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Predictors of Diabetes-Related Distress among People with Type 2 Diabetes in Southeast Ethiopia: cross-sectional study

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Abstract

Objective To assess predictors of Diabetes-Related Distress among people with Type 2 Diabetes in Southeast Ethiopia

Design Institution- based cross-sectional study was conducted.

Setting Six diabetic follow-up care units at public hospitals in Southeast Ethiopia

Participants All adult Type 2 diabetic patients from the diabetic follow-up Clinic

The main outcome Measures Diabetes Distress Scale (DDS17) questionnaire was used to assess Diabetes-Related Distress

Results

Out of the total 871 study participants intended,856 participated in the study with a response rate of 98.3% %. The findings showed that about 53.9 % (95% CI 50.4–57.2%) of the patients have Diabetes-Related Distress. Physical activity [AOR 2.22; 95% CI: 1.36–3.63], social support [AOR 4.41; 95% CI: 1.62–12.03], glycemic control [AOR 2.36;

95% CI: 1.35–4.12], and other co-morbidities [AOR 3.94; 95% CI: 2.01–7.73], were factors that significantly associated with diabetes-related distress at P< 0.05.

Conclusion

Despite addressing Diabetes distress improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life, a substantial number of participants had Diabetes-related distress. Therefore, the identified predictors of DRD need to be a concern for health practitioners in the management of T2DM.

Key Words: Diabetes-related distress, magnitude, associated factors

Strengths and limitations of this study

- ⇨ As a strength, this study used a contextually adopted standardized questionnaire and had a high response rate.
- ⇨ Since there is no similar study conducted in the area, it can contribute a lot as baseline information for future studies.
- ⇨ The data on Diabetes-related distress were collected through self-reporting and therefore, there may be recall bias.
- ⇨ The study could not establish a cause-and-effect relationship between DRD and the independent variables due to its cross-sectional nature.

Introduction

Type 2 diabetes mellitus (T2DM) is a leading cause of non-traumatic amputations, blindness, stroke, and end-stage renal disease. These can be prevented or delayed by strict adherence to prescribed medications and a variety of self-management behaviors. Many people with T2DM may become emotionally overwhelmed, frustrated, and discouraged by the threat of developing complications and the challenges of the complicated set of self-care activities[1]. This condition is termed Diabetes-related distress (DRD).

Diabetes-related distress (DRD) is a unique emotional problem that is directly related to the diagnosis, the threat of complications, self-management, burdens, worries of living with T2DM, and concerns about support and access to care[1, 2]. The emotional sub-scale of diabetes-related distress can be divided into four types: (1) emotional burden (the patients feel anger, fear, and depression when thinking about their diabetes), (2) physician-related distress (the patients feel that health workers do not understand their current condition and set unrealistic targets for therapy related to their diabetes), (3) regiment-related distress (the patients feel unable and unconfident in doing therapy or self-care related to their diabetes), and (4) interpersonal distress (the patients assume that their family or caretaker cannot support their therapy and understand the difficulties of living with diabetes) [3].

DRD lowers the motivation for self-care, often leading to lowered physical and emotional well-being, poor diabetes control, poor medication adherence, and increased mortality among individuals with diabetes[4]. Patients with DM experience psychological difficulties related to their chronic DM and are worried about the risk of complications[5].

Currently, Ethiopia has been challenged by the growing magnitude of non-communicable diseases (NCDs) such as diabetes and is among the top four countries with the highest adult diabetic populations aged 20–79 years in sub-Saharan Africa [6]. As information obtained from the Health Bureau, Hospital-based patient attendance rates, and medical admissions related to diabetes patients in hospitals have been rising. This requires a shift in healthcare provider systems by incorporating psychological factors such as diabetes-related distress in the treatment of diabetic patients [7].

Diabetes-related distress is the most common psychological co-morbid condition among patients with type 2 diabetes mellitus[5, 8]. Recent studies demonstrated that 60.5 %[2] and 35.6 % [9]of people with T2DM experience DRD. The few available studies conducted in Ethiopia indicated that 44.4 % [10] and 36.8 %[1] of people with Type2 DM experience DRD. The study conducted in the Amhara region missed important clinical and diabetic-related variables which might be associated with DRD, due to the limitation of their study they recommended that further studies be conducted by incorporating clinical and diabetic-related variables[10].

High levels of diabetes distress significantly impact medication-taking behaviors and are linked to lower self-efficacy, and poorer dietary and exercise behaviors [11]. High levels of DRD are a significant contributor to low levels of physical activity and nonadherence to diet and prescribed medications which in turn leads to poor glycemic control[12]. Maintaining appropriate glycemic control is important to prevent complications of diabetes. The American Diabetes Association guidelines [13] recommend that a reasonable HbA1c goal for type 2 diabetes mellitus patients is <7%, but many people do not meet the treatment goal [14]. The study done by Fiseha *et al.* revealed that 70.8% had poor status glycemic control[15]. Emotional distress made the required self-management of the disease more difficult and limited the patients' management of self-care activities necessary to achieve adequate glycemic control [14]. When compared with patients with diabetes alone, patients with diabetes and co-morbid DRD have poorer glycemic control. Uncontrolled glycemia is also associated with various serious complications including heart disease, stroke, blindness, kidney failure, and lower-limb amputation [1]. Moreover, adults with both DRD and diabetes are more likely to have poorer self-management behaviors and a higher risk of morbidity and mortality than those with only diabetes [16]. The constant behavioral demands of diabetes self-management and the potential or actuality of disease progression are directly associated with reports of diabetes distress[17].

In general, addressing DRD improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life[1]. It is therefore imperative to assess DRD among people living with diabetes mellitus (PWD) early and intervene on time.

The American Diabetes Association (ADA) recommends people with diabetes should be routinely monitored for diabetes-related distress [17]. However, from the review of the relevant literature, information regarding DRD is limited in Ethiopia. In addition, less is known about the factors that contribute to DRD and which could be targeted for intervention in the country. Therefore, this study aimed to assess the prevalence of DRD and its associated factors among type 2 diabetes patients attending hospitals in Southeast Ethiopia.

Methods

Study design and setting

An institution-based cross-sectional study was conducted at six hospitals found in Bale and East Bale zones Administration, Southeastern Ethiopia from March to April 2023. The Bale and East Bale zones are found in Oromia regional state and are located (430km and 555km, respectively) southeast of Addis Ababa, the capital city of Ethiopia. There are six hospitals delivering care including care for patients with diabetes in the zones, where six of them have diabetic follow-up care services. There are a total of 1,863 Type 2 diabetic patients on treatment follow-up in these six hospitals.

Population

The study population was all Type 2 adult diabetic patients from the diabetic follow-up clinic during the study period at six Bale and East Bale zones public hospitals (Robe Hospital, Goba Hospital, Delomena Hospital, Madda Walabu Hospital, Goro Hospital, and Ginnir Hospital), Southeast Ethiopia. All Type 2 adult diabetic patients from the diabetic follow-up sampled and who volunteered to participate were the study populations.

Sample size determination and sampling techniques

The sample size was determined using a formula for single population proportion by taking p-value from a previous study and the sample size for some factors for diabetic-related distress obtained from different pieces of literature and calculated using the Epi

Info-7 menu statically. The confidence level of 95%, power of 80%, and exposed to the unexposed ratio of 1 were also considered. Adding a non-response rate of 10% the final sample size was 871. All Type 2 diabetic patients aged ≥ 18 years who have at least six months follow-up and come into diabetic clinics were used as criteria of inclusion, whereas individuals with gestational diabetes, patients who were unable to communicate, and newly diagnosed Type 2 DM patients were excluded from the study by reviewing their medical records.

Sampling

The number of study participants from the Southeast, Ethiopia public hospitals was determined from the current total number of Type 2 diabetic patients who are on follow-up care in six hospitals. Samples were allocated to each selected Hospital based on proportional allocation to sample size. The lists of respondents or sampling frames were obtained from the updated registration books on each follow-up clinic of the hospitals. After establishing the sampling frames of respondents, a simple random sampling technique was used to identify the study unit to be included in the study. The Type 2 diabetic patients who met the inclusion criteria were recruited for the study until the required sample size was achieved.

