

ADDIS ABABA UNIVERSITY
COLLEGE OF MEDICINE AND HEALTH SCIENCES
DEPARTMENT OF FAMILY MEDICINE



**KNOWLEDGE, ATTITUDE AND PRACTICE OF PREDIABETES SCREENING AND
CARE AMONG PRIMARY HEALTH CARE PROVIDERS OF SELECTED HEALTH
CENTERS AT LIDETA SUB-CITY OF ADDIS ABABA**

A Thesis by

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Knowledge, Attitude and Practice of Prediabetes Screening and Care
among Primary Health Care Providers of Selected Health Centers at
Lideta sub-city of Addis Ababa

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**A thesis submitted to Addis Ababa University, College of Health
Sciences, Department of Family Medicine for Partial Fulfillment of the
Requirements for the Specialty in Family Medicine**

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Addis Ababa

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DECLARATION

I, Mikiyas Negatu Demessie, hereby declare that this thesis for Postgraduate Specialization in Family Medicine is done by me and not copied from other studies in any other university, and all resources (references) used for this thesis are acknowledged.

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We, examiners of the final defense, by having read and evaluated this thesis entitled **“Knowledge, Attitude and Practice of Prediabetes screening and Care among Primary Health Care Providers of selected Health Centers at Lideta Subcity of Addis Ababa”**, have examined the candidate. Therefore, we certify that the thesis has been accepted in partial fulfillment of the Specialization in Family Medicine Course.

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Stamp of AAU CHS SOM

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ABBREVIATION AND ACRONYMS

ADA	American Diabetic Association
AOR	Adjusted Odds Ratio
BMI	Body Mass Index
CI	Confidence Interval
DM	Diabetes Mellitus
FBS	Fasting Blood Sugar
Hba1c	Glycosylated Hemoglobin
IDA	International Diabetic Association
IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
Mg/dl	Milligrams Per Deciliter
MOH	Ethiopian Ministry of Health
SRS	Simple Random Sampling
SPSS	Statistical Package for Social Science
HO	Health Officer
WHO	World Health Organization
Bsc	Bachelor of Science
KAP	Knowledge Attitude Practice
NCD	Non communicable disease
T2DM	Type 2 Diabetes Mellitus
PHCP	Primary Health care Provider
CPD	Continuous Professional Development

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ABSTRACT

Background: Prediabetes is a state of hyperglycemia with glucose levels above the normal range but below the level of diabetes indicating a future risk for type 2 DM, which can be treated with lifestyle changes. In Ethiopia, the prevalence of Type 2 DM is 3.3% (2021) (1). And Prediabetes prevalence was 6.8% (2019) (2). If not detected early and not treated, it can lead to the development of Type 2 diabetes and diabetes related complications. Therefore early screening and detection is crucial at Primary care level. .

Objective: The aim of the study is to assess knowledge, attitudes, and practice of primary health care providers (Doctors, BSC Nurses and Health officers) about Prediabetes screening and care in selected Health Centers at Lideta Subcity.

Methods: Cross-sectional study was conducted on 120 eligible Health Professionals with 10% nonresponse rates (132) from August 1 to August 31, 2023 at five randomly selected Health centers in Lideta Sub-city. Using structured questionnaire (Paper based and online survey form) which has four sections, questions were asked to assess KAP of Health Professionals. Then Quantitative and logistic regression analysis used to analyze data and results were interpreted.

Results: A small percentage (24.2%) had good knowledge. Knowledge scores were lower for those who had practiced for more than ten years and for five to ten years than for those who had practiced for less than five years ($P=0.026$, $P=0.002$). 79.5% of respondents correctly answered the two practice questions, and 68.9% of respondents had a positive attitude toward Prediabetes screening.

Conclusions: Knowledge of Prediabetes screening and care were low as year of practice increased and higher as Profession level increased. Attitude towards were better among Health professionals. PCPs had good practice of recommending Lifestyle management.

Key words: Primary care providers, Knowledge, Attitude and Practice, Pre-diabetes screening and management.

1 INTRODUCTION

1.1 Background

Diabetes is a long-term metabolic illness marked by high blood glucose (blood sugar) levels. Serious damage to the heart, blood vessels, eyes, kidneys, and nerves can result from diabetes (3). There are primarily two forms of diabetes mellitus: type 1 and type 2. The most prevalent is type 2 diabetes, which often affects adults and is brought on by the body's insufficient or resistant response to insulin (3)

Type 2 diabetes mellitus (T2DM) is a global public health concern becoming more prevalent in Ethiopia. In Ethiopia, T2DM has been recognized as a major non-communicable disease that requires urgent attention. In Ethiopia, according to systematic review and meta-analysis done in 2021, the pooled prevalence of T2DM was 6.5% (4). IDF report, the prevalence of diabetes among Ethiopian adults is 3.2% (5). This increase is expected to continue unless appropriate preventive and control measures are implemented. The same review's conclusions demonstrated that in the Ethiopian population, type-2 diabetes was substantially correlated with characteristics such as age 40 years or older, illiteracy, cigarette smoking, body mass index 25 kg/m², familial history of diabetes, history of hypertension, and physical inactivity (4).

When a patient's blood sugar level is below the requirements for type T2DM, but above the normal level, it is referred to as Prediabetes and it means that the patient has a higher chance of developing T2DM (6). Proper management of Prediabetes can reduce the chance of acquiring type 2 diabetes. Prediabetes is defined based on laboratory values as hemoglobin A1c (HbA1c) level of 5.7–6.4%, two-hour post-prandial glucose levels of 140–199 mg/dL, and fasting blood glucose level of 100–125 mg/dL.

Around 537 million adults (20–79 years old) globally have diabetes mellitus (DM), and 541 million have impaired glucose tolerance (IGT), which puts them at high risk of acquiring Type 2 diabetes, according to an IDF report from 2021 (7). In 2019, the International Diabetic Federation (IDF) Africa Region has reported that approximately 19 million and 47 million persons (20–79) were living with diabetes and impaired glucose

tolerance (IGT), respectively (5). By 2045, estimates indicate that 47 million and 110 million people will have Diabetes and impaired glucose tolerance (5).

One of the key strategies for preventing and controlling T2DM is screening individuals for the disease. Screening helps identify individuals with Prediabetes who can then receive timely interventions to prevent Diabetes and its complications. Health professionals, particularly those working at health centers, play a critical role in screening individuals for Prediabetes.

Having an updated knowledge and understanding of the burden of Prediabetes in the society is the key to PHCP, for successful screening and initiating appropriate management to the problem since they are close to the community.

2 STATEMENT OF THE PROBLEM

WHO reports show that DM is among the most common disease in the world. The global prevalence of IGT is estimated to be 7.5% (374 million) in 2019 and projected to be 8.0% (454 million) by 2030 and 8.6% (548 million) by 2045 (8). The global prevalence of Prediabetes is increasing, affecting an estimated 552 million people by 2030 (9). A study done in Deessie Ethiopia showed a prevalence of Type 2 Diabetes and prediabetes of 6.8% and 15.7%, respectively (2) with higher prevalence of prediabetes than the global estimate 7.5%.

But the current KAP of PHCPs about prediabetes screening and care in Ethiopia in general as well as Addis Ababa is not well known. This study in Lideta subcity of Addis Ababa will serve as baseline knowledge of pre-diabetes screening and management practices among PHCPs, and determine the KAP status among health professionals involved in pre-diabetes screening.

