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Knowledge, attitude, and practice towards diabetes mellitus among Chiro town population, Eastern Ethiopia

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Abstract

Background Diabetes mellitus is a metabolic disorder with multiple etiological factors characterized by chronic hyperglycemia and disturbance of carbohydrate metabolism. It can play a vital role in the cause of morbidity and mortality through continued clinical consequences and mortality. Therefore, good knowledge of diabetes mellitus prevention and management is necessary for promoting care and enhancing good therapeutic outcomes.

Objective To assess the knowledge, attitude, practice among the general population regarding diabetes mellitus in Chiro town, Eastern Ethiopia, from August 01 to October 30, 2023.

Methods A cross-sectional study was conducted on 764 subjects. A pre-tested structured questionnaire was used to collect the socio-demographic information of the study participants. Data was entered into the Statistical Package for Social Science, checked for completeness and analyzed. The characteristics of the study population were summarized using descriptive statistics, frequency and percentage.

Result The study revealed that 98% of respondents had heard of diabetes, with 80% identifying it as a condition of high blood sugar and 25% recognizing inadequate insulin action as a characteristic. Additionally, 65.57% demonstrated good knowledge of diabetes, 60% had a positive attitude towards diabetes management, and 35.4% reported good practices. Despite these insights, misconceptions persisted, such as 25% believing diabetes is caused by a curse. Regular exercise and non-smoking were common positive practices, but only 10.4% regularly checked their blood sugar levels.

Conclusion and recommendation This study highlights high diabetes awareness (98%) but incomplete understanding. Mixed perceptions about diabetes management and significant gaps in prevention practices emphasize the need for targeted educational programs. These programs should focus on improving understanding of diabetes treatability, promoting regular monitoring, and encouraging healthier lifestyle choices. Enhanced awareness of comprehensive diabetes care, including proper medication use and physical activity, is essential for better prevention and management.

Keywords Attitude, Diabetes mellitus, Knowledge, Practice

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Introduction

Diabetes mellitus (DM) is a metabolic disorder of multiple etiological factors characterized by chronic hyperglycemia with disturbance of carbohydrate metabolism, which results from either insufficient insulin secretion, resistance to the action of insulin, or both [4]. The two

major types of DM are Type 1 Diabetes Mellitus (T1DM) and Type 2 Diabetes Mellitus (T2DM), responsible for 90% of the disease's prevalence [12]. T1DM is characterized by autoimmune destruction of beta cells, which leads to absolute insulin deficiency and dependence on insulin injections for survival [11]. T2DM is the most common form of DM, identified via hyperglycemia, insulin resistance, and relative insulin deficiency [1]. It can be controlled through a healthy diet, physical activity, losing excess weight, and oral medication [14].

Gestational DM occurs only during pregnancy and is a risk factor for T2DM after pregnancy [13]. The above types are by far the most frequent forms, but other specific types exist that are much less common [22].

Most persons with diabetes in developing countries are between 45 and 64 years of age, which is a significant segment of the productive age range. In addition to this reduced productivity and declining economic growth, the disease leads to a high economic burden in terms of healthcare expenditure [8].

In 2021, an estimated 537 million adults aged 20–79 were living with diabetes worldwide. This number is projected to increase significantly, reaching 643 million by 2030 and 783 million by 2045, nearly doubling the current global diabetic population. Over 3 in 4 adults with diabetes live in low- and middle-income countries [3, 21]. This indicates diabetes mellitus is a major and growing public health problem.

The African region is expected to experience the highest increase in coming years, with an estimated increase in prevalence rates of 98% for Sub-Saharan Africa. According to the International Diabetes Federation (IDF), the 2017 report in Ethiopia states that there are 2.6 million DM cases in the country.

Ethiopia, as one of the developing countries, has been showing changes that shift the lifestyle of the people towards urbanization, dietary changes, and reduced physical activity, particularly in recent decades. These rapid changes have led to the emergence of non-communicable diseases (NCDs) such as diabetes mellitus [5]. Which can play a vital role in the cause of morbidity and mortality through continued clinical consequences. This can play a vital role in the cause of morbidity and mortality through continued clinical consequences. People living with diabetes may have to deal with short-term or long-term complications as a result of their condition [19].