Data collection procedure

Data were collected by eight trained nurses using a structured pretested questionnaire and the whole activities of the data collection were followed by a supervisor. A face-to-face interviewer-administered validated questionnaire was used to measure Diabetes-related distress, which was contextualized to the study area. Before data collection, we took measures to ensure meaning equivalence between the original English version of the questionnaire and the versions in the local languages. In this regard, the questionnaire was translated from English to Afaan Oromo and Amharic language by a bilingual translator and then back-translated to English by another bilingual translator. The validity of the data collection tool was checked by doing a pretest on 44 adult Type 2 diabetic

patients who were excluded from the final analysis and relevant modifications were done before the actual data collection period. A reliability test (Cronbach alpha=0.98) was performed to check the reliability of the questionnaire items. Data on selected patients' socio-demographics, personal factors, diabetic-related distress, and some clinical data were collected using a questionnaire by a trained interviewer while some clinical data (co-morbidities, complications, and fasting blood sugar) were collected from the patient's medical record card. Complications and co-morbidities were confirmed diagnoses by physicians, and they were written on the patient's medical card. Diabetes-related distress was measured by Diabetes Distress Scale (DDS17), which is a widely used and well-validated 17-item questionnaire that measures different diabetes-related stressors[1]. Each question has six answer choices: 1 – no problem, 2 – slight problem, 3 –moderate problem, 4 – a somewhat serious problem, 5 –a serious problem, and 6 – a very serious problem. The questionnaire contains four domains: Emotional Burden (5 items: questions 1, 3, 8, 11, and 14); Physician related distress (4 items: questions 2, 4, 9, and 15); Regimen related distress (5 items: questions 5, 6, 10, 12, and 16); and Interpersonal related distress (3 items: questions 7, 13, and 17).[10]. An overall mean score of less than 2.0 was considered as little to no distress, a score between 2.0 and 2.9 was considered moderate distress, and a score of 3.0 or higher was considered a high level of distress[10]. The Oslo Social Support Scale (OSSS-3) was used to measure the social support status of the respondents. Out of the sum of the raw scores that range from 3 to 14; a score of 3–8 was classified as poor support, a score of 9–11 as moderate support, and a score of ≥12 as strong support [18]. The smoking status of study participants was assessed by asking them for smoking at least one cigarette per day or smoking at least 100 cigarettes in a lifetime[19]. Alcohol consumption: Individuals were asked to report how often they consumed alcohol in the last 12 months. This variable was categorized as a binary variable that took on a value of one if the individual reported never consuming alcohol or consuming alcohol up to four times a month and a value of two when individuals reported consuming alcohol more than 4 times a week[20]. Participants' FBG readings for at least 4 months were recorded for computing the mean blood glucose level, and poor glycemic control was operationally defined if the FBG level was above 130 mg/dl[15].

Data analysis

The collected data were checked for their completeness. Then, data were coded, entered, and cleaned using Epi Data version 3.1 software and finally exported into SPSS version 25.0 software for analysis. Summary statistics were done for the outcome and independent variables. The model was tested using the Hosmer–Lemeshow goodness of fit test. The statistical significance and strength of the association between independent variables and an outcome variable were measured using the bivariate logistic regression model. The multi-co-linearity test was carried out to examine the correlation between independent variables using VIF (variable inflation factor) and none was found. Variables with p-value ≤0.2 in the bi-variable logistic regression analysis were entered into multivariable logistic regression. Finally, significant factors were identified based on a 95% confidence level adjusted odds ratio (AOR) and p-value≤0.05. Then, the results of the study were presented using tables, figures, and texts based on the data obtained.

Patient and public involvement

There was no involvement of patients in the design, recruitment, data collection, analysis, interpretation, and conduct of the study. The study results will not be distributed to the individual participants, but the published paper will be available in the participating hospitals.

Results

Socio-demographic and Personal Characteristics of study participants

A total of 856 (98.3% response rate) patients with Type 2 diabetes participated. This study indicated that 481(56.2%) of the participants were male, the mean age of the participants was 48.6 ± 11.1 years, and 493 (57.6%) of them were in the range of 41-60 years. Of the respondents, 643 (75.1%) were married, 224 (26. 2%) had no formal education, 585 (68.3 %) were from urban settings, 361 (42.2%) have not received education related to diabetes,501(58.5%) have not performed routine physical activities, and 412 (48.1%) had poor social support regarding living with diabetes. The majority 817 (95.4%) of the participants were nonsmokers, and 735 (85.9) had no history of alcohol consumption (Table 1).

Clinical-related characteristics of study participants

The study indicated that the mean duration of living with type 2 diabetes was 3.5±2.26 years with a minimum of 1 and a maximum of 20 years. Of the total study participants, 299 (34.9%) had other co-morbidities, and 135 (15.8%) developed diabetes-related complications. Regarding diabetic medications, 68.3% (585) of respondents were taking oral medication. The study also revealed that 431 (50.4%) of the study participants had poor glycemic control (Table 2).

Prevalence of Diabetes-Related Distress

As depicted in Figure 1, the total prevalence of DRD was 53.9% of which the majority 358(41.8%) were in high distress. Besides, as illustrated in Figure 2, a high percentage of distress was found in emotional and regimen-related distress with 58.1% (497) and 56.0% (479), respectively. Two important emotions contributed to the high percentage of emotional DRD. The first emotion was feeling that the diabetes is taking up too much mental and physical energy every day and the second emotion was feeling angry, scared, and/or depressed when he /she thinks about living with diabetes.

Figure 1 Levels of Diabetes -related distress among T2DM patients attending hospitals in Southeast Ethiopia, 2023 (n = 856)

Figure 2 Prevalence of diabetes-related distress and its domains among study participants with type 2 diabetes mellitus attending hospitals in Southeast Ethiopia, 2023 (n = 856)

Factors Associated with DRD Among Type 2 Diabetes Patients

Logistic regression analysis was conducted to identify factors associated with Diabetes-related distress. In the bivariate analyses, variables like the age of participants, marital status, residence, educational status, occupation, duration with diabetes, other co-morbidities, treatment regiment, hypoglycemia event in the last 3 months, education related to DM, routine physical activity, social support, taking alcohol, smoking status, diabetic related complication, glycemic control, and BMI were identified factors associated with DRD at P ≤0.2.

In multivariate analysis, routine physical activity [AOR 2.22; 95% CI: 1.36–3.63], social support [AOR 4.41; 95% CI: 1.62–12.03], glycemic control [AOR 2.36; 95% CI: 1.35–4.12], and other co-morbidities [AOR 3.94; 95% CI: 2.01–7.73], were factors that significantly associated with diabetes-related distress at P< 0.05 (Table 3).

Discussion

The current study was conducted to assess the level of Diabetes-related distress and predictors among Type 2 diabetes patients in Southeast Ethiopia. The study showed that the overall prevalence of DRD (mean DDS-17 score≥2) was 53.9 % (95% CI 50.4–57.2%) of which most of the participants were screened positive for high DRD 358(41.8%).

This finding was relatively high in comparison with previous studies conducted in China (42.15%)[14], India(19.6%)[4], Saudi Arabia (35.6%)[9], Ghana (44.7%)[12], and Oromia region, Southwest Ethiopia (36.8%)[1]. This discrepancy might be due to variations in the type of tool used to measure the level of diabetes-related distress, socio-cultural variation, lower level of education, poor quality of diabetes care service, and other forms of stressors. For Instance, in the study conducted in Ghana [12] DD was assessed using the Problem Areas in Diabetes (PAID) questionnaire. Additionally, it might be due

to differences in sample size. The study was conducted in Ghana[12], China[14], Saudi Arabia[9], India(19.6%)[4], and the Oromia region (Geleta et al., 2021 was a small sample size, whereas in our study relatively large.

On the contrary, our finding was lower than the study conducted in Indonesia (60.5%)[2], and Amhara region, Ethiopia(87.6%)[10]. This discrepancy between the previously reported DRD magnitude and the current prevalence was supported by previous studies conducted in Indonesia (60.5%)[2], and in Vietnam,[21], which documented that diabetes distress varies widely in different countries and healthcare settings and it is not also similar in terms of demographics, clinical characteristics in each geographical region and cultural backgrounds. Additionally, it might be due to variations in the study time, and variations in social support implemented to societies.

In the present study, for respondents who have not performed routine physical activities, the odds of Diabetes-related distress were 2.22 times higher than those who performed routine physical activities. This study finding provided further evidence for the finding of a study conducted in the Amhara region, Ethiopia [10], which showed that those who didn't have any planned physical exercise experienced more diabetic distress than those who have twice weekly planned physical exercise. The possible reason might be those who didn't perform routine physical activities may think they are not sticking closely enough to their supportive self-care management, which can cause high regimen-related distress.

For respondents who had poor social support regarding living with diabetes, the odds of having DRD were 4.41 times higher than that of respondents who had strong social support. Similar findings were reported in the study conducted in Indonesia[2], and Southwest Ethiopia[1]. The possible reasons for this could be social support from family or friends as a form of emotional, informational, or financial can help the patient to cope with problems and give emotional strength.

In contrast to previous study findings, having other co-morbidities was a major factor for DRD scores as compared to patients who didn't have other co-morbidities in the present study[12]. This could be explained by the fact that living with DM and other co-morbidities can experience more feelings of anger, scared, and /or depression when they think about living with DM and other co-morbidities.

This study also revealed that study participants who had poor glycemic control were 2.36 times more likely to have DRD than their counterparts. This result corresponds with the study finding in South India [8], Vietnam[22], and Ghana [12]. However, some prior studies have found no association between having glycemic control and DRD[2],[1].

Conclusion

Despite addressing Diabetes distress improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life, a substantial number of participants had Diabetes-related distress especially emotional and regimen-related distress, which causes the required self-management of the disease more difficult and limited the patients' management of self-care activities necessary to manage diabetes. Routine physical activity, social support, other co-morbidities, and glycemic control were found to be predictors of DRD.