3 JUSTIFICATION OF THE STUDY

Diabetes Mellitus is a chronic metabolic disease that has become a major health concern worldwide both in low/high income countries. The prevalence of Diabetes is rapidly increasing around the world, particularly in low and middle-income countries. Ethiopia is witnessing a significant rise in the prevalence of T2DM. Early diagnosis and management of Prediabetes is crucial to prevent or reduce Diabetes incidence and its complications, including cardiovascular diseases, neuropathy, and renal failure.

Health professionals, including physicians, nurses, and health officers, play key role in the screening and management of prediabetes at health centers, as they are the first point of contact for patients seeking healthcare services. However, due to lack of proper knowledge, PHCP couldn't play this critical role in time by giving accurate diagnosis and management.

Therefore, this proposed study aims to assess the knowledge and awareness of pre-diabetes screening among health professionals working at selected health centers in Lideta subcity Addis Ababa. The study findings will provide valuable insights into the current state of pre-diabetes screening and management practices among health professionals in Addis Ababa and identify the gaps that need to be bridged through targeted training and interventions.

4 LITERATURE REVIEW

4.1 Theoretical Literature Review

Pre-diabetes screening is important for early diagnosis and management of the disease because these patients are at high risk of developing Diabetes. Basic tests used to screen for and diagnose Diabetes can be used to identify Prediabetes.

Current ADA diagnostic criteria uses IGT (Impaired Glucose tolerance) of 2hBG >140mg/dl, IFG using the 100mg/dl cutoff (100-125mg/dl) which is more predictive of cardiovascular risk profile and HbA1c of 5.7% to 6.4% defines prediabetes.

Cardiovascular risks are major complications besides development of Diabetes. Studies show that patients with Prediabetes can develop CAD and diastolic heart failure even before progression to Diabetes (10).

Prediabetes management doesn't follow "one size fits all" principle. One of the four domains of chronic disease prevention known as Health care System Interventions is important one regarding Prediabetes screening and management. This is used to improve the quality of clinical and other preventive services (11). Using this approach early detection of prediabetes and reduction of Overt diabetes can be achieved by using interventions.

Using "Theory of Planned Behavior (TPB) which proposes that attitudes, subjective norms, and perceived behavioral control are important predictors of intentions to engage in a health behavior (12). Attitudes refer to a Primary care Personnel's' positive or negative evaluation of the pre-diabetes screening, subjective norms refer to perceived ethical pressure to engage or not engage in the screening procedure, and perceived behavioral control refers to the ease or difficulty of doing screening process.

To conclude, using the TPB theoretical framework can help to design targeted interventions to improve the level of knowledge and uptake of pre-diabetes screening among health professionals.

4.2 Empirical Literature review

4.2.1 Global and national overview

Globally the prevalence of T2DM is continuously increasing for decades, and is now a major health concern (8).

In USA, Knowledge and perceptions of primary care physicians about Prediabetes was assessed and results showed that only 36% of the physicians referred patients with Prediabetes to diabetes prevention lifestyle modification as an initial management. 43% said they start Biguanides for Prediabetes management. Only 15% of the doctors know all risk factors of Prediabetes. In the USA survey conducted among the academic family medicine physicians showed a moderate knowledge on Prediabetes diagnostic parameters but limited knowledge on diabetes prevention programs (13)

In a 2022 review done on pre-diabetes awareness among different specialties of Southeastern European physicians, Endocrinologists and Diabetologists had better awareness on prediabetes compared to GPs and non-endocrine specialists (cardiologists, neurologists, and surgeons). Regarding practice duration, junior physicians had more knowledge of prediabetes diagnostic cut-off values than senior Physicians (14)

A Cross-sectional survey done in 2021 in India showed that all participants were aware of prediabetes, but majority were not actively involved in sieving out the population having prediabetes. While only specialist doctors took this condition seriously by detecting and providing advices on lifestyle modifications and pharmacotherapy early (14).

PHCPs Awareness about Prediabetes was studied in Riyadh, Saudi Arabia which assessed the knowledge of primary care physicians about the screening and diagnostic criteria as well as management of Prediabetes. The study was conducted in primary healthcare centers of Riyadh through the multistage random sampling technique which included both GPs and family physicians. Primary care physicians in Riyadh had awareness about Prediabetes but lacked knowledge of screening criteria and complications of Prediabetes. (14)

A cross-sectional survey carried out among PHCPs working in healthcare centers in Karary and Khartoum of Sudan in 2019 showed among total respondents, 60% showed acceptable knowledge, positive attitude, and good Prediabetes practices (15).

KAP of Prediabetes Management among HCPs in Four Tertiary Hospitals in Nigeria was evaluated using an observational cross-sectional method. Out of total responders, 22.9% correctly identified 10 risk factors for Prediabetes, and 19.6% & 14.5% correctly identified the lower and upper values of fasting blood glucose for diagnosing Prediabetes, respectively. Only 2.8% and 7.3% of respondents were familiar with the lower and upper cut-off levels of HbA1c (5.7% to 6.4%) respectively (16).

A community-based cross-sectional study done in Debre Tabor town in 2021 and the magnitude of undiagnosed DM and Prediabetes was 4.5% and 14.5%, respectively concluding that there is a high prevalence of undiagnosed diabetes and Prediabetes in the town. (17).

A study done in Dessie town revealed that T2DM and Prediabetes had 6.8% and 15.7%, prevalence respectively.

A cross-sectional study at Gondar University hospital in 2020 found a Prediabetes prevalence of 16.6% (18).

4.2.2 Factors of KAP of Prediabetes screening in Prediabetes screening and care

Health profession: literatures revealed that KAP towards Prediabetes screening and care varies according to the academic background of the Health Professional. According to 2022 review better awareness about Prediabetes was found among Endocrinologists and diabetologists compared to GPs and other Specialists (14). In India only Specialized Doctors took Prediabetes seriously by screening, diagnosing and providing early management (14). In China Professional Levels also showed significant association with knowledge scores where scores increased with increasing professional level (19).

Duration of practice: Primary care providers who are recent graduates were found to have better KAP towards Prediabetes screening and care. In a US study, compared to fresh graduates, PHCPs who practiced for > 10 years were less likely to know the correct recommendation for physical activity (20). In a study in China, Practice duration had association with the knowledge and attitudes scores of Prediabetes. Those with <10 years of experience had the highest knowledge score, whereas the attitude score was highest among individuals with 10–20 years of experience (19).