Effective approaches are available to prevent these complications and premature deaths that can result from all types of diabetes [10]. knowledge and practice across whole populations and within specific settings (school, home, workplace) that contribute to good health for everyone, regardless of whether they have diabetes, such as exercising regularly, eating healthily, avoiding smoking, and controlling blood pressure [18, 23]. In addition, information about diabetes mellitus can help people assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their disease for their lifetime [15].

80% of all diabetes cases will occur in the low and middle socioeconomic classes where knowledge about diabetes is poor [10]. Studies regarding the knowledge, attitude and practice towards DM have been conducted in some parts of Ethiopia. KAP regarding diabetes is the principal marker of awareness, which varies greatly depending on socioeconomic conditions, cultural beliefs and habits which need to be studied in various population groups in specific racial and cultural contexts [9]. As a result, to the knowledge of the researchers, no study was conducted in eastern Ethiopia in general and Chiro Town in particular. Therefore this study aims to assess the KAP towards diabetes mellitus in the Chiro town population, eastern Ethiopia.

Methodology

Study area and period

The study was conducted in Chiro Town, located in the West Hararghe Zone of Eastern Ethiopia, approximately 314 km east of Addis Ababa. Its elevation is 1,825 meters above sea level. According to the 2022 Ethiopian census report, there are about 69,793 people in the town, among these populations, 37,204 males and 32,589 females [7], and an average temperature of 27 °C. The town is a semi-urban area experiencing rapid urbanization, which has resulted in significant lifestyle changes, such as unhealthy dietary habits and reduced physical activity, contributing to an increased risk of diabetes among its population. Currently, it has one zonal hospital and two health centers.

The study was conducted from August 01 to October 30, 2023.

Study design

A cross-sectional study was conducted.

Source population

All people who live in Chiro town.

Study population

Those who fulfil the inclusion criteria.

Eligibility criteria

Inclusion criteria

Adults aged 18 years and above who are residents of Chiro Town and voluntarily agreed to participate in the study. Individuals who provided informed consent (either

written or through a fingerprint for illiterate participants) were capable of understanding the study's objectives.

Exclusion criteria

Individuals who refused to participate or were unable to provide informed consent. Participants who were seriously ill or incapacitated during the study period and unable to respond to the questionnaire. Individuals who had difficulty communicating due to impairments such as the inability to speak, hear, or comprehend the survey questions effectively.

Variables

Knowledge, attitude, and practice towards DM, Age, sex, religion, place of residence, marital status, educational status, occupational status, family income, and family history of DM.

Operational definition

Knowledge

It is the awareness of the community about diabetes mellitus. It is measured by calculating the mean score of the 11 items and categorized as knowledgeable (if participants scored ≥ mean score of the correctly answered questions) or not knowledgeable (if participants scored <mean score of the correctly answered questions).

Attitude

The way a community thinks and behaves toward DM. It is measured by 10 questions with a five-point Likert scale. All individual answers to attitudinal questions were computed to obtain total scores; then, the mean score was calculated to categorize as having positive attitude (if participants scored ≥ mean score) or negative attitude (if Participants scored < mean score).

Practice

The habitual community involvement to prevent DM. It is measured by 11 questions with options like "Yes" or "No," and for specific topics (every day, once a week, twice a week, and sometimes). All individual answers to practice questions were computed to obtain total mean scores and categorized as good practice (if participants scored ≥ mean score) or poor practice (if participants scored < mean score).

Sample size determination and sampling technique

Sample size determination

The sample size was determined using the single population proportion formula. By considering the p-value, 65.41% prevalence of knowledge about DM, which is obtained from a previous study, conducted in the Debre Marcos population [20], with 95% CI and margin of error (d) = 5%. After adding of 10% none response rate and multiplying by design effect the final sample size was 382 * 2 = 764.