Emotional well-being is an important part of patients' management of self-care activities necessary to manage diabetes. DRD is a common consequence of living with diabetes and impairs diabetes self-care behavior and glycemic control, clinicians should be aware of this.

The hospital administration should emphasize active screening for DRD, and it should be an integral part of diabetes care to successfully manage T2DM. Therefore, the identified predictors of DRD need to be a concern for health practitioners in the management of T2DM.

Limitation

Since the data on Diabetes-related distress were collected through self-reporting and therefore, there may be recall bias. The study also could not establish a cause-and-effect relationship between DRD and the independent variables due to its cross-sectional nature.

Abbreviations

ADA: American Diabetic Association; BRG: Bale Robe General Hospital; CI: Confidence interval; DDS: Diabetes Distress Scale; DM: Diabetes Mellitus; DRD: Diabetes-Related

Distress; IDF: International Diabetes Federation; PWD: People with Diabetes; SPSS: Statistical Package for the Social Sciences; T2DM: Type 2 Diabetes Mellitus.

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Authors' contributions

MA wrote the proposal, carried out statistical analysis, and drafted the manuscript. DF, TA, SK, KA, ZF, DG and HM approved the proposal with revisions and participated in reviewing and approving the manuscript for publication. All the authors have read and approved the final manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Ethics approval and consent to participate

This study was approved by the Research and Ethics Committee, of Madda walabu University Goba Referral Hospital with a Ref Number of /01/2/18818. Besides, an official letter was issued from Madda walabu University Goba referral hospital, Academic and Research Director to the director of each hospital. After explaining the purpose of the study, written informed consent was obtained from each study participant. All information collected from the participants was kept confidential.

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Declaration of conflicting interests

The authors declared that there is no conflict of interest.

Table 1 Socio-demographic and Personal characteristics of study participants with Type 2 Diabetes Mellitus Attending Hospitals in Southeast Ethiopia, 2023 (n=856)

Variables	Categories	Frequency	Percent
Sex	Male	481	56.2
	Female	375	43.8
Age	18-40	235	27.5
	41-60	493	57.6
	>=61	128	15.0
Marital status	Married	643	75.1
	Single	75	8.8
	Divorced	87	10.2
	Others	51	6.0
Level of education	No formal education	224	26.2
	Primary (1-8)	254	29.7
	Secondary (9-12)	253	29.6
	Diploma	76	8.9
	Degree and above	49	5.7
Residence	Rural	271	31.7
	Urban	585	68.3
Occupation/employment	Farmer	132	15.4
	Merchant	590	68.9
	Governmental	134	15.7
Hypoglycemia event in last 3 months	Yes	235	27.5
	No	621	72.5
Education related to DM	No	361	42.2
	Yes	495	57.8
Routine physical activity	No	501	58.5
	Yes	355	41.5
Social support	Poor	412	48.1
	Moderate	414	48.4
	Strong	30	3.5

Taking alcohol	Yes	121	14.1
	No	735	85.9
Smoking Status	Yes	39	4.6
	No	817	95.4

Table 2 Clinical-related characteristics of study participants with Type 2 Diabetes Mellitus Attending Hospitals in Southeast Ethiopia, 2023 (n=856)

Variables	Categories	Frequency	Percent
Duration with diabetes	<5	703	82.1
	>5	153	17.9
Other co-morbidities	Present	299	34.9
	Absent	557	65.1
Treatment regiment	Oral	585	68.3
	Insulin or combination	271	31.7
Diabetes-related complications	Present	135	15.8
	Absent	721	84.2
Glycemic Control	Uncontrolled	431	50.4
	Controlled	425	49.6
BMI (kg/m2)	Normal	645	75.4
	Overweight	168	19.6
	Obesity	43	5.0

Table 3 Factors Associated with DRD Among Type 2 Diabetes Mellitus Patients Attending Hospitals in Southeast Ethiopia, 2023 (n = 856)

Variables	Diabetes Distress		COR with 95% CI	AOR with 95% CI
	Yes	No		

Age				
18-40	84(35.7%)	151(64.3%)	0.19(0.11,0.29)	1.35(0.55,3.31)
41-60	280(56.8%)	213(43.2%)	0.42(0.27,0.65)	1.95(0.88,4.31)
>=61	97(75.8%)	31(24.2%)	1	
Marital Status				
Married	331(51.5%)	312(48.5%)	0.29(0.15,0.58)	1.76(0.59,5.24)
Single	26(34.7%)	49(65.3%)	0.15(0.06,0.33)	2.16(0.58,7.96)
Divorced	64(73.6%)	23(26.4%)	0.77(0.34,1.74)	0.81(0.25,2.61)
Others	40(78.4%)	11(21.6%)	1	
Residence				
Rural	191(70.5%)	80(29.5%)	2.79(2.05,3.79)	0.753(0.38,1.48)
Urban	270(46.2%)	315(53.8%)	1	
Educational Status				
No formal education	181(80.8%)	43(19.2%)	9.54(4.77,19.07)	0.844(0.23,3.17)
Primary (1-8)	141(55.5%)	113(44.5%)	2.83(1.47,5.45)	0.565(0.18,1.82)
Secondary (9-12)	98(38.7%)	155(61.3%)	1.43(0.74,2.77)	0.511(0.16,1.59)
Diploma	26(34.2%)	50(65.8%)	1.18(0.55,2.55)	1.609(0.61,4.25)
Degree and above	15(30.6%)	34(69.4%)	1	
Occupation/employment				
Farmer	93(70.5%)	39(29.5%)	4.27(2.56,7.15)	1.66(0.57,4.86)
Merchant	320(54.2%)	270(45.8%)	2.12(1.44,3.13)	1.74(0.73,4.15)
Governmental	48(35.8%)	86(64.2%)	1	
Duration with diabetes				
<5	327(46.5%)	376(53.5%)	0.12(0.08,0.2)	0.63(0.29,1.39)
>5	134(87.6%)	19(12.4%)	1	
Other co-morbidities				
Present	252(84.3%)	47(15.7%)	8.93(6.26,12.74)	3.94(2.01,7.73) **

Absent	209(37.5%)	348(62.5%)	1	1
Treatment regiment				
Insulin or combination	174(64.2%)	97(35.8%)	1.86(1.39,2.51)	0.63(0.37,1.07)
Oral	287(49.1%)	298(50.9%)	1	
Hypoglycemia Event in the last 3 months				
Yes	156(66.4%)	79(33.6%)	2.05(1.49,2.79)	0.678(0.39,1.16)
No	305(49.1%)	316(50.9%)	1	
Education related to DM				
No	272(75.3%)	89(24.7%)	4.95(3.67,6.68)	1.588(0.99,2.55)
Yes	189(38.2%)	306(61.8%)	1	
Routine physical activity				
No	365(72.9%)	136(27.1%)	7.24(5.33,9.83)	2.22(1.36,3.63) **
Yes	96(27.0%)	259(73.0%)	1	1
Social support				
Poor	334(81.1%)	78(18.9%)	17.13(6.77,43.32)	4.41(1.62,12.03) *
Moderate	121(29.2%)	293(70.8%)	1.65(0.66,4.14)	1.31(0.49,3.52)
Strong	6(20.0%)	24(80.0%)	1	1
Taking alcohol				
Yes	101(83.5%)	20(16.5%)	5.26(3.19,8.68)	1.28(0.59,2.75)
No	360(49.0%)	375(51.0%)	1	
Smoking Status				
Yes	33(84.6%)	6(15.4%)	4.99(2.07,12.06)	1.31(0.33,5.18)
No	428(52.4%)	389(47.6%)	1	
Diabetes-related complications				
Present	119(88.1%)	16(11.9%)	8.24(4.79,14.17)	0.87(0.36,2.08)

Absent	342(47.4%)	379(52.6%)	1	
Glycemic Control				
Uncontrolled	363(84.2%)	98(23.1%)	17.81(12.63,25.11)	2.36(1.35,4.12) *
Controlled	68(15.8%)	327(76.9%)	1	1
BMI (kg/m2)				
Normal	284(44.0%)	361(56.0%)	0.02(0.00,0.01)	0.16(0.02,1.42)
Overweight	135(80.4%)	33(19.6%)	0.09(0.01,0.73)	0.29(0.03,2.62)
Obesity	42(97.7%)	1(2.3%)	1	1

Note: AOR adjusted odds ratio, BMI = weight (kg)/height (m)2, CI confidence interval, COR crude odds ratio, * Variables significant with p-value≤0.005, ** Variables significant with p-value≤0.001.