Sex of primary care Providers: Studies have found differences in mean of KAP scores among male and female participants. A study in China showed Female PHCPs had more Prediabetes related knowledge and practices than their male counterparts. They also had higher mean attitude scores; (19)

Site of practice of Primary Health care provider: A study has also showed that working in township hospitals was a predictor of having higher Prediabetes knowledge and attitude scores. (19)

5 CONCEPTUAL FRAMEWORK

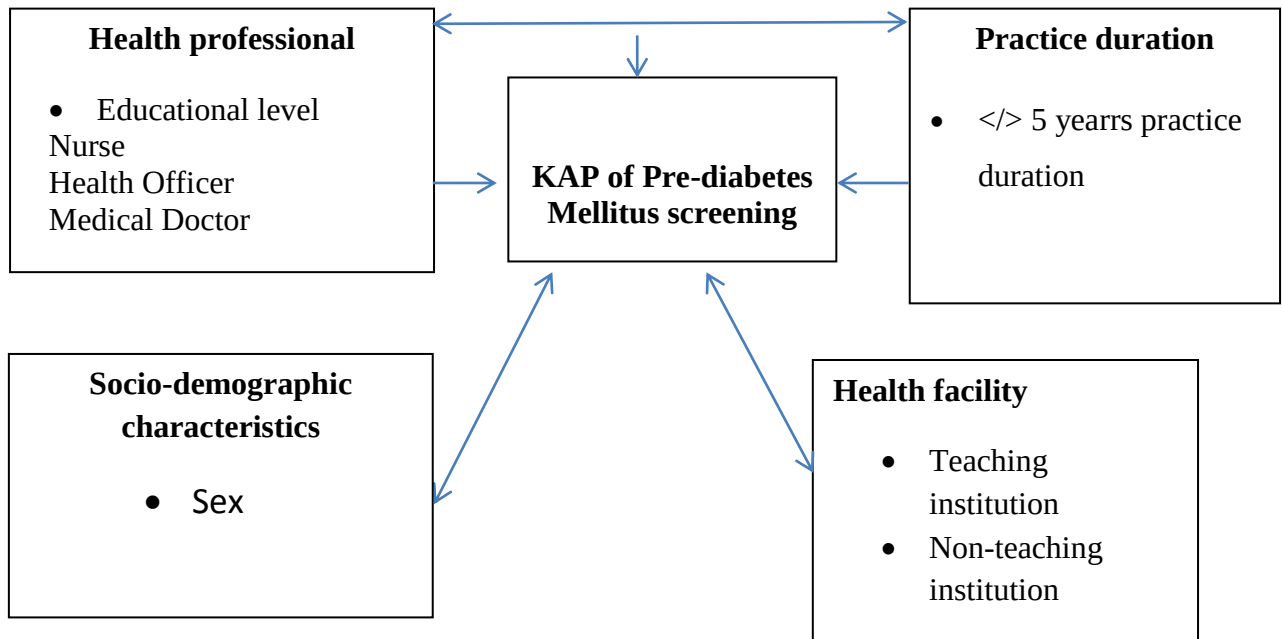


Figure.1 Conceptual framework of factors associated with screening of pre-diabetes

6 RESEARCH OBJECTIVE

6.1 General Objective

- To examine the Knowledge, Attitude and practice of Primary care Providers regarding Pre-Diabetes Screening and care at selected Health Centers in Lideta Sub-city.

6.2 Specific Objectives

- To examine Knowledge of PHCP on Prediabetes.
- To study the attitude of PHCP towards Prediabetes practice.

7 METHODOLOGY

7.1 Study Area and Period

The research was done in five Health centers found in Lideta sub-city (Tekle- Haymanot, Jagema kelo, Dagim Hidase, Beletshachew health centers). The research was carried out between August 1 and October 30, 2023.



Figure 2: locational map of Lideta subcity

7.2 Study Design

Descriptive, Cross-sectional design was used to examine the Knowledge and Attitude towards Prediabetes practice of PHCPs at selected Health Centers in Lideta subcity Addis Ababa.

7.3 Source Population

All Primary Care Providers who work in selected Health centers at Lideta sub-city

7.4 Study Population

Primary Health care providers who were evaluating and treating adult medical patients (Medical Doctors, HOs, Bsc Nurses, residents) at outpatient clinic during period of data collection from August 1 to October 30, 2023. .

7.5 Inclusion and Exclusion Criteria

7.5.1 Inclusion criteria

- Health professionals (Medical Doctors, Bsc Nurses, Health officers) who were working in adult Medical clinics of the selected health centers in Lideta Subcity Addis Ababa
- Health professionals who were willing and consented to participate in the assessment

7.5.2 Exclusion criteria

- Health professionals who were not willing and did not consent to participate in the assessment
- Health professionals who practice at a unit other than adult medical clinics.

7.6 Sample Size Determination

Sample size for KAP survey on Primary care health professionals was based on a 2019 Study of KAP in 189 Primary health care Providers in Sudan Regarding Prediabetes with a Population size 200 and assumptions of a 95% confidence interval and 5% margin error. (15)

Then the sample size is estimated by using a formula

- Population Size = 172 health professionals from five health centers in Addis Ababa.
- Confidence level = 95%
- Margin of error = 5%

By using the above assumptions, the required sample size will be calculated as;

$$n = (Z^2 * P * (1-P)) / E^2$$

$$n = (1.96^2 * 0.5 * 0.5) / (0.05^2)$$

$$n = 120 + (10\% \text{ non-response rate}) = 132$$

7.7 Sampling Procedure

Using a simple random selection method, Lideta Subcity was chosen from 11 subcities in Addis Ababa. Then, simple random selection method was used again to select five health centers were from a total of eight health centers located in Lideta sub-city. The Lideta sub-city Health Department Office provided the defined list of primary care providers employed at adult medical clinics (General Medical Outpatient clinics, ART clinics, TB, Chronic Care Clinics, and Emergency Service). Lastly, using purposive sampling, 132 primary care professionals (General practitioners, internal medicine and family medicine residents, nurses, and health officers) who were present at Health Centers on the survey days were contacted and asked for permission to participate and complete the questionnaire forms.

7.8 Study Variables and Operational Definitions

7.8.1 Dependent variable

- Level of knowledge of pre-Diabetes screening and management

- Attitude and Practice levels of PCPs

7.8.2 Independent variable

- Level of education of the Health Professionals
- Years of experience in the field
- Level of Health facility(Primary Vs General and tertiary)

7.8.3 Operational Definitions

Knowledge: is the capacity to identify correctly prediabetes and diabetes related theoretical questions. According to Bloom's cut-off point, its scored as "good" if the score was 80-100%, "moderate" if the score was 60-79%, and "poor" if the score was < 60% (21)

Attitude: the perceived thinking towards prediabetes screening and management was categorized, as positive if the score was between 50-100%, negative if the score was between 0-50percent (21).

Practice: PHCP level of application of the right tests and methods for prediabetes screening and management. It is categorized, as "good" if the score was 50-100% and "bad" if the score was < 50% (21).

Primary Health care providers: are physicians (Medical Doctors), Nurse, Health Officers (22).

Prediabetes screening: is the process of testing high risk individuals for T2DM. This includes measuring blood glucose levels, assessing risk factors, and conducting patient history and physical examination.

The American Diabetes Association (ADA), criteria

- IGT (140-200 mg/dL)
- IFG (100-125 mg/dL)

- hemoglobin A1c (HbA1c) of 5.7% to 6.4% for the definition of prediabetes (23)

Health centers: Refers to primary healthcare facilities established by the Ethiopian government to provide basic healthcare services to the community. Health centers provide health promotion, prevention, and curative services, including T2DM screening.

7.9 Data Collection Procedure

Data was collected by 2 data collectors (A male Nurse and a male HO) using paper based structured self-administered questionnaires and online survey forms distributed via personal email and telegram groups. A questionnaire was adopted from USAs' National Survey of Primary care Physicians done in 2019. It has 4 sections including demographic characters, risk factors for Prediabetes, and Prediabetes management & Medication. After data was collected it was entered to IBM-SPSS version 26.

7.10 Data Quality and Management

With an orientation about the questionnaire and data collection techniques, data quality was tried to be accurate. Throughout the data collection process, I did supervision and follow-up.