KAP questioner development and data collection procedure

An official letter of support was written by the Oda Bultum University Research and Community Service Vice President's office. Permission to conduct the study was sought from the Chiro town administration. The questionnaire consisted of four parts, developed based on various literature sources. The first part covered demographic information, including sex, age, monthly income, ethnicity, educational status, marital status, religion, and occupation. The second part assessed general knowledge about diabetes, addressing topics such as the definition of diabetes mellitus (DM), its risk factors, symptoms, and complications. Respondents answered these questions using options: "Yes," "No," or "Not sure." Followed by correct and incorrect responses to further evaluate the responses, one point was offered for each correct response and the total mean score was calculated. The third part evaluated the respondents' attitudes toward DM using a five-point Likert scale (5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree). The final section focused on community practices related to DM prevention, including self-care, dietary modifications, and blood sugar monitoring. Respondents answered practice-related questions with options like "Yes" or "No," and for specific topics such as the frequency of physical exercise (e.g., every day, once a week, twice a week, sometimes), attempts to reduce or maintain weight (e.g., every day, usually, sometimes), and alcohol consumption (e.g., frequently, weekly, monthly, for holidays only). The questionnaire underwent a rigorous validation process to ensure content validity and reliability. Initially, it was reviewed by experts in public health and diabetes management for clarity, relevance, and appropriateness. Two trained local Public health experts, who were familiar with the community, approached participants through a door-to-door survey method at their homes, explained the purpose of the study, and obtained informed consent before conducting the study. The data was collected through face-to-face interviews, ensuring standardization across responses and allowing participants to seek clarification when needed. Participants were assessed for literacy before the survey; those who were literate completed the questionnaire independently, while illiterate participants were assisted by trained data collectors who read the questions aloud and recorded the responses on their behalf.

Data analysis and interpretation

Data was checked for completeness and entered into SPSS version 20 for analysis. Data was entered into EPI Info version 7 checked for completeness and transferred to SPSS (23) for analysis. The characteristics of the study population were summarized using descriptive statistics, frequency and percentage.

Data quality control

The questionnaire was pre-tested on 5% of the study population in the Hirna town community before the actual study began to assess the comprehensibility and cultural appropriateness of the questions, leading to revisions for better clarity, simplification, and alignment with local practices. The collected data was checked daily for consistency and accuracy. The final version of the questionnaire was then tested for reliability, with acceptable internal consistency confirmed through a Cronbach's alpha coefficient of 0.7 or above. The questionnaires were randomly selected for quality control purposes and rechecked. Data collectors were trained and the investigators also followed up the data collection process. Participants participated only once and also double data entry was checked using Epi-Data.

Results

Socio-demographic characteristics

The study revealed that a greater portion of the participants were male, comprising 53% of the total sample. The majority of participants fell within the age range of 18 to 78 years (mean 34.26 years, Standard deviation (SD) ± 9.35 years). Most of the participants, 267 (35.4%) were between the ages of 25 to 34 years. A significant portion of the respondents reported a monthly income of less than 5000 Birr, accounting for 62.8% of the sample population. Furthermore, the predominant ethnicity among the participants was Oromo, with 54.3% of respondents identifying as such. In terms of education, the majority of participants had completed either elementary or high school, constituting 64% of the sample. Additionally, a notable portion of the respondents were single (18.1%) and identified as Muslim (51.7%). Regarding occupation, self-employment was the most common, with 12.2% of respondents engaged in this type of work. Other prevalent occupations included farming (4.5%) and unemployment (24%) (Table 1).

Table 1 Socio-demographic characteristics of participants

Variables	Category	Frequency	Percent (%)
Sex	Male	443	53%
	Female	359	47%
Age	18–24 years	112	14.6
	25- 34 years	267	35.4
	35–44 years	171	22.4
	45–54 years	122	16
	> 55 years	66	8.6
Monthly income	< 5000	478	62.8
	5000	286	37.2
Ethnicity	Oromo	415	54.3
	Amhara	301	39.5
	Others	48	6.2
Educational status	Illiterate	66	8.6
	Elementary/High school	488	64
	College/university	210	27.4
Marital status	Single	138	18.1
	Married	484	57.7
	Divorced/Widowed	142	18.5
Religion	Orthodox	297	39
	Muslim	395	51.7
	Protestant	65	8.5
	Others	7	0.9
Occupation	Self employed	93	12.2
	Farmer	34	4.5
	Unemployed	183	24
	Employed (gov't/privet)	454	59.4

Knowledge towards DM

In this study, most respondents (98%) had heard of diabetes. When it comes to understanding diabetes, 80% of respondents identified it as a condition of high blood sugar, and 25% of respondents recognized inadequate insulin action as a key feature. Similarly, 71% classified diabetes as a non-communicable disease. Additionally, 92% identified that DM is related to one's lifestyle, 83% stated that DM is a chronic disease, 46% confirmed that insulin is required for diabetic patients, and 42.3% recognized that there are several types of diabetes. Notably, 25% believe diabetes is a "curse." Furthermore, 37.5% identified excessive eating as a symptom, 43.5% recognized gangrene requiring surgical removal as a major complication, and 40% recognized obesity as a contributing factor (Table 2).