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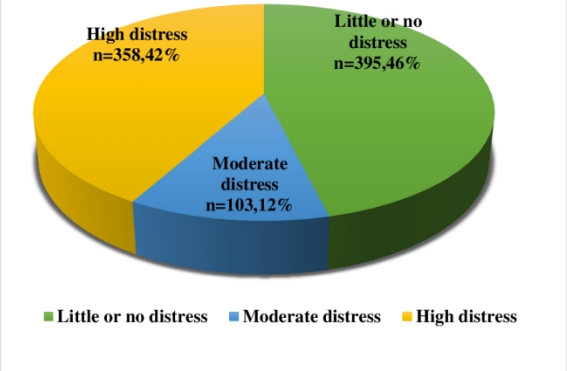

Figure 1 Levels of Diabetes -related distress among T2DM patients attending hospitals in Southeast Ethiopia, 2023 (n = 856)

215x279mm (200 x 200 DPI)

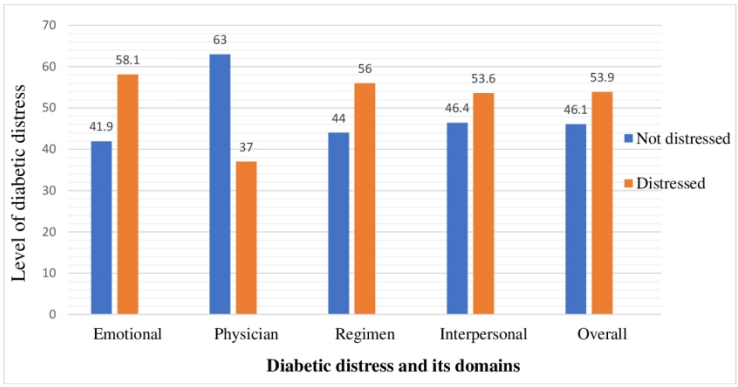

Figure 2 Prevalence of diabetes-related distress and its domains among study participants with type 2 diabetes mellitus attending hospitals in Southeast Ethiopia, 2023 (n = 856)

215x279mm (200 x 200 DPI)

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	Predictors of Diabetes-Related Distress among people with Type 2 Diabetes in Southeast Ethiopia: cross-sectional study	1
		Out of the total 871 study participants planned,856 participated in the study with a response rate of 98.3% %. The findings showed that about 53.9 % (95% CI 50.4–57.2%) of the patients have Diabetes-Related Distress. Physical activity [AOR 2.22; 95% CI: 1.36–3.63], social support [AOR 4.41; 95% CI: 1.62–12.03], glycemic control [AOR 2.36; 95% CI: 1.35–4.12], and other co-morbidities [AOR 3.94; 95% CI: 2.01–7.73], were factors that significantly associated with diabetes-related distress at P< 0.05. Despite addressing Diabetes distress improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life, a substantial number of participants had Diabetes-related distress. Therefore, the identified predictors of DRD need to be a concern for health practitioners in the management of T2DM.	1-2
Introduction			
Background/rationale	2	Diabetes-related distress (DRD) is a unique emotional problem that is directly related to the diagnosis, the threat of complications, self-management, burdens, worries of living with T2DM, and concerns about support and access to care. DRD lowers the motivation for self-care, often leading to lowered physical and emotional well-being, poor diabetes control, poor adherence to medication, and increased mortality among individuals with diabetes. Addressing DRD improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life. It is therefore imperative to assess DRD among people living with diabetes mellitus (PWD) early and intervene in a timely manner. The American Diabetes Association (ADA) recommends people with diabetes should be routinely monitored for diabetes-related distress. However, from the review of the relevant literature, information regarding DRD is limited in Ethiopia. In addition, less is known about the factors that contribute to DRD and which could be targeted for intervention in the country.	3-5
Objectives	3	The aim of this study was to assess the prevalence of DRD and its associated factors among type 2 diabetes patients attending hospitals in Southeast Ethiopia.	5
Methods			
Study design	4	Institutional-based cross-sectional study design was conducted	5

		among Type 2 diabetic patients.	
Setting	5	Using institutional based cross-sectional survey, 871 adult Type 2 diabetic patients who have follow up and selected through simple random sampling method from Bale and East Bale zones public hospitals screened for DRD. The study was conducted from March to April 2023.	5
Participants	6	-All Type 2 adult diabetic patients at public hospitals in Southeast Ethiopia were source of population. - All Type 2 diabetic patients aged ≥ 18 years who have at least six months follow-up and come into diabetic clinics were used as criteria of inclusion, whereas individuals with gestational diabetes, patients who were unable to communicate, and newly diagnosed Type 2 DM patients were excluded from the study by reviewing their medical records. -Simple random sampling technique was used to identify the study unit to be included to the study.	6
Variables	6	***Dependent Variable*** Diabetes-related distress ***Independent Variables*** **Socio- Demographic Factors:** Sex, age, residence, marital status, educational status, occupation **Clinical Factors:** Duration with dm, comorbidities, mode of current treatment, hypoglycemia event in the last 3 months, education related to dm, dm related complications, glycemic control, body mass index. **Personal factors**: - Routine physical activity, social support, drinking alcohol, cigarette smoking.	7
Data sources/ measurement	8	To assure the quality of data, training was given for data collectors and supervisors about the aim of the study, data collection procedure and ethical issues. Validity was checked by doing pretest on 5 % of DM patients at Dodola Hospital (out of the study area). Modification of the tool was made based on the pretest result. For reliability test (Cronbach alpha value of 0.98) was performed to check the reliability of the questionnaire items. Close supervision was made during data collection. Data clean up and crosschecking was also done before analysis. Finally, multivariate analysis was run in the binary logistic regression model to control the confounding factors.	8
Bias	7	Pretest was done and training was given for data collectors	*8*
Study size	8	871	5-6
Statistical methods	9	Binary logistic regression was used for the analysis of outcome variable.	8

Results			
Participants	10	Out of the total 871 study participants planned,856 participated in the study with a response rate of 98.3% %. This study indicated that 481(56.2%) of the participants were male, the mean age of the participants was 48.6 ± 11.1 years, and 493 (57.6%) of them were in the range of 41-60 years. Of the respondents, 643 (75.1%) were married, 224 (26. 2%) had no formal education, 585 (68.3 %) were from the urban settings, 361 (42.2%) have not received education related to diabetes,501(58.5%) have not performed routine physical activities, and 412 (48.1%) had poor social support regarding living with diabetes. The majority 817 (95.4%) of the participants were nonsmokers, and 735 (85.9) had no history of alcohol consumption. -The study indicated that the mean duration of living with type 2 diabetes was 3.5±2.26 years with a minimum of 1 and a maximum of 20 years. Of the total study participants, 299 (34.9%) had other co-morbidities, and 135 (15.8%) developed diabetes-related complications. Regarding diabetic medications, 68.3% (585) of respondents were taking oral medication. The study also revealed that 431 (50.4%) of the study participants had poor glycemic control.	9
Main results	11	**Factors associated with self-care practices during bivariate logistic regression analysis.** Logistic regression analysis was conducted to identify factors associated with Diabetes-related distress. In the bivariate analyses, variables like the age of participants, marital status, residence, educational status, occupation, duration with diabetes, other co-morbidities, treatment regiment, hypoglycemia event in the last 3 months, education related to DM, routine physical activity, social support, taking alcohol, smoking status, diabetic related complication, glycemic control, and BMI were identified factors associated with DRD at P ≤0.2. **Multivariate logistic regression analysis for self-care practice** In multivariate analysis, routine physical activity [AOR 2.22; 95% CI: 1.36–3.63], social support [AOR 4.41; 95% CI: 1.62–12.03], glycemic control [AOR 2.36; 95% CI: 1.35–4.12], and other co-morbidities [AOR 3.94; 95% CI: 2.01–7.73], were factors that significantly associated with diabetes-related distress at P< 0.05.	10
Discussion			
Key results	12	The current study was conducted to assess the level of Diabetes-related distress and predictors among Type 2 diabetes patients in	10-12

		Southeast Ethiopia. The study showed that the overall prevalence of DRD (mean DDS-17 score≥2) was 53.9 % (95% CI 50.4–57.2%) of which most of the participants were screened positive for high DRD 358(41.8%). -Routine physical activity, social support, other co-morbidities, and glycemic control were found to be predictors of DRD. -Despite addressing Diabetes distress improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life, a substantial number of participants had Diabetes-related distress especially emotional and regimen-related distress, which causes the required self-management of the disease more difficult and limited the patients' management of self-care activities necessary to manage diabetes.	
Limitations	13	Since the data on Diabetes-related distress were collected through self-reporting and therefore, there may be recall bias. The study also could not establish a cause-and-effect relationship between DRD and the independent variables due to its cross-sectional nature.	12
Interpretation	14	Generally, our findings reveal that a significant number of Type 2 diabetes patients had Diabetes -related distress. Routine physical activity, social support, other co-morbidities, and glycemic control were found to be predictors of DRD. The hospital administration should emphasize active screening for DRD, and it should be an integral part of diabetes care to successfully manage T2DM. Therefore, the identified predictors of DRD need to be a concern for health practitioners in the management of T2DM.	12
Other information			
Funding	15	Not applicable.	13

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Diabetes-related distress and its associated factors among People with Type 2 diabetes in Southeast Ethiopia: cross-sectional study

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Abstract

Background

Diabetes-related distress lowers the motivation for self-care, often leading to lowered physical and emotional well-being, poor diabetes control, poor medication adherence, and increased mortality among individuals with diabetes.