7.11 Data Processing and Analysis

After collection, data were coded and entered into IBM SPSS version 26.

Descriptive measures were used to summarize categorical variables. Using multiple logistic regression analysis significance levels was tested.

Ordinal logistic regression analyses were used to analyze the strength of association of knowledge with independent variables. A P-value for multivariable analysis <0.05 was

used to express statistical significance. An adjusted odd ratio with 95% confidence interval was reported to measure association between variables. Finally, results were summarized and presented by using texts, and tables.

8 ETHICAL CONSIDERATIONS

Ethical approval was obtained from the ethical review committee of the Department of Family Medicine, Addis Ababa University Ref. No:_____ Date / /2015 EC. Furthermore, a letter of support was secured from Lideta Sub-city Administration Health department. After getting permission from the office, request letters were taken to respective locality Health Centers. Informed written consent was obtained from the study participants after explaining full information of the study. The study purpose, and other detail explanation of the study and participants writes was clearly explained for study participants by reading Amharic translated instruction sheet. For this purpose, a consent form was attached as a cover page of each questionnaire stating about the general objective of the study and issues of confidentiality which was discussed by the data collectors before proceeding with the data collection. Finally, strict care for the respondent's confidentiality was provided throughout the time of data collection.

9 RESULTS

9.1 Socio-demographic Characteristics

A total of 132 participants were involved in this study with a response rate of 100%.

Among the 132 study participants, 56 (42.4%) were male and 76(57.6%) were female.

According to their professions, 58(43.9%) , 28(21.2%), 20 (15.2%), 6 (4.5%), and 20 (15.2%) were Nurses, HO, Family Medicine residents, Internal Medicine residents and GPs, respectively.

Health facilities which study scores are collected, 33(25.0%), 21(15.9%), 16(12.1%), 21(15.9%) and 41(31.1%) were from Bletshachew, Lideta, Dagim Hidase, Jagema Kelo and Teklehaymanot Health Centers respectively.

Based on practice duration, 18(13.6%), 27(20.5%) and 87(65.9%) had > 10 years, 5-10 years and <5 years of work experience, respectively.

Table 1: Socio-demographic characteristics of participants		
Socio-demographic character	Variable category	n(%)
Sex	Male	56(42.4%)
	Female	76(57.6%)
Profession	Nurse	58(43.9%)
	HO(others)	28(21.2%)
	Family Medicine	20(15.2%)
	Internal Medicine	6(4.5%)
	GP	20(15.2%)
	Bletshachew	33(25.0%)
Health Facilities	Lideta	21(15.9%)
	Dagim Hidase	16(12.1%)
	Jagema Kelo	21(15.9%)
	Teklehaymanot	41(31.1%)
	>10 years	18(13.6%)
Work Experiences	5-10 years	27(20.5%)
	<5 years	87(65.9%)

9.2 Knowledge of Study Participants

Knowledge was categorized, using Bloom's cut-off point, as "good" if the score was between 80 and 100%, "satisfactory" if the score was between 60 and 79%, and "poor" if the score was less than 60% (18)

The study participants level of knowledge was evaluated using 11 knowledge questions and 55 (41.7%), 45(34.1%), 32(24.2%) of them had poor, satisfactory and good knowledge scores respectively (Table 2).

Table 2 : Knowledge scores of health professionals

		Health Profession					Total
		Nurse	HO(others)	Family Medicine	Internal Medicine	GP	
Poor	Number	33	17	2	1	2	55
	%	56.9%	60.7%	10.0%	16.7%	10.0%	41.7%
Satisfactory	Number	17	7	8	1	12	45
	%	29.3%	25.0%	40.0%	16.7%	60.0%	34.1%
Good	Number	8	4	10	4	6	32
	%	13.8%	14.3%	50.0%	66.7%	30.0%	24.2%
Total	Number	58	28	20	6	20	132
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In this study, the mean level of knowledge was 5.9 of which 55(%41.7) are below the mean and 77(58.3%) are above the mean.

9.3 Logistic Regression

The Odds of being in a higher knowledge category (satisfactory or good) for Nurses and Health Officers compared to GPs are 0.22 and 0.16 times smaller respectively compared to Odds of being in the lower knowledge category (poor) (CI:-2.306 - 0.253, P= 0.015, CI:-2.804 -0.457, P=0.006). This indicated that Nurses and Health Officers have low probability of being a higher category compared to lower Knowledge category.

Table 3: Knowledge Ordinary logistic regression of health professionals

					95% Confidence Interval	
		Estimate	Std. Error	Sig.	Lower Bound	Upper Bound
Threshold	[Knowledge = .00]	-1.877	.669	.005	-3.189	-.566
	[knowledge = 1.00]	.108	.641	.867	-1.149	1.364
Health	[Nurses=1.00]	-1.280	.524	.015	-2.306	-.253
Professionals	[HO=2.00]	-1.630	.599	.006	-2.804	-.457
	[Family Medicine =3.00]	.354	.771	.647	-1.158	1.866
	[Internal Medicine=4.00]	.776	1.051	.461	-1.285	2.836
Health	[GP=5.00]	0 ^a	.	.	.	.
Facilities	[Bletshachew =1.00]	-.307	.622	.622	-1.526	.913
	[Lideta =2.00]	.550	.681	.419	-.785	1.886
	[Dagim Hidase =3.00]	-.486	.729	.505	-1.915	.942
Work	[Jagama Kelo =4.00]	-.541	.686	.430	-1.885	.803
	[Teklehaymanot =5.00]	0 ^a	.	.	.	.
	Experience	[above 10 years=1.00]	-1.322	.595	.026	-2.489
[5 to10 years=2.00]		-1.496	.492	.002	-2.461	-.532
[below 5 years=3.00]		0 ^a	.	.	.	.

The Odds of being in a higher knowledge category (satisfactory or good) for those who have more than 10 years and between 5 to 10 years' experience compared to those who have less than 5 years' experience are 0.21 and 0.18 times smaller compared to Odds of being in the lower knowledge category (poor). ($P=0.026$, $P=0.002$) This indicated that there is low probability of being a higher knowledge category compared to being in lower knowledge category.

However the study showed no statistically significantly correlation between knowledge of Family medicine and Internal medicine different from the GP. In addition the difference of Health Centers did not show significantly associated to the knowledge of health professionals.

9.4 Participants Knowledge regarding Prediabetes Variables

The mean score of health professionals in identifying Prediabetes/Diabetes risk factor is 8.76. And 23 (47.7%) are below the mean and 69(52.3%) are above the mean in identifying pre diabetes risk factors.

Only 41(54%) of respondents had good knowledge of Diabetes risk factors by choosing more than 9 of the risk factors using Modified blooms cut off for knowledge. 6/12 of the risk factors were selected most by 16 respondents.

Corresponding to knowledge related to the lab criteria for the lower limits of Fasting glucose and Hemoglobin A1c for diagnosing diabetes, 89(67.4%) and 63(47.7%) of the respondents' knew the correct limits (126, 6.5%) but 43(32.6%) and 69(52.3%) didn't know the correct limits respectively.

Also 84(63.6%) and 66(50%) of the respondents' knew the correct limits of the upper and lower limits (range) of the lab criteria for diagnosing Prediabetes using Fasting glucose and Hemoglobin A1c (100-125mg/dl and 5.7-6.4%), but 48(36.4%) and 60(50%) didn't know the correct limits respectively. 82.5% and 56.5% recognized the fasting glucose and HbA1c cutoff indicative of Prediabetes, respectively.