The total mean score for knowledge questions was 38.52 ± 0.5. Those participants who scored below the mean score were 264 (34.4%, which was considered not knowledgeable), and those ≥ the mean score were 500 (65.57%, which was regarded as knowledgeable).

Attitude towards DM

The study explored attitudes toward DM among participants, revealing diverse opinions. A significant portion (43%) strongly disagreed with the belief that DM is treatable, while 22% agreed and 13.5% strongly agreed.

Table 2 Knowledge of the participants towards DM

Knowledge towards DM		Frequency (%)
Heard of diabetes	Yes	749(98)
	No	15 (2)
DM is a condition of high blood sugar	Yes	611(80)
	No	153 (14)
	I am not sure	31(4)
DM is a condition of inadequate insulin action	Yes	191 (25)
	No	153(14)
	I am not sure	466(61)
DM is non-communicable disease	1. Yes	542 (71)
	2. No	155(20.3)
	3. I am not sure	67(8.7)
Insulin is required for diabetic patients	1 Yes	351 (46)
	2 No	260(34)
	3 I am not sure	153 (20)
There are several types of diabetes	Yes	323(42.3)
	1. No	306(40)
	2. I am not sure	135 (17.7)
DM is a long term (chronic) disease	1 Yes	634 (83)
	2 No	53(7)
	3 I am not sure	77(10)
DM is related to life style	1. Yes	703(92)
	2. No	61(8)
	3. I am not sure	
Risk factor for DM	1 Family History	222(29)
	Obesity	305(40)
	2 Decreased physical activity	46 (6)
	curse	191(25)
The Symptoms of diabetes	1. Excessive feeling of thirst	134 (17.5)
	2. Excessive urination	3. 107(14)
	Excessive eating	283(37.5)
	1. Unexplained Weight loss	78(10.2)
	2. Slow healing of cuts and wounds	116(15.3)
	3. Tiredness and weakness	42(5.5)
Know complications of diabetes	4. Eye problems	145(19)
	5. Kidney problems	122(16)
	6. Oral and dental complication	31(4)
	1. Loss of sensation in arm and leg	84 (11)
	2. Cardiovascular disease	42(5.5)
	1. Gangrene in limbs that require surgical removal	332 (43.5)
	2. Erectile dysfunction/loss of libido	8(1)

Regarding DM's impact on life expectancy, 74% strongly disagreed that it reduces life expectancy, while 8% agreed and 1.5% strongly agreed. For blood pressure control in DM, 32% strongly disagreed, 18% agreed, and 29.5% strongly agreed. Regular exercise was deemed crucial by 60% who strongly agreed, while 20% agreed. Smoking complications were acknowledged by 55% who strongly agreed and 19.5% agreed.

Medication discontinuation was strongly disagreed with by 62%, while 67.3% of respondents strongly disagreed with the statement that initiating insulin worsens diabetes mellitus. In addition, 43% strongly disagreed

with the idea that proper diabetes treatment reduces complications.

Furthermore, 65% of respondents strongly agreed that herbal medications were perceived as less complicated, while 5% strongly agreed on the necessity of controlling lipid and blood pressure levels (Table 3).

The participants had a mean practice level score of 36, with a standard deviation of ± 2.3. 40% (306 individuals) had scores below the mean, indicating a negative attitude, while 393 participants (60%) had scores at or above the mean, indicating a positive attitude.

Practice towards DM

The study also examined the practices related to DM among participants. In this study, a significant majority (78.8%) reported not smoking cigarettes. Regarding exercise, 19.3% practiced it regularly, with frequencies of every day (5.5%), once a week (2.6%), twice a week (9.4%), and sometimes (1.8%). Additionally, 27% of respondents actively tried to reduce or maintain their weight, with efforts being made every day (30%), usually (49%), or sometimes (21%).