Objective To assess factors associated with diabetes-related distress among people living with Type 2 diabetes in Southeast Ethiopia

Design Institution- based cross-sectional study was conducted.

Setting Six diabetic follow-up care units at public hospitals in Southeast Ethiopia

Participants All adult people living with Type 2 diabetes from the diabetic follow-up Clinic

The main outcome measures Diabetes Distress Scale (DDS17) questionnaire was used to assess diabetes-related distress

Results

Out of the total 871 study participants intended, 856 participated in the study with a response rate of 98.3%. The findings showed that about 53.9 % (95% CI 50.4–57.2%) of the patients have diabetes-related distress. Physical activity [AOR 2.22; 95% CI: 1.36–3.63], social support [AOR 4.41; 95% CI: 1.62–12.03], glycemic control [AOR 2.36; 95% CI: 1.35–4.12], and other co-morbidities [AOR 3.94; 95% CI: 2.01–7.73], were factors that significantly associated with diabetes-related distress at P< 0.05.

Conclusion

This study demonstrated that more than half of the participants had diabetes-related distress. Therefore, the identified factors of diabetes-related distress need to be a concern for health institutions and clinicians in the management of people living with Type 2 diabetes.

Key Words: diabetes-related distress, distress, Type 2 diabetes, Southeast Ethiopia

Strengths and limitations of this study

- ⇨ As a strength, this study looked at a large sample size (N=856), the findings were interpreted appropriately and had a high response rate.
- ⇨ Since there is no similar study conducted in the area, it can contribute a lot as baseline information for future studies.
- ⇨ The data on diabetes-related distress were collected through self-reporting and therefore, there may be recall bias.
- ⇨ The use of a cross-sectional design limits the generalizability of its findings outside of the population from which the study sample was drawn.

Introduction

Type 2 diabetes mellitus (T2DM) is a leading cause of non-traumatic amputations, blindness, stroke, and end-stage renal disease. These can be prevented or delayed by strict adherence to prescribed medications and a variety of self-management behaviors. Many people with T2DM may become emotionally overwhelmed, frustrated, and

discouraged by the threat of developing complications and the challenges of the complicated set of self-care activities[1]. This condition is termed diabetes-related distress (DRD).

Diabetes-related distress (DRD) is a unique emotional problem that is directly related to the diagnosis, the threat of complications, self-management, burdens, worries of living with T2DM, and concerns about support and access to care[1, 2]. The emotional sub-scale of diabetes-related distress can be divided into four types: (1) emotional burden (the patients feel anger, fear, and depression when thinking about their diabetes), (2) physician-related distress (the patients feel that health workers do not understand their current condition and set unrealistic targets for therapy related to their diabetes), (3) regiment-related distress (the patients feel unable and unconfident in doing therapy or self-care related to their diabetes), and (4) interpersonal distress (the patients assume that their family or caretaker cannot support their therapy and understand the difficulties of living with diabetes) [3].

DRD lowers the motivation for self-care, often leading to lowered physical and emotional well-being, poor diabetes control, poor medication adherence, and increased mortality among individuals with diabetes[4]. Patients with DM experience psychological difficulties related to their chronic DM and are worried about the risk of complications[5].

Currently, Ethiopia has been challenged by the growing magnitude of non-communicable diseases (NCDs) such as diabetes and is among the top four countries with the highest adult diabetic populations aged 20–79 years in sub-Saharan Africa [6]. As information obtained from the Health Bureau, Hospital-based patient attendance rates, and medical admissions related to diabetes patients in hospitals have been rising. This requires a shift in healthcare provider systems by incorporating psychological factors such as diabetes-related distress in the treatment of diabetic patients [7].

Diabetes-related distress is a prevalent psychological co-morbid condition among patients with type 2 diabetes mellitus[5, 8]. Recent studies demonstrated that 60.5 %[2] and 35.6 % [9] of people with T2DM experience DRD. In Ethiopia, the few available studies indicated that 44.4 % [10] and 36.8 %[1] of people with Type2 DM experience DRD. However, a study conducted in the Amhara region, Ethiopia had limitations and

missed important clinical and diabetic-related variables that might be associated with DRD. Therefore, further studies are recommended to incorporate these variables to better understand DRD among people with type 2 diabetes mellitus in Ethiopia [10].

High levels of diabetes distress have a significant impact on medication-taking behaviors, lower self-efficacy, and poorer dietary and exercise behaviors [11]. High levels of DRD are a significant contributor to low levels of physical activity and nonadherence to diet and prescribed medications which in turn leads to poor glycemic control[12]. Maintaining appropriate glycemic control is important to prevent complications of diabetes. The American Diabetes Association guidelines [13] recommend that a reasonable HbA1c goal for type 2 diabetes mellitus patients is <7%, but many people do not meet the treatment goal [14]. The study done by Fiseha *et al.* revealed that 70.8% had poor status glycemic control[15]. Emotional distress made the required self-management of the disease more difficult and limited the patients' management of self-care activities necessary to achieve adequate glycemic control [14]. When compared with patients with diabetes alone, patients with diabetes and co-morbid DRD have poorer glycemic control. Uncontrolled glycemia is also associated with various serious complications including heart disease, stroke, blindness, kidney failure, and lower-limb amputation [1]. Moreover, adults with both DRD and diabetes are more likely to have poorer self-management behaviors and a higher risk of morbidity and mortality than those with only diabetes [16]. The constant behavioral demands of diabetes self-management and the potential or actuality of disease progression are directly associated with reports of diabetes distress[17].

In general, addressing DRD improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life[1]. It is therefore imperative to assess DRD among people living with diabetes mellitus (PWD) early and intervene on time.

The American Diabetes Association (ADA) recommends people with diabetes should be routinely monitored for diabetes-related distress [17]. However, from the review of the relevant literature, information regarding DRD is limited in Ethiopia. In addition, less is known about the factors that contribute to DRD and which could be targeted for intervention in the country. Therefore, this study aimed to assess the prevalence of DRD

and its associated factors among people living with Type 2 diabetes attending hospitals in Southeast Ethiopia.

Methods

Study design and setting

An institution-based cross-sectional study was conducted at six hospitals found in Bale and East Bale zones Administration, Southeastern Ethiopia from March to April 2023. The Bale and East Bale zones are found in Oromia regional state and are located (430km and 555km, respectively) southeast of Addis Ababa, the capital city of Ethiopia. There are six hospitals delivering care including care for patients with diabetes in the zones, where six of them have diabetic follow-up care services. There are a total of 1,863 Type 2 diabetic patients on treatment follow-up in these six hospitals.

Population

The study population was adult people living with Type 2 diabetes from the diabetic follow-up clinic during the study period at six Bale and East Bale zones public hospitals (Robe Hospital, Goba Hospital, Delomena Hospital, Madda Walabu Hospital, Goro Hospital, and Ginnir Hospital), Southeast Ethiopia. All adult people living with Type 2 diabetes from the diabetic follow-up sampled and who volunteered to participate were the study populations.

Sample size determination and sampling techniques

The sample size was determined using a formula for single population proportion by taking p-value from a previous study, and double population formula using Epi Info Version 7 menu statically for individual factors to DRD using the assumption of 80% power and 1:1 ratio of exposed to non-exposed. After adding a non-response rate of 10% the final sample size was 871. All people living with Type 2 diabetes aged ≥ 18 years who have at least six months follow-up and come into diabetic clinics were used as criteria of inclusion, whereas individuals with gestational diabetes, patients who were unable to

communicate, and newly diagnosed Type 2 DM patients were excluded from the study by reviewing their medical records.

Sampling

The number of study participants from the Southeast, Ethiopia public hospitals was determined from the current total number of people living with Type 2 diabetes who are on follow-up care in six hospitals. Samples were allocated to each selected Hospital based on proportional allocation to sample size. The lists of respondents or sampling frames were obtained from the updated registration books on each follow-up clinic of the hospitals. After establishing the sampling frames of respondents, a simple random sampling technique was used to identify the study unit to be included in the study. The people living with Type 2 diabetes who met the inclusion criteria were recruited for the study until the required sample size was achieved.