Regarding the American Diabetes Association's (ADA) guidelines for patients with Prediabetes minimum weight loss (5–7% of body weight) and minimum physical activity (150 minutes), 83 (62.9%) and 70 (53%) of the respondents correctly answered the appropriate limits, but 49 (37.1%) and 62 (47%) choose incorrect options respectively.

Regarding their knowledge of the interval repeat lab testing needed to follow Prediabetes patients, 53(40.2%) of them knew the correct time interval, whereas 79 (59.8%) could not accurately identify the correct time frame of one year.

Comparably, 53(40.2%) knew the proper time interval for a patient appointment, whereas 79(59.8%) were unaware of the proper period (one year) for patient follow-up in the clinic.

When PCPs were questioned about their understanding of the indications under which they should give metformin to a patient with Prediabetes, 94 (71.2%) did not prescribe it, whereas 38 (28.8%) did so appropriately.

9.5 Attitude of Study Participants

Attitude was categorized, as positive if the score was between 50-100%, negative if the score was between 0-50 percent.

The mean attitude of research participants toward Prediabetes screening and care is 4 and 41 (31.1%) of them have a negative attitude, while 91 (68.9%) have a positive attitude.

Table 4: Attitude of health professions

			Health professions					Total
			Nurse	HO(others)	Family Medicine	Internal Medicine	GP	
Attitude	no	Count	25	13	1	1	1	41
		%	43.1%	46.4%	5.0%	16.7%	5.0%	31.1%
	yes	Count	33	15	19	5	19	91
		%	56.9%	53.6%	95.0%	83.3%	95.0%	68.9%
Total		Count	58	28	20	6	20	132
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Nurses and Health officers are 0.095 and 0.079 times less likely to have positive attitude respectively compared to GPs, toward pre-diabetes screening and care (AOR: 0.095, OR: 0.079, P=0.03, P=0.023 CI=0.11,0.8 CI=0.009,0.71).

Health professionals who have practice duration above 10 years and between 5 to 10 is 0.27 and 0.185 times less likely to have positive attitude towards Prediabetes screening and care respectively compared to those who have <5 years of practice (AOR: 0.27, OR: 0.185, P=0.026,P=0.001 CI=0.09,0.857, CI=0.067,0.511)

Table 5: Multiple logistic regression of Attitude

	B	S.E.	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
GP			.042			
[Nures=1.00]	-2.351	1.085	.030	.095	.011	.799
[HO=2.00]	-2.541	1.121	.023	.079	.009	.709
[Family Medicine =3.00]	-.089	1.477	.952	.915	.051	16.548
[Internal Medicine=4.00]	-1.335	1.553	.390	.263	.013	5.521
below 5 years			.002			
[above 10 years=1.00]	-1.293	.581	.026	.274	.088	.857
[5 to10 years=2.00]	-1.687	.518	.001	.185	.067	.511
Constant	3.359	1.059	.002	28.764		

9.6 Practice of Study Participants

Practice score was categorized, as “good” if the score was between 50 and 100%, and “bad” if the score will be less than 50%.

The mean practice score of Prediabetes screening and care was 1.7 and 105 (79.5%) had good pre-diabetes screening practices, whereas 27 (20.5%) had bad pre-diabetes screening practices in the health centers.

In response to initial management of Prediabetes patient, 122 Health professionals (92.4%) stated they would offer advice on changing one's diet and increasing physical

activity to help the patient lose weight, whereas 10 (7.6%) did not choose the correct option.

Concerning to individual health professions, Family Medicine and Internal medicine residents have good practice which is 100% but nurse have bad practice which is 22(37.9%)

Nurse professionals are 0.103 times less likely to have good practice in pre diabetes screening and care compared to GPS. (AOR: 0.103, P=0.036, CI=0.012, 0.862).

Health professionals who have practice duration of more than 10 years are 0.18 times less likely to have good practice in Prediabetes screening and care compared to those who have < 5 years' experience (AOR: 0.18, P=0.006 CI= 0.055,0.612) but, those who have work experiences between 5 and 10 years showed no significant difference .

Table 6: Practice of health professions

		Health Professions						
			Nurse	HO(others)	Family Medicine	Internal Medicine	GP	Total
Practice	no	Count	22	4	0	0	1	27
		%	37.9%	14.3%	0.0%	0.0%	5.0%	20.5%
	yes	Count	36	24	20	6	19	105
		%	62.1%	85.7%	100.0%	100.0%	95.0%	79.5%
Total		Count	58	28	20	6	20	132
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

9.7 Correlation between KAP Variables

Pearson Chi-Square at P=0.00 showed that the knowledge of health professionals is significantly different both with in health professional level and work experience and it has significant relationship with the place of health facilities where they are working (P=0.012) Table: 7

Table: 7 Knowledge correlation with place of work

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Chi-Square (Pearson)	19.624 ^a	8	.012
LR(likelihood ratio)	19.034	8	.015
Linear-by-Linear Association	6.016	1	.014
No of Valid Cases	132		

a. 1 cells (6.7%) have expected count less than 5. The minimum expected count is 3.88.

With Pearson Chi-Square both attitude and practice of health professionals is significantly associated with both health professional level and work experience ($p=0.00$), and to place of health facilities where they are working ($P=0.026$, $P=0.030$ respectively)

Table: 8

The Pearson Chi-Square of knowledge of health professionals in screening pre diabetes has significant relationship with their attitude and practice ($P=0.00$). Also their attitude has association with their practice in prescreening of pre diabetes.

Table: 8 Chi-Square Tests Attitude and Work experience

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	20.071 ^a	4	.000
Likelihood Ratio	21.567	4	.000

Linear-by-Linear	16.721	1	.000
Association			
N of Valid Cases	132		

a. 1 cells (11.1%) have expected count less than 5. The minimum expected count is 4.36.

10 DISCUSSION

Unlike a study in Sudan, where 60.8% of the participants had satisfactory knowledge about prediabetes only 24.2% of participants in the survey were found to have good understanding and 34.1% had satisfactory knowledge of Prediabetes screening and care, indicating knowledge gap in this area (15). There were 11 knowledge questions presented and the percentage of respondents who answered correctly (58.3%) and incorrectly (41.7%) were above and below the mean score of 5.8%. These results were not too far off to suggest that PCPs had good knowledge.

6/12 of the risk factors were selected most by 16 respondents which is poor as compared to 10/15 risk factors chosen in USA Johns Hopkins study. (20)

Comparable to results from a study in Sudan (2021) by Amel et al (which was 82.5% and 56.5%), 84(63.6%) and 66(50%) had correct response of the laboratory test cutoffs for FBS and HbA1c in Prediabetes screening (15). Additionally, there was a decrease in Prediabetes screening knowledge among professionals with >10 years and 5-10 years of practice compared to those with <5 years of experience ($P=0.026$, $P=0.002$), while research conducted in Sudan similarly revealed a substantial correlation (P value = 0.000) between knowledge score and experience duration (15).

In this study using Ordinal Logistic regression knowledge of Prediabetes screening and management had statistically significant association with the decreasing level of Primary care providers' education as seen with Nurses and Health Officers degree of association relative to General Practitioners (CI:-2.306 - 0.253, $P= 0.015$, CI:-2.804 -0.457, $P=0.006$) which had similar findings with study in Sudan with study also showed that increasing educational courses about diabetes and increasing clinical experience have positive impact in increasing knowledge about Prediabetes for primary care physicians (15).