Only 10.4% of participants regularly checked their blood sugar levels. A substantial portion (81%) included vegetables in their diet; however, Fruit consumption was lower, with only 30.4%. On the other hand, Alcohol consumption was reported by 36% of respondents, with drinking frequencies of frequent (10.2%), weekly (13.5%), monthly (6.7%), and for holidays only (5.6%). 8.6% of the participants also commonly included meat and fat in their diet (Table 4).

The mean score of the participant's practice level was 36.4 ± 2.1. Those participants who scored below the mean score were 494 (64.6% which was considered as a bad practice) and those ≥ the mean score were 270 (35.4 % which was considered as a good practice).

Discussion

In the present study, approximately 62.7% of study participants knew the definition of DM, with 24.3% having good knowledge about the risk factors of DM, 16.58% of participants identified the symptoms of DM, and 83.7% of participants identified the complications of DM. In contrast, our results were higher than those of a study conducted in Kenya (29%) and Oman (57%) on DM signs/symptoms. Similarly, our results were higher than a study conducted in Nigeria (19%) on risk factors [16], The higher levels of knowledge about DM in our study compared to Kenya, Oman, and Nigeria can be attributed to a combination of factors, including better healthcare and education systems, effective public health campaigns, greater access to information, and cultural and socioeconomic differences. Understanding these factors can help inform future public health strategies and interventions to improve DM awareness and knowledge in other regions.

Regarding the knowledge about the complications of DM, results in this study were also higher than a study conducted in Enugu state, southeast Nigeria (57.8%) [16]. The higher knowledge about DM complications in our study area compared to the 57.8% study can be attributed to factors such as better healthcare infrastructure, effective public health campaigns, greater access to information, and cultural and socioeconomic differences. These insights can help inform targeted public health strategies and interventions to improve awareness and management of DM complications in other regions.

The present study found that 27.8% and 35.4% of the participants had good diabetes-related attitudes and practices, respectively. These findings were higher than a study carried out in Vadodara, India, that revealed 23.54% in attitude questions and 12.8% in practice questions [17]. The higher levels of good attitude and practice

Table 3 Attitude level of participants towards DM

Attitude towards DM	Strongly disagree	Disagree	Neutral		Agree	Strongly agree
DM Is treatable	329(43)	160(21)	4(0.5)		168(22)	103(13.5)
DM reduces life expectancy	565(74)	119(15.5)	8(1)	61(8)		12(1.5)
Blood pressure controlling is necessary in DM	244(32)	96(12.5)	61(8)	138(18)		225(29.5)
Regular exercise controls DM	30(3.9)	54(7.1)	69(9)		153(20)	458(60)
Smoking increase complication of DM	19(2.5)	92(12)	84(11)	149(19.5)		420(55)
Medication can be discontinued	65(8.5)	84(11)	30(4)	111(14.5)		474(62)
Initiating insulin exacerbates diabetes and its complications.	514(67.3)	158(20.7)	16(2)	32(4.2)		44(5.8)
Proper diabetes treatment could reduce the risk of other complications	329(43)	78(10.2)	131(17.1)	160(21)		66(8.7)
Herbal medications have less complication than modern medications	38(5)	19(2.5)	57(7.5)	153(20)		497(65)
Lipid and blood pressure control is necessary in diabetic patients.	420(55)	149(19.5)	42(5.5)	99(13)		54(7)

Table 4 Practice level of respondents towards DM

Practice towards DM		Frequency (%)
Smoke cigarettes	Yes	161(21.2)
	No	602(78.8)
Practice exercise	Yes	148(19.3)
	No	616(80.7)
If yes on question, how often	Every day	42(5.5)
	Once a week	20(2.6)
	Twice a week	72(9.4)
	Sometimes	14(1.8)
Trying to reduce or maintain weight	1. Yes	206(27)
	2. No	558(73)
If yes	Every day	62(30)
	Usually	101(49)
	Sometimes	43(21)
Check blood sugar regularly	Yes	80(10.4)
	No	684(84.6)
Includes vegetables in their diet	1 Yes	619(81)
	2 No	145(19)
Includes fruits in their diet	1 Yes	232(30.4)
	2 No	532(69.6)
Drink alcohol	Yes	275(36)
	No	489(64)
If yes	Frequently	78(10.2)
	Weekly	103(13.5)
	Monthly	51(6.7)
	For holidays only	43(5.6)
Commonly include meat and fat in their diet	Yes	66(8.6)
	No	698(91.4)