Data collection procedure

Data were collected by eight trained nurses using a structured pretested questionnaire and the whole activities of the data collection were followed by a supervisor. A face-to-face interviewer-administered validated questionnaire was used to measure Diabetes-related distress, which was contextualized to the study area. Before data collection, we took measures to ensure meaning equivalence between the original English version of the questionnaire and the versions in the local languages. In this regard, the questionnaire was translated from English to Afaan Oromo and Amharic language by a bilingual translator and then back-translated to English by another bilingual translator (Supplementary File 1, Supplementary File 2, and Supplementary File 3). The validity of the data collection tool was checked by doing a pretest on 44 adult Type 2 diabetic patients who were excluded from the final analysis and relevant modifications were done before the actual data collection period. A reliability test (Cronbach alpha=0.98) was performed to check the reliability of the questionnaire items. Data on selected people living with Type 2 diabetes socio-demographics, personal factors, diabetic-related distress, and some clinical data were collected using a questionnaire by a trained

interviewer while some clinical data (co-morbidities, complications, and fasting blood sugar) were collected from the patient's medical record card. Complications and co-morbidities were confirmed diagnoses by physicians, and they were written on the patient's medical card. Diabetes-related distress was measured by the Diabetes Distress Scale (DDS17), which is a widely used and well-validated 17-item questionnaire that measures different diabetes-related stressors[1]. Each question has six answer choices: 1 – no problem, 2 – slight problem, 3 –moderate problem, 4 – a somewhat serious problem, 5 –a serious problem, and 6 – a very serious problem. The questionnaire contains four domains: Emotional Burden (5 items: questions 1, 3, 8, 11, and 14); Physician related distress (4 items: questions 2, 4, 9, and 15); Regimen related distress (5 items: questions 5, 6, 10, 12, and 16); and Interpersonal related distress (3 items: questions 7, 13, and 17) [10]. An overall mean score of DRD(four domains) less than 2.0 was considered as little to no distress, a score between 2.0 and 2.9 was considered moderate distress, and a score of 3.0 or higher was considered a high level of distress[10]. The Oslo Social Support Scale (OSSS-3) was used to measure the social support status of the respondents. Out of the sum of the raw scores that range from 3 to 14; a score of 3–8 was classified as poor support, a score of 9–11 as moderate support, and a score of ≥12 as strong support [18]. The smoking status of study participants was assessed by asking them to smoke at least one cigarette per day or smoking at least 100 cigarettes in a lifetime[19]. Alcohol consumption: Individuals were asked to report how often they consumed alcohol in the last 12 months. This variable was categorized as a binary variable that took on a value of one if the individual reported never consuming alcohol or consuming alcohol up to four times a month and a value of two when individuals reported consuming alcohol more than 4 times a week[20]. Participants' FBG readings for at least 4 months were recorded for computing the mean blood glucose level, and poor glycemic control was operationally defined if the FBG level was above 130 mg/dl[15].

Study variables

Dependent variable -Diabetes-related distress.

Independent variables-

Socio-demographic: Sex, age, residence, marital status, educational status, occupation

Clinical: - Duration with dm, comorbidities, mode of current treatment, hypoglycemia event in the last 3 months, education related to dm, dm related complications, glycemic control, body mass index

Personal factors: - Routine physical activity, social support, drinking alcohol, cigarette smoking.

Operational definitions

Diabetic distress: It refers to a negative emotional reaction that the patient experiences as a result of having and living with diabetes[10].

Diabetic-Related Distress: The Diabetes Distress Scale (DDS17) was used to measure each patient's diabetes-related distress. Categorization was done using the overall mean scores as a score of less than 2.0 was considered as little to no distress, a score between 2.0 and 2.9 was considered moderate distress, and a score of 3.0 or higher was considered a high level of distress[10].

Data analysis

The collected data were checked for their completeness. Then, data were coded, entered, and cleaned using Epi Data version 3.1 software and finally exported into SPSS version 25.0 software for analysis. Summary statistics were done for the outcome and independent variables. The model was tested using the Hosmer–Lemeshow goodness of fit test. The statistical significance and strength of the association between independent variables and an outcome variable were measured using the bivariate logistic regression model. The multi-co-linearity test was carried out to examine the correlation between independent variables using VIF (variable inflation factor) and none was found. Variables with p-value ≤0.25 in the bi-variable logistic regression analysis were entered into multivariable logistic regression. Finally, significant factors were identified based on a 95% confidence level adjusted odds ratio (AOR) and p-value≤0.05. Then, the results of the study were presented using tables, figures, and texts based on the data obtained.

Patient and public involvement

There was no involvement of patients in the design, recruitment, data collection, analysis, interpretation, and conduct of the study. The study results will not be distributed to the individual participants, but the published paper will be available in the participating hospitals.

Results

Socio-demographic and Personal Characteristics of study participants

A total of 856 (98.3% response rate) people living with Type 2 diabetes participated. This study indicated that 481(56.2%) of the participants were male, the mean age of the participants was 48.6 ± 11.1 years, and 493 (57.6%) of them were in the range of 41-60 years. Of the respondents, 643 (75.1%) were married, 224 (26. 2%) had no formal education, 585 (68.3 %) were from urban settings, 361 (42.2%) had not received education related to diabetes,501(58.5%) have not performed routine physical activities, and 412 (48.1%) had poor social support regarding living with diabetes. The majority 817 (95.4%) of the participants were nonsmokers, and 735 (85.9) had no history of alcohol consumption (Table 1).

Clinical-related characteristics of study participants

The study indicated that the mean duration of living with type 2 diabetes was 3.5±2.26 years with a minimum of 1 and a maximum of 20 years. Of the total study participants, 299 (34.9%) had other co-morbidities, and 135 (15.8%) developed diabetes-related complications. Regarding diabetic medications, 68.3% (585) of respondents were taking oral medication. The study also revealed that 431 (50.4%) of the study participants had poor glycemic control (Table 2).

Prevalence of Diabetes-Related Distress

As depicted in Figure 1, the total prevalence of DRD was 53.9% of which the majority 358(41.8%) were in high distress. Besides, as illustrated in Figure 2, a high percentage of distress was found in emotional and regimen-related distress with 58.1% (497) and 56.0% (479), respectively. Two important emotions contributed to the high percentage of emotional DRD. The first emotion was feeling that the diabetes is taking up too much mental and physical energy every day and the second emotion was feeling angry, scared, and/or depressed when he /she thinks about living with diabetes (Supplementary File 4).

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Figure 1 Levels of Diabetes -related distress among T2DM patients attending hospitals in Southeast Ethiopia, 2023 (n = 856)

Figure 2 Prevalence of diabetes-related distress and its domains among study participants with type 2 diabetes mellitus attending hospitals in Southeast Ethiopia, 2023 (n = 856)

Factors Associated with DRD Among Type 2 Diabetes Patients

Logistic regression analysis was conducted to identify factors associated with Diabetes-related distress. In the bivariate analyses, variables like the age of participants, marital status, residence, educational status, occupation, duration with diabetes, other co-morbidities, treatment regiment, hypoglycemia event in the last 3 months, education related to DM, routine physical activity, social support, taking alcohol, smoking status, diabetic related complication, glycemic control, and BMI were identified factors associated with DRD at P ≤0.25.

In multivariate analysis, routine physical activity [AOR 2.22; 95% CI: 1.36–3.63], social support [AOR 4.41; 95% CI: 1.62–12.03], glycemic control [AOR 2.36; 95% CI: 1.35–4.12], and other co-morbidities [AOR 3.94; 95% CI: 2.01–7.73], were factors that significantly associated with diabetes-related distress at P< 0.05 (Supplementary Table 1).

Discussion

The current study was conducted to assess the level of diabetes-related distress and its associated factors among people living with Type 2 diabetes in Southeast Ethiopia. The study showed that the overall prevalence of DRD (mean DDS-17 score≥2) was 53.9 % (95% CI 50.4–57.2%) of which most of the participants were screened positive for high DRD 358(41.8%).

This finding was relatively high in comparison with previous studies conducted in China (42.15%)[14], India(19.6%)[4], Saudi Arabia (35.6%)[9], Ghana (44.7%)[12], and Oromia region, Southwest Ethiopia (36.8%)[1]. This discrepancy might be due to variations in the type of tool used to measure the level of diabetes-related distress, socio-cultural variation, lower level of education, poor quality of diabetes care service, a lack of DRD screening services, and other forms of stressors. For Instance, in the study conducted in Ghana [12] DD was assessed using the Problem Areas in Diabetes (PAID) questionnaire. Additionally, it might be due to differences in sample size. The study was conducted in Ghana[12], China[14], Saudi Arabia[9], India(19.6%)[4], and the Oromia region (Geleta et al., 2021 was a small sample size, whereas in our study relatively large.

On the contrary, our finding was lower than the study conducted in Indonesia (60.5%)[2], and Amhara region, Ethiopia(87.6%)[10]. This discrepancy between the previously reported DRD magnitude and the current prevalence was supported by previous studies conducted in Indonesia (60.5%)[2], and in Vietnam,[21], which documented that diabetes distress varies widely in different countries and healthcare settings and it is not also similar in terms of demographics, clinical characteristics in each geographical region and cultural backgrounds. Additionally, it might be due to variations in the study time, and variations in social support implemented to societies.

In the present study, for respondents who have not performed routine physical activities, the odds of diabetes-related distress were 2.22 times higher than those who performed routine physical activities. This study finding provided further evidence for the findings of a study conducted in the Amhara region, Ethiopia [10], which showed that those who didn't have any planned physical exercise experienced more diabetes distress than those who had twice-weekly planned physical exercise. The possible reason might be those

who didn't perform routine physical activities may think they are not sticking closely enough to their supportive self-care management, which can cause high regimen-related distress.