The majority of individuals (68.95 %) had a positive attitude about Prediabetes. The mean score from the six attitude questions that were asked was 4. The degree of education of respondents was correlated with a lower likelihood of having a positive attitude toward Prediabetes screening and management ($P=0.03$, $P=0.023$ CI=0.11, 0.8

CI=0.009, 0.71). The results were 43.1% Nurses had negative attitude and 95% of Family medicine residents have positive attitude which indicates that level of attitude may be affected by the differences in level of Profession. Similar to a study in China, which concluded that overall attitude scores were inversely correlated with the participants' age and duration of practice, this study showed that Increased duration of practice also had negative effect on attitude of health professionals towards Prediabetes screening ($P=0.026, P=0.001$ CI=0.09,0.857 CI=0.067,0.511) for those >10 years and 5-10 years respectively due to the fact that younger PCPs are more likely to keep up-to-date with current trends in Prediabetes (19).

Consistent with a result from a study in Nigeria (91.6%), 92.4% of the Primary care providers stated they would offer advice on changing one's diet and increasing physical activity to help the patient lose weight which was even better than previous study which 76.2% management practice of Prediabetes (16).

Respondents did not have adequate information on availability of tests at their Health centers since tests not being done in Health centers as 42.4% 2hrOGTT and 55.3% HA1C were chosen as a method to screen for Prediabetes. Most (87.8%) respondents chose FBS as a screening tool followed by Non-fasting glucose with 37.9% when compared to previous study 47.1% choose FBS and 2.1% Non-fasting glucose as method of Prediabetes screening in Sudan (15).

Studies on KAP Prediabetes screening and care in Primary care providers is sparse in Ethiopia as well as most of Eastern Africa (Sudan being the only reference).

11 STRENGTHS AND LIMITATIONS

11.1 Strengths of the Study

The study included KAP of five distinct Health Profession levels which will aid in the findings made about the gaps that each type of profession possesses.

11.2 Limitations of the Study

The distribution of PCPs was not representative of two Professions (Internal Medicine, Family Medicine) due to their unavailability at most Health centers which might limit the generalizability of findings.

The study was limited to Health centers in Lideta subcity of Addis Ababa which can again affect generalizability of results.

12 CONCLUSION

Only 24.2% of primary care physicians had a good degree of knowledge about Prediabetes screening, indicating a limited knowledge base. I believe Primary health care Providers are unfamiliar with the topic's nature. Thus, it's crucial to keep PCPs informed about Prediabetes screening and management. The respondents' knowledge, attitudes, and practices vary depending on their professional title. KAP was found low in Nurses with which might imply more education on the matter is needed to Nurse Professionals. KAP scores rose with increasing professional level (title), but fell with increasing practice year. This suggests updating PCPs about Prediabetes screening and care is essential for the improved outcome of the disease.

Surprisingly, most PCPs had positive attitudes toward Prediabetes screening and its management. Therefore, it will take not much effort trying to improve knowledge of Prediabetes screening and care.

13 RECOMMENDATIONS

Filling this knowledge gap in Prediabetes screening and management in Lideta subcity health centers and Addis Ababa generally is the responsibility of several stakeholders.

- Support organizations that collaborate with the Lideta-subcity health office, such as MOH, AAU (Tikur Anbesa Specialized Hospital) must be able to offer assistance by providing supportive evaluation and feedback. The Lideta Subcity Health office must raise the Level of medical professionals, strengthen the level of laboratories testing menus, and provide adequate CPD trainings on NCD, especially DM.
- The Subcity or Addis Ababa Health Bureau must also be able to develop a platform for primary care practitioners to receive trainings.
- The Ministry of Health shall endeavor to raise public awareness of Prediabetes among all PCPs and the general public. Because Family Physicians and Internal Medicine specialists play such a significant role in primary care, the MOH must designate these medical professionals as primary care lead Physicians.

14 APPENDICES

14.1 Structured questionnaire

Survey of Pre-Diabetes Screening and Treatment Practices by Primary Care Physicians

We would like to ask for your help in a new study being conducted by **Dr Mikiyas Negatu Demessie** at the **AAU School of Medicine**. This study is part of an effort to learn how primary care providers for adults make clinical decisions about screening and treating Prediabetes.

This survey is confidential and your individual responses will not be identifiable. Your information will only be seen by researchers at AAU. There are no foreseeable risks or direct benefits associated with this research. Completion of this survey is entirely voluntary and will serve as your consent to take part in this research study. This study was approved by the Institutional Review Board of the AA University School of Medicine

We will provide you a summary of our findings and results after the completion of this study. As a thank you for your participation, you will receive a thank you paper when you turn in the survey.

Thank you very much for your participation in this important study!

Sincerely,

Are you willing to participate?

Yes_____ No_____

በአ.አ.ዩ ጥቁር አንበሳ ሆስፒታል የሕክምና ትምህርት ቤት በፋሚሊ ሜዲሲን ሬዘደንት ሐኪም ዶ/ር ሚኪያስ ንጋቱ ደምሴ
እየተካሄደ ባለው አዲስ ጥናት ላይ እርዳታዎን ልንጠይቅዎ እንፈልጋለን። ይህ ጥናት ለአዋቂዎች የመጀመሪያ ደረጃ እንክብካቤ አቅራቢዎች የቅድመ የስኳር በሽታን ለመመርመር እና ለማከም ከሊኒካዊ ውሳኔዎችን እንዴት እንደሚወስኑ ለማወቅ የሚደረግ ጥረት አካል ነው።

ይህ የዳሰሳ ጥናት ሚስጥራዊ ነው እና የግለሰብ ምላሾችም ሊታወቁ አይችሉም። የእርስዎ መረጃ በአ.አ.ዩ ተመራማሪዎች ብቻ ነው የሚታየው። ከዚህ ጥናት ጋር የተያያዙ ምንም ሊታዩ የሚችሉ አደጋዎች ወይም ቀጥተኛ ጥቅሞች የሉም። የዚህ የዳሰሳ ጥናት ማጠናቀቅ ሙሉ በሙሉ በፈቃደኝነት ነው እና በዚህ የምርምር ጥናት ውስጥ ለመሳተፍ እንደ ፈቃድዎ ያገለግላል። ይህ ጥናት አ.አ. ዩኒቨርሲቲ የሕክምና ትምህርት ቤት ተቋማዊ ግምገማ ቦርድ እና በአ.አ.ዩ የማህበረሰብ ሐኪሞች የምርምር እና ፕሮጀክቶች ኮሚቴ ጸድቋል።

ይህ ጥናት ከተጠናቀቀ በኋላ የኛን ግኝቶች እና ውጤቶቻችንን ማጠቃለያ እናቀርብልዎታለን። ለተሳትፎዎ ለማመስገን፣ የዳሰሳ ጥናቱን ሲገቡ የምስጋና የስጦታ ካርድ ያገኛሉ።

በዚህ ጠቃሚ ጥናት ላይ ስለተሳተፉ በጣም እናመሰግናለን!

በጥናቱ ላይ ለመሳተፍ ፍቃደኛ ነዎት

አዎ ነኝ _____ አይደለሁም _____

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Your completion of this survey will serve as your consent to be in this research study.

Part I. The following inquiries relate to diabetes screening techniques and knowledge.

