የሚደረግ ግንኙነት 6. ሌላ [ይገለጽ] _____	
7.	የእርሶ የትምህርት ደረጃ	1. መደበኛ ትምህርት ያልተማረ/ች 2. አንደኛ ደረጃ [1-8 ክፍል] 3. ሁለተኛ ደረጃና [9-12 ክፍል] 4. ዲፕሎማ እና ከዚያ በላይ	
8.	የሥራ ሁኔታ (የእርሶ)	1. የቤት እመቤት 2. ገበሬ 3. እራሱን የቀጠረ/የግል የሚሰራ 4. የቀን ሥራ 5. ደመወዝተኛ [የመንግስት ተቀጣሪ] 6. መንግስታዊ ያልሆነ ድርጅት ተቀጣሪ 7. ተማሪ 8. ሌላ[ይገለጽ] ----------	
9	ወርሃዊ ገቢ	1. <500 2. 500-1000 3. >1000	
ክፍል ሁለት፤ የስኳር በሽታው ታሪክ			
10.	ከህመሙ ጋር ምን የህል ጊዜ ኖረዋል	_____ ዓመት	
11	እርሶ የስኳር ህመምተኛ መሆንዎት ማን ነገረዎት?		

12	እንሱሊን መውሰድ ከጀመሩ ምን የህል ጊዜ ነው?	_____ ወር _____ ዓመት	
13	እንሱሊንን ለመወጋት ምን አይነት መሳሪያ ይጠቀማሉ?	1. የእንሱሊን ፔን 2. የእንሱሊን ስሪንጅ 3. ከስሪንጅ ጋር የሚገጣጠም መርፌ 4. ሌላ [ይገለጽ] ----------	
14	የእንሱሊን መዉሰጃ ጊዜዎ መቼ ነው?	1. በቀን አንድ ጊዜ 2. በቀን ሁለትጊዜ 3. በቀን ከሁለት ጊዜ በላይ 4. ሌላ [ይገለጽ] ----------	
15.	አንድ የእንሱሊን መርፌ ለምን ያክል ጊዜ ይጠቀማሉ?	1. አንድ ጊዜ ብቻ 2. ለአንድ ቀን 3. ከ2-6 ቀናት 4. ከ7 ቀናት በላይ	
16.	ከጤና ባለሙያ ጋር በየስንት ጊዜ ይገናኛሉ?	1. በወር አንዴ 2. በ3 ወር አንዴ 3. በ6 ወር አንዴ	
17.	እንሱሊንን ከየት ነው የሚያገኙት?	1. በግዥ 2. በነፃ ከሚታደል	
18	እንሱሊን እና መርፌ ይገዛሉ?	1. አዎ 2. አይደለም	
19.	የእንሱሊን ዋጋን እንዴት ይገመግሙታል?	1. ዉድ ነው 2. ርካሽ ነው	
20.	መደበኛ የሆነ ክትትል አለዎት ወይ?	1. አዎ 2. አይደለም	
21.	ከሚከተሉት በሽታዎች የትኛው እንዳለብዎት እባክዎት ይንገሩን	1. የልብ ህመም 2. የሳምባ ህመም 3. የደም ግፊት 4. ከፍተኛ ኮሌስትሮል 5. ሌላ [ይገለጽ] ----------	

ክፍል ሶስት፡ ተግባር (ስለመድሃኒት አወሳሰድ)

1.	እንሱሊንን በየቀኑ በተመሳሳይ ሰዓት ይወጋሉ?	1. አዎ 2. አይደለም	
2.	እንሱሊን መቼ ነው መወጋት ያለበት?	1. ከምግብ በፊት 2. ከምግብ በኃላ 3. ከምግብ ጋር 4. ከእንቅልፍ በፊት	
3.	እንሱሊን መወጋት በመርሳት ሳይወስዱ የቀሩበት ጊዜ አለ?	1. አዎ 2. አይደለም	
4.	መልስዎ አዎ ከሆነ ምን ያክል ጊዜ?		
5.	ሆን ብሎ እንሱሊን መወጋት አቁርጦ ያዉቃሉ?	1. አዎ 2. አይደለም	
6.	መልስዎ አዎ ከሆነ ለምን?	1. መድሃኒት መግዛት ባለመቻል 2. አለመመቸት 3. መድሃኒት መወጋት በመጥላት 4. መድሃኒት መወጋት ባለማወቅ	

		5. በርካታ መድሃኒት ስለምወስድ 6. መድሃኒት መወጋት በመርሳት 7. ሌላ [ይገለጽ] ----------	
7.	ህመምዎ ከተሻለዎት መድሃኒት መወጋት ያቆማሉ?	1. አዎ 2. አይደለም	
8.	ህመምዎ ከከፋብዎት/ከባሰቦት መድሃኒት መወጋት ያቆማሉ?	1. አዎ 2. አይደለም	
9.	ባጠቃላይ በተለያዩ ምክንያቶች መድሃኒት መወጋት አቋርጦ ያዉቃሉ?	1. አዎ 2. አይደለም	
10	መልስዎ አዎ ከሆኔ ለምን?	1. ዋጋ በጣም ዉድ ስለሆኔ 2. ብዙ መድሃኒት ስለሚወስድ 3. መድሃኒቶቼ በጣም አስቸጋሪ ስለሆኑ 4. መድሃኒቶቼ አመቺ አይደሉም 5. ስለመድሃኒቱ ጠቃሚነት እርግጠኛ ስላልሆንኩኝ 6. ሌላ [ይገለጽ] ----------	
11	እንሱሊን በሚወጉበት ቦታ ላይ የተነዳኝ ችግር ተከስቶ የውቃል?	1. አዎ 2. አይደለም	
12	ባለፉት 7 ቀናት ዉስጥ መወጋት ከሚገባዎት የእንሱሊን መጠን ምን ያክሉን ወስዷል?		
13	እንሱሊንን የት ነው የሚያስቀምጡት?		
14	እንሱሊን የሚወጋበት የሰዉነት ክፍሎችን ይንገሩኝ		
15	ከቤት ውጪ ረዥም መንገድ ሲጓዙ እንሱሊንን ይዞ ነው የሚሄዱት?	1. አዎ 2. አይደለም	
16	እንሱሊንን መወጋት ከጀመሩ በቆዳ ላይ ችግር ተከስቶ ያቃል?	1. አዎ 2. አይደለም	
17	መልስዎ አዎ ከሆኔ ምክንያቱ ምን ይመስልዎታል?	1. ቀዝቃዛነት 2. እንሱሊን የሚወጋበት ቦታ አለመቀየር 3. ሌላ [ይገለጽ] ----------	
18	እንሱሊንን ተከፍቶ ከአንድ ወር በኃላ የስወግዱታል?	1. አዎ 2. አይደለም	
19	መርፌ በሚወጉበት ቦታ ላይ እነዚህ ምልክቶች ታይቶ ያቃል ወይ?	i. የመበለዝ ምልክት 1.አዎ 2.አይደለም ii. ግልፅ ቁስል 1. አዎ 2. አይደለም iii.ማመርቀዝ ምልክት1.አዎ 2. አይደለም	
20	እንሱሊንን ለመጀመር የተስማሙ ጊዜ አመለካከትዎ ምን ነበር? ይግለፁ		