in our study suggest that existing educational and health programs are effective and should be continued and potentially replicated in areas with lower levels. Tailoring educational content to address specific gaps in attitudes and practices can further improve outcomes. Policymakers should use these findings to support the development of initiatives aimed at improving attitudes and practices towards diabetes management in areas with lower levels. Strengthening healthcare infrastructure and provider training can help improve patient attitudes and practices. Future research should explore the specific factors contributing to higher levels of good attitudes and practices in your study area, such as the role of healthcare providers, public health initiatives, and community engagement. Identifying successful strategies from our region and adapting them for use in other areas with lower levels of good attitudes and practices can enhance diabetes management efforts.

These findings were lower than those studies from Ethiopia and India with scores of 55.07% having a favorable attitude towards DM [2], attitude towards diabetes is 71.6%. The study conducted in India showed that the diabetic patient's practice is 69.6% [6]. The differences in findings could be due to variations in healthcare infrastructure and accessibility. Ethiopia and India have more comprehensive diabetes education programs and better healthcare support systems, leading to higher levels of favorable attitudes and practices. Robust public health campaigns in these regions effectively promote positive attitudes towards diabetes through community-based education and media. Cultural emphasis on proactive health management and community support, along with higher literacy rates and better access to healthcare resources, also contribute to the higher scores observed in these countries. Your study area may lack such extensive campaigns and support systems, resulting in lower levels of favorable attitudes and practices.

Conclusion

This study highlights high diabetes awareness (98%) among the participants, but significant gaps in understanding and misconceptions persist. While 80%

identified diabetes as high blood sugar, only 25% recognized inadequate insulin action as a key feature. Misbeliefs, such as attributing diabetes to a "curse," were reported by 25% of respondents. Mixed perceptions about diabetes management were observed, with 43% strongly disagreeing that diabetes is treatable and 65% favoring herbal remedies over modern treatments.

Practices were moderate, with 35.4% demonstrating good practices, though regular exercise (19.3%) and blood sugar monitoring (10.4%) were limited. Despite 81% including vegetables in their diet, only 30.4% consumed fruits regularly. These findings underline the urgent need for targeted educational interventions to address misconceptions, improve diabetes care knowledge, and encourage healthier lifestyle choices.

Recommendation

Based on the findings, targeted educational programs should be developed to improve understanding of diabetes management, particularly regarding insulin action and the disease's impact on life expectancy. Increased emphasis on the treatability of diabetes and the importance of controlling blood sugar levels through consistent monitoring should be prioritized. Public health campaigns should focus on promoting regular physical activity and weight management while addressing misconceptions about diabetes causes, such as the erroneous belief in curses. Enhanced awareness about the role of medication and comprehensive diabetes care, including the management of lipid and blood pressure, is crucial. Additionally, interventions should encourage healthier dietary choices and regular exercise to improve overall diabetes prevention practices.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12889-025-22902-1.

Supplementary Material 1.

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Authors' contributions
WW designed the study, participated in data collection, analysis, interpretation, and write-up, drafted, and critically revised of the manuscript. ADD, DA, DG and SH participated in the review proposal, data analysis, interpretation, and write-up, and critically revised the manuscript. All authors read and approved the final manuscript.

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Data availability
The data sets generated during and/or analyzed during the current study are available from the corresponding authors upon reasonable request.

Declarations

Ethics approval and consent to participate
The study was conducted following the Declaration of Helsinki after obtaining institutional ethical clearance from the Institutional Health Research Ethics Review Committee (IHRERC) of Oda Bultum University. The participants recruited for the study were informed about the objectives of the study. Written Informed consent was obtained from all participants. For those who were unable to read and write, consent was provided by fingerprint signature, as these participants were capable of making their own decision to participate. Data collected during the study period was used only for the study objectives. Information obtained during any course of the study was kept confidential. Confidentiality was maintained by numeric coding of the questionnaires.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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