Which risk factor from the list below makes you screen patients for diabetes? (Check EVERY that applies.)

- ☐ Body Mass Index $\geq 25 \text{ kg/m}^2$
- ☐ BP(>-140/90)
- ☐ Hypercholesterolemia
- ☐ Age ≥ 45
- ☐ Cardiovascular disease
- ☐ First-degree relative with history of diabetes
- ☐ Sedentary lifestyle
- ☐ History of gestational diabetes Mellitus
- ☐ Smoking history

1. In your practice, which test or tests do you order to screen for diabetes? More than one can apply

- ☐ Random blood glucose
- ☐ FBS
- ☐ Hg A1c
- ☐ 2-hour OGTT
- ☐ I don't do regular diabetes mellitus screenings for patients

2. What is the lower blood value for diagnosing **diabetes Mellitus**

a. FBS (mg/dL):

☐ Don't know

100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140

b. HA1c (%):

☐ Don't know

5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7.0

3. What are the upper and lower limits values to diagnose **prediabetes**.

a. **FBS (mg/dL):** ☐ Don't know

70, 75, 80, 85, 90, 95, **100**, 105, 110, 115, 120, **125**, 130, 135, 140, 145, 150, 155, 160,

b. **H A1c (%):** ☐ I Don't know

5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, **5.7**, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, **6.4**, 6.5, 6.6, 6.7, 6.8, 6.9, 7.0,

4. CHOOSE the corresponding value to lifestyle modification for patients with Prediabetes:

a. **Minimum weight loss (% of body weight):** ☐ I Don't know

1, 2, 3, **4**, **5**, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20,

b. **Minimum physical activity (minutes per week):** ☐ I Don't know

10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, **150**, 160, 170, 180, 190, 200,,

What level of agreement or disagreement do you have with the following statements?					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5. Diagnosing Prediabetes					
a. Useful for general health	☐	☐	☐	☐	☐
b. Helps to treat hypertension properly	☐	☐	☐	☐	☐
c. Helps to treat hyperglycemia	☐	☐	☐	☐	☐
6. PrediabeticS develop T2DM quickly than healthy people	☐	☐	☐	☐	☐
7. Lifestyle modification HELPS TO reduce the risk of T2DM	☐	☐	☐	☐	☐

Part II. questions of Prediabetes management/CARE

8. Select the **recommended initial** management for Prediabetes?

- ☐ diet changes and weight loss counseling
☐ Other _____

9. what is the **initial** management for prediabetes? (more than one can apply)

- ☐ It does not requires specific management
- ☐ counseling on diet changes and weight loss
- ☐ Other _____

10. Choose timing of Prediabetes, repeat lab work

- ☐ 3 /12
- ☐ 6 /12
- ☐ 1year
- ☐ 2 years

11. In Prediabetes, when, is patient follow up?

- ☐ 3 /12
- ☐ 6 /12
- ☐ 1 year
- ☐ 2 years

12. To what extent do you agree or disagree that the following prevent your prediabetic patients from changing their lifestyles?	I Strongly Disagree	I Disagree	I'm Neutral	I Agree	I Strongly Agree
a. poor motivation	☐	☐	☐	☐	☐
b. physical restriction	☐	☐	☐	☐	☐
c. Lack of physical exercise tool	☐	☐	☐	☐	☐
d. Lack of diet knowledge of patient	☐	☐	☐	☐	☐
e. Patients don't think it is important	☐	☐	☐	☐	☐
f. Lack of money	☐	☐	☐	☐	☐

13. To what extent do you think the following measures will enhance the control and treatment of prediabetes??	I Strongly Disagree	I Disagree	I'm Neutral	I Agree	I Strongly Agree
a. Adequate time to educate	☐	☐	☐	☐	☐
b. teaching materials for patients	☐	☐	☐	☐	☐
c. Improved nutrition education	☐	☐	☐	☐	☐
d. Enrolment in physical activity program	☐	☐	☐	☐	☐

Part III. Questions of Prediabetes medication management.

14. Which are indications of Metformin for Prediabetes?

- ☐ I never prescribe MTF for Prediabetes
- ☐ Body Mass Index $\geq 35 \text{ kg/m}^2$
- ☐ Familial T2DM
- ☐ hypercholesterolemia
- ☐ SBP $>140/90$
- ☐ History GDM
- ☐ H A1c $> 6\%$
- ☐ CVD
- ☐ < 60 YEARS OLD
- ☐ ≥ 60 years old
- ☐ POOR response to lifestyle MODIFICATION

Part IV. Demographic information

15. What is your specialty? (Select ALL that apply)

- ☐ Nurse Professional
- ☐ Health Officer
- ☐ Family Medicine resident
- ☐ Internal Medicine resident

16. How long since you graduated from residency or undergraduate training?

- ☐ <5 years
- ☐ 5-10 years
- ☐ 10+ years

17. On average, how many clinic sessions do you have per week?

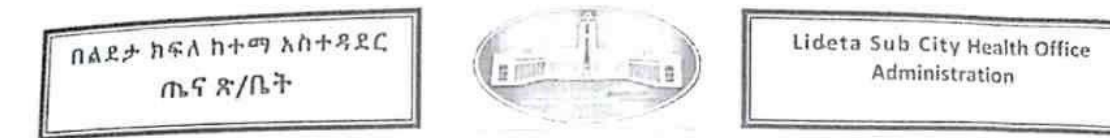
- ☐ 1-2
- ☐ 3-4
- ☐ 5-6

18. What is your primary practice site? (e.g., Chronic OPD, Emergency)

19. What is your gender?

- ☐ Female
- ☐ Male

14.2 Letter of Support from Lideta Sub City Health Office Administration



ቀን 08/12/15
Date:-

ቁጥር ል/ክ/ከ/ጤ/ፅ/ቤት-2016/12/15
Ref.NO:-

- ✓ ለተ/ሃይማኖት ጤና ጣቢያ
- ✓ አብነት ጤና ጣቢያ
- ✓ ለተ/ሃይማኖት ጤና ጣቢያ
- ✓ ለወ/ሮ በለጥሻቸው ጤና ጣቢያ
- ✓ አብነት ጤና ጣቢያ
- ✓ ልደታ ጤና ጣቢያ
- ✓ ጀነራል ጃጋማ ኬሎ ጤና ጣቢያ
- ✓ ለወረዳ 4 ጤና ጣቢያ

ልደታ ክ/ከተማ

ጉዳዩ :- ለጥናት ጽሁፍ የመረጃ ትብብር እንዲደረግልቸው ስለመጠየቅ

የአዲስ አበባ ጤና ቢሮ በቀን 05/12/2015 ዓ.ም በቁጥር MF/PG 105/2023 በተጻፈው ደብዳቤ መሰረት ለዶ/ር ሚካኤል ንጋቱ በ "KNOWLEDGE OF TYPE 2 DIABETES MELLITUS SCREENING AND DETERMINANTS AMONG HEALTH PROFESSIONALS IN ADDIS ABABA HEALTH CENTER." በሚል ርዕስ ላይ ጥናት ማድረግ ስለፈለጉ በእናንተ ተቋም ላይ ምርምር እንዲያደርጉ የተፈቀደላቸው ስለሆነ በእናንተ በኩል እፈላጊውን ትብብር እንድታደርጉላቸው እናሳስባለን ::