For respondents who had poor social support regarding living with diabetes, the odds of having DRD were 4.41 times higher than that of respondents who had strong social support. Similar findings were reported in the study conducted in Indonesia[2], and Southwest Ethiopia[1]. The possible reasons for this could be social support from family or friends as a form of emotional, informational, or financial can help the patient to cope with problems and give emotional strength.

In contrast to previous study findings, having other co-morbidities was a major factor for DRD scores as compared to patients who didn't have other co-morbidities in the present study[12]. This could be explained by the fact that living with DM and other co-morbidities can experience more feelings of anger, scared, and /or depression when they think about living with DM and other co-morbidities.

This study also revealed that study participants who had poor glycemic control were 2.36 times more likely to have DRD than their counterparts. This result corresponds with the study findings in South India [8], Vietnam[22], and Ghana [12]. However, some prior studies have found no association between having glycemic control and DRD[2],[1].

The study's limitations, Since the data on diabetes-related distress were collected through self-reporting and therefore, there may have been recalled bias and social desirability bias. Additionally, the use of a cross-sectional design limits the generalizability of its findings outside of the population from which the study sample was drawn.

Implications for Clinical Practice

These study findings are significant for understanding DRD and its associated factors among individuals with type 2 diabetes. Based on the results, it is recommended to promote physical activity and glycemic control, provide social context-specific interventions to address DRD and offer health education on lifestyle, exercise, and healthy diet for individuals with diabetes. Health professionals should receive intensive training on counseling techniques to improve their patients' counseling and handling skills.

Additionally, a counseling center should be established within hospitals to support and assist individuals with diabetes who experience DRD during the onset or treatment period.

Conclusion

Despite addressing Diabetes distress improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life, a substantial number of participants had diabetes-related distress especially emotional and regimen-related distress, which causes the required self-management of the disease more difficult and limited the patients' management of self-care activities necessary to manage diabetes. Routine physical activity, social support, other co-morbidities, and glycemic control were found to be factors of DRD.

Emotional well-being is an important part of patients' management of self-care activities necessary to manage diabetes. DRD is a common consequence of living with diabetes and impairs diabetes self-care behavior and glycemic control, clinicians should be aware of this.

The hospital administration should emphasize active screening for DRD, and it should be an integral part of diabetes care to successfully manage T2DM. Therefore, the identified factors of DRD need to be a concern for health institutions and health professionals in the management of people living with Type 2 diabetes.

Abbreviations

ADA: American Diabetic Association; BRG: Bale Robe General Hospital; CI: Confidence interval; DDS: Diabetes Distress Scale; DM: Diabetes Mellitus; DRD: Diabetes-Related Distress; IDF: International Diabetes Federation; PWD: People with Diabetes; SPSS: Statistical Package for the Social Sciences; T2DM: Type 2 Diabetes Mellitus.

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Authors' contributions

MA wrote the proposal, carried out statistical analysis, and drafted the manuscript. DF, TA, SK, KA, ZF, DG, and HM approved the proposal with revisions and participated in reviewing and approving the manuscript for publication. All the authors have read and approved the final manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Ethics approval and consent to participate

This study was approved by the Research and Ethics Committee, of Madda walabu University Goba Referral Hospital with a Ref Number of /01/2/18818. Besides, an official letter was issued from Madda walabu University Goba referral hospital, Academic and Research Director to the director of each hospital. After explaining the purpose of the study, written informed consent was obtained from each study participant. All information collected from the participants was kept confidential.

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Declaration of conflicting interests

The authors declared that there is no conflict of interest.

Supplementary files

Supplementary File 1. Study Questionnaire English Version

Supplementary File 2. Study Questionnaire Afaan Oromoo Version

Supplementary File 3. Study Questionnaire Amharic Version

Supplementary File 4. Frequencies table for all DRD items

Supplementary Table 1

Table 1 Socio-demographic and Personal characteristics of study participants with Type 2 Diabetes Mellitus Attending Hospitals in Southeast Ethiopia, 2023 (n=856)

Variables	Categories	Frequency	Percent
Sex	Male	481	56.2
	Female	375	43.8
Age	18-40	235	27.5
	41-60	493	57.6
	>=61	128	15.0
Marital status	Married	643	75.1
	Single	75	8.8
	Divorced	87	10.2
	Others	51	6.0
Level of education	No formal education	224	26.2
	Primary (1-8)	254	29.7
	Secondary (9-12)	253	29.6
	Diploma	76	8.9
	Degree and above	49	5.7
Residence	Rural	271	31.7
	Urban	585	68.3
Occupation/employment	Farmer	132	15.4
	Merchant	590	68.9
	Governmental	134	15.7
Hypoglycemia event in last 3 months	Yes	235	27.5
	No	621	72.5
Education related to DM	No	361	42.2
	Yes	495	57.8
Routine physical activity	No	501	58.5
	Yes	355	41.5
Social support	Poor	412	48.1
	Moderate	414	48.4
	Strong	30	3.5

Taking alcohol	Yes	121	14.1
	No	735	85.9
Smoking Status	Yes	39	4.6
	No	817	95.4

Table 2 Clinical-related characteristics of study participants with Type 2 Diabetes Mellitus Attending Hospitals in Southeast Ethiopia, 2023 (n=856)

Variables	Categories	Frequency	Percent
Duration with diabetes	<5	703	82.1
	>5	153	17.9
Other co-morbidities	Present	299	34.9
	Absent	557	65.1
Treatment regiment	Oral	585	68.3
	Insulin or combination	271	31.7
Diabetes-related complications	Present	135	15.8
	Absent	721	84.2
Glycemic Control	Uncontrolled (≥130 mg/dl)	431	50.4
	Controlled (<130 mg/dl)	425	49.6
BMI (kg/m2)	Normal	645	75.4
	Overweight	168	19.6
	Obesity	43	5.0

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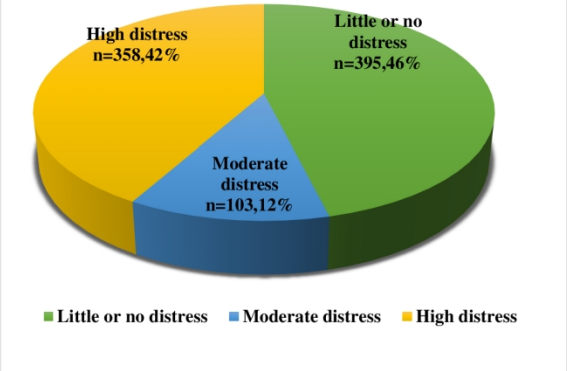

Figure 1 Levels of Diabetes -related distress among T2DM patients attending hospitals in Southeast Ethiopia, 2023 (n = 856)

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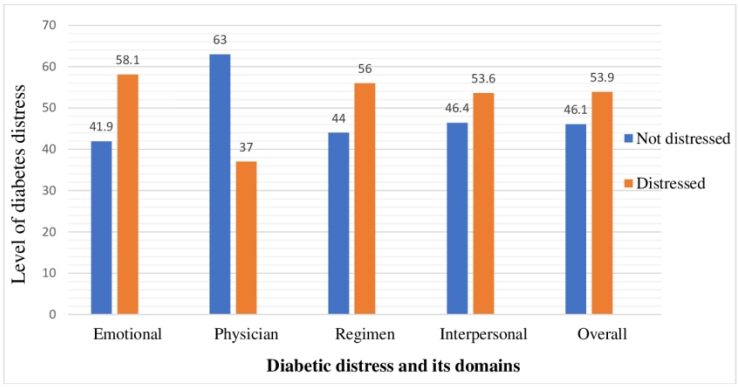

Figure 2 Prevalence of diabetes-related distress and its domains among study participants with type 2 diabetes mellitus attending hospitals in Southeast Ethiopia, 2023 (n = 856)

215x279mm (200 x 200 DPI)

Supplementary Table 1 Factors Associated with DRD Among Type 2 Diabetes Mellitus Patients Attending Hospitals in Southeast Ethiopia, 2023 (n = 856)

Variables	Diabetes Distress		COR with 95% CI	AOR with 95% CI
	Yes	No		
Age				
18-40	84(35.7%)	151(64.3%)	0.19(0.11,0.29)	1.35(0.55,3.31)
41-60	280(56.8%)	213(43.2%)	0.42(0.27,0.65)	1.95(0.88,4.31)
>=61	97(75.8%)	31(24.2%)	1	
Marital Status				
Married	331(51.5%)	312(48.5%)	0.29(0.15,0.58)	1.76(0.59,5.24)
Single	26(34.7%)	49(65.3%)	0.15(0.06,0.33)	2.16(0.58,7.96)
Divorced	64(73.6%)	23(26.4%)	0.77(0.34,1.74)	0.81(0.25,2.61)
Others	40(78.4%)	11(21.6%)	1	
Residence				
Rural	191(70.5%)	80(29.5%)	2.79(2.05,3.79)	0.753(0.38,1.48)
Urban	270(46.2%)	315(53.8%)	1	
Educational Status				
No formal education	181(80.8%)	43(19.2%)	9.54(4.77,19.07)	0.844(0.23,3.17)
Primary (1-8)	141(55.5%)	113(44.5%)	2.83(1.47,5.45)	0.565(0.18,1.82)
Secondary (9-12)	98(38.7%)	155(61.3%)	1.43(0.74,2.77)	0.511(0.16,1.59)
Diploma	26(34.2%)	50(65.8%)	1.18(0.55,2.55)	1.609(0.61,4.25)
Degree and above	15(30.6%)	34(69.4%)	1	
Occupation/employment				
Farmer	93(70.5%)	39(29.5%)	4.27(2.56,7.15)	1.66(0.57,4.86)
Merchant	320(54.2%)	270(45.8%)	2.12(1.44,3.13)	1.74(0.73,4.15)
Governmental	48(35.8%)	86(64.2%)	1	
Duration with diabetes				
<5	327(46.5%)	376(53.5%)	0.12(0.08,0.2)	0.63(0.29,1.39)