ከሰላምታ ጋር

ሰ/ር አልማዝ ወልዱ

የሚዲካል ስርቪስ ባለሙያ



ግልባጭ

- ለሚዲካል አገልግሎት ቡድን
- ለፋይል
- ለዶ/ር ሚካኤል ንጋቱ



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2022/1000

15 BIBLIOGRAPHY

1. IDF. [Online] <https://idf.org/our-network/regions-and-members/africa/members/ethiopia/https://idf.org/our-network/regions-and-members/africa/members/ethiopia/>.
2. *Prevalence of Diabetes Mellitus, Prediabetes and Its Associated Factors in Dessie Town, Northeast Ethiopia: A Community-Based Study*. **Endris T, Worede A, Asmelash D.** Desessie : Dove Press, 2019, Vol. 12.
3. WHO. *WHO.int*. [Online] 4 5, 2023.
4. *Prevalence and risk factors of type-2 diabetes mellitus in Ethiopia: systematic review and meta-analysis*. **Melkamu A Zeru, Endalamaw Tesfa, Aweke A Mitiku, Awoke Seyoum, Tesfaye Abera Bokoro** . s.l. : PubMed NCBI, 2021.
5. *Undiagnosed Diabetes Mellitus and its predictors among socially marginalized Menja communities in Southwest Ethiopia*. **Ashenafi Assefa, Nigusie Shifera**. [ed.] Åke Sjöholm. Mizan Tepi : Frontiers in public health, May 12, 2022, Vol. 10, p. 8. 861627.
6. *Survey of Primary Care Physicians' Screening and Treatment Practices for Prediabetes in Saudi Arabia*. **Faisal Aljehani,corresponding authorAbdullah Alsulaiman, Abdulrahim Alqarni, Fahad Almutairi, May Samkari**. 1, Saudi Arabia : Cureus , 2022, Vol. 14.
7. IDF Diabetes Atlas. [Online] <https://diabetesatlas.org>.
8. *Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition*. **Pouya Saeedi**. 2019.
9. *Knowledge, attitude, and practice toward pre-diabetes among the public, patients with pre-diabetes and healthcare professionals: a systematic review* . **Kah Woon Teoh**. 2022.
10. *prediabetes deserves more attention: A review* . **Yakubu Lawal**. s.l. : PMC, 2020.
11. *The four domains of chronic disease prevention* . s.l. : CDC, 2019.
12. *Applying the Theory of Planned Behavior to predict community pharmacists' intention to provide diabetes care*. **Dalia EL-Kaffash,corresponding author1 Ebtisam Fetohy,2 and Azza Mehanna2**. Alexandria : BMC Health , 2022, Vol. 22.
13. *National Survey of Primary Care Physicians' Knowledge,.* **Eva Tseng,MD1,2**. Baltimore : © Society of General Internal Medicine, 2019.
14. *Prediabetes awareness among different specialities of physicians:.* **Mohsina Hyder K, Viswanathan Balasubramaniam, Rajanandh MG, Sivasankaran Ponnusankar**. 9, India : Journal of Applied Pharmaceuticals , 2022, Vol. 12.

15. *Knowledge, Attitudes and Practice Among Primary Care Physicians in.* **Amel Mohamed.** Khartoum, : ijpvmjournal, 2021.
16. https://www.researchgate.net/publication/349994307_Assessing_The_Knowledge_Attitude_And_Practice_KAP_of_Prediabetes_Management_Among_Healthcare_Providers_in_Four_Tertiary_Hospitals_In_Nigeria_An_Observational-Based_Cross-Sectional_Study.
17. *The magnitude of undiagnosed diabetes mellitus, prediabetes, and associated factors among adults living in Debre Tabor town, northcentral Ethiopia: A community-based cross-sectional study.* **Shewaneh Damtie, Lemma Workineh, Ayenew Berhan, Tegenaw Tiruneh, Biruk Legese, Birhanu Getie, Teklehaimanot Kiros, Tahir Eyayu.** 7, Debre Tabor : Heliyon , 2023, Vol. 9.
18. *Magnitude and predictors of pre-diabetes among adults in health facilities of Gondar city, Ethiopia: a cross-sectional study.* . **Tsigereida Andargie** . Gondar : s.n., 2021, Vol. 11.
19. *Primary care providers knowledge, attitude and practices related to Prediabetes in China.* **Linhua Pi.** Yunnan : frontiers , 2023.
20. *National Survey of Primary Care Physicians' Knowledge, Practices, and Perceptions of Prediabetes.* **Eva Tseng MD, Raquel C. Greer MD, Paul O'Rourke MD, Hsin-Chieh Yeh PhD, Maura M. McGuire MD, Ann L. Albright PhD, Jill A. Marsteller PhD, Jeanne M. Clark MD & Nisa M. Maruthur MD.** USA : Springer Link, 2019, Vol. 34.
21. *Knowledge, attitude and practice the three pillars of excellence and wisdom: a place in the medical profession.* **Badran, Ibrahim G.** s.l. : Eastern Mediterranean Health Journal, 1995.
22. *The Impact of Primary Care: A Focused Review.* **Shi, Leiyu.** Cairo : Scientifica (Cairo), 2012, Vol. v.2012; 2012 .
23. *Prediabetes diagnosis and treatment: A review.* **Bansal, Nidhi.** 2015.
24. *Undiagnosed diabetes.* **Getachew Yideg Yitbarek, Gashaw Walle Ayehu, Sintayehu Asnakew, Ermias Sisay Chanie, Wubet Alebachew Bayih, Dejen Getaneh Feleke, Tadege Jemere Amare, Fentaw Teshome, Assefa Agegnehu Teshome, Getachew Arage, Fanos Yeshanew Ayele, Alemayehu Digssie Gebremar.** 2021, Nature portfolio scientific reports, p. 10.
25. *IDF diabetes Atlas: Global estimates of undiagnosed diabetes in adults for 2021.* **Katherine Ogurtsova a, Leonor Guariguata b, Noël C. Barengo c, Paz Lopez-Doriga Ruiz d i, Julian W. Sacre e, Suvi Karuranga f, Hong Sun g, Edward J. Boyko g, Dianna J. Magliano e h.** 2022, Vol. 183.
26. International Diabetes Federation . [Online] Optima, November 02, 2021. <https://idf.org/news/diabetes-now-affects-one-in-10-adults-worldwide/>.

27. *Forecasting future prevalence of type 2 diabetes mellitus in Syria*. **Radwan Al Ali, Fawaz Mzayek, Samer Rastam, Fouad M Fouad, Martin O’Flaherty, Simon Capewell & Wasim Maziak**. Syria : BMC Public Health , 2013, Vol. 13.
28. *Predictors of prediabetes/diabetes and hypertension*. **Tom Norris, Meron Girma, Tirsit Genye, Alemayehu Hussen**. s.l. : Wiley, 2022.
29. Macrotrends . [Online] 10 14, 2023.
<https://www.macrotrends.net/countries/ETH/ethiopia/fertility-rate>.
30. *Findings of a Study Exploring Homeless Street Females in Addis Ababa, Ethiopia: A Need*. **Beverly Edwards**. Addis Ababa : s.n., 2015.
31. *Global Prevalence of Prediabetes* . **Mary R. Rooney**. 2023.
32. **R Paul Robertson, MD**. *Type 2 diabetes mellitus: Prevalence and risk factors*. 2023.
33. *Operational definition*. **Bekele Taye Feleke**. 2021.