>5	134(87.6%)	19(12.4%)	1	
Other co-morbidities				
Present	252(84.3%)	47(15.7%)	8.93(6.26,12.74)	3.94(2.01,7.73) **
Absent	209(37.5%)	348(62.5%)	1	1
Treatment regiment				
Insulin or combination	174(64.2%)	97(35.8%)	1.86(1.39,2.51)	0.63(0.37,1.07)
Oral	287(49.1%)	298(50.9%)	1	
Hypoglycemia Event in the last 3 months				
Yes	156(66.4%)	79(33.6%)	2.05(1.49,2.79)	0.678(0.39,1.16)
No	305(49.1%)	316(50.9%)	1	
Education related to DM				
No	272(75.3%)	89(24.7%)	4.95(3.67,6.68)	1.588(0.99,2.55)
Yes	189(38.2%)	306(61.8%)	1	
Routine physical activity				
No	365(72.9%)	136(27.1%)	7.24(5.33,9.83)	2.22(1.36,3.63) **
Yes	96(27.0%)	259(73.0%)	1	1
Social support				
Poor	334(81.1%)	78(18.9%)	17.13(6.77,43.32)	4.41(1.62,12.03) *
Moderate	121(29.2%)	293(70.8%)	1.65(0.66,4.14)	1.31(0.49,3.52)
Strong	6(20.0%)	24(80.0%)	1	1
Taking alcohol				
Yes	101(83.5%)	20(16.5%)	5.26(3.19,8.68)	1.28(0.59,2.75)
No	360(49.0%)	375(51.0%)	1	
Smoking Status				
Yes	33(84.6%)	6(15.4%)	4.99(2.07,12.06)	1.31(0.33,5.18)

No	428(52.4%)	389(47.6%)	1	
Diabetes-related complications				
Present	119(88.1%)	16(11.9%)	8.24(4.79,14.17)	0.87(0.36,2.08)
Absent	342(47.4%)	379(52.6%)	1	
Glycemic Control				
Uncontrolled (≥130 mg/dl)	363(84.2%)	98(23.1%)	17.81(12.63,25.11)	2.36(1.35,4.12) *
Controlled (<130 mg/dl)	68(15.8%)	327(76.9%)	1	1
BMI (kg/m2)				
Normal	284(44.0%)	361(56.0%)	0.02(0.00,0.01)	0.16(0.02,1.42)
Overweight	135(80.4%)	33(19.6%)	0.09(0.01,0.73)	0.29(0.03,2.62)
Obesity	42(97.7%)	1(2.3%)	1	1

Note: AOR adjusted odds ratio, BMI = weight (kg)/height (m)2, CI confidence interval, COR crude odds ratio, * Variables significant with p-value≤0.005, ** Variables significant with p-value≤0.001.

Covariates adjusted for in the fully adjusted models: Age, marital status, residence, educational status, occupation/employment, duration with diabetes, other co-morbidities, treatment regiment, hypoglycemia Event in the last 3 months, education related to DM, routine physical activity, social support, taking alcohol, smoking status, diabetes-related complications, glycemic control, and BMI (kg/m2)

ANNEX I: Information sheet and Informed consent

Information sheet

Hello. My name is _____and I am a data collector of the study conducted by Mulugeta et al., Madda Walabu University academic staff, and researchers. Conducting this research entitled "*Diabetes*-Related Distress and its Associated Factors Among Type 2 Diabetes Patients Attending Follow-up Care at Bale and East Bale Zone Hospitals, Southeast Ethiopia*: a cross-sectional study".* We would very much appreciate your participation in this study. The interview takes between 10-20 minutes to complete. As part of the study, we would first like to ask you about socio-demographics then clinical factors, personal factors, and Diabetes-related distress (DRD). Whatever, information you provide will be kept strictly confidential, and will not be shared with anyone other than members of our research team. Participation in this survey is voluntary, and if we should come to any question you don't want to answer, just let me know and I will go on to the next question; or you can stop the interview at any time. However, we hope you will participate in the survey since your views are important.

At this time, do you want to ask me anything about the survey?

May I begin the interview now?

Signature of interviewer: ---------- Date: ---------/--------/--------

RESPONDENT AGREES TO BE INTERVIEWED - interview.

RESPONDENT DOES NOT AGREE TO BE INTERVIEWED - end.

For more information and questions here is the contact address of the principal investigator.

Mulugeta Adugnew (BSc, MSc)

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Consent form

I_____ am informed on the study to be conducted by Mulugeta et al., Madda Walabu University academic staff and researchers, "*Diabetes*-Related Distress and its Associated Factors Among Type 2 Diabetes Patients Attending Follow-Up Care at Bale and East Bale Zone Hospitals, Southeast Ethiopia*: a cross-sectional study".* Participation in this study is voluntary, with no obligation to answer any questionnaire, there is not any harm by not answering the questions and no special benefit by answering the question and the interview will take 10- 20 minutes. I heard all the information mentioned above and am willing to participate in the interview.

Name of interviewer_____ Signature_____

(Signature of interviewer certifying that respondent has given informed consent verbally)

Annex II: English Version Questionnaire

General information

For each question, make a circle around the spelling that corresponds to the answer; fill in the blanks with the answer of the respondent.

1. Participant's code number: _____

Part I: Socio-demographic characteristics

S.No	Question	Response	Remark
101	Age	_____	
102	Sex	1. Male 2. Female	
103	Marital status	1. Single 2. Married 3. Divorced 4. Widowed	
104	Residence	1. Urban 2. Rural	
105	Educational status	1. No formal education 2. Primary (1-8) 3. Secondary (9-12) 4. Diploma 5. Degree and above	
106	Patient occupation	1. Unemployed 2. Retired 3. Employed 4. Housewife 5. Merchant 6. Daily labor 7. Farmer 8. Student 9. Others	

Part II: Clinical-related history

SNO	Questions	Response	
201	Duration with diabetes	_____. Years	
202	Comorbidities	1. Yes 2.No 3. don't know	If NO go to Q 204
203	If you say yes for Q No 202 Which comorbidities, do you have	1. hypertension 2. nerve problem 3. kidney disease 4. heart problem 5. Other (specify) _____.	
204	Mode of current treatment	1. Insulin injection 2. Oral medication 3. both 4. lifestyle modification	
205	Hypoglycemia Event in the last 3 months	1. Yes 2. No	
206	Have you attended education related to diabetes	1. Yes 2. No	

Part III: Personal Factors

301	Routine physical activity	1. Yes 2. No	
302	How many people are so close to you that you can count on them if you have great personal problems?	1 'none' 2 '1–2' 3 '3–5' 4 '5+	
303	How much interest and concern do people show in what you do?	1 'none' 2 'Little'	

		3 'uncertain' 4 'some' 5 'a lot'	
304	How easy is it to get practical help from neighbors if you should need it?	1 'very difficult' 2 'Difficult' 3 'possible' 4 'easy' 5 'very easy'	
305	Do you have drink alcohol in the past one year?	1. yes 2. No	If No go to Q307
306	How many times do you consume alcohol?	1. Up to 4 times per month 2. More than 4 times per week	
307	Have you smoked a cigarette—even one puff—during the past SEVEN DAYS?	1. Yes 2. No	

Part IV: Questions related to Diabetes-related distress (DRD)

Directions: Living with diabetes can sometimes be tough. There may be many problems and hassles concerning diabetes and they can vary greatly in severity. Problems may range from minor hassles to major life difficulties. Listed below are 17 potential problems that people with diabetes may experience. Consider the degree to which each of the items may have distressed or bothered you DURING THE PAST MONTH and circle the appropriate number. Please note that we are asking you to indicate the degree to which each item may be bothering you in your life, NOT whether the item is merely true for you. If you feel that a particular item is not a bother or a problem for you, you would circle "1." If it is very bothersome to you, you might circle "6."

Problems	Not a	a slight	a Moderate	Somewhat A Serious	A Serious	A Very Serious

	Problem	Problem	problem	Problem	Problem	Problem
Emotional burden (ED)						
1. Feeling that diabetes is taking up too much of my mental and physical energy every day.	1	2	3	4	5	6
2. Feeling angry, scared, and/or depressed when I think about living with diabetes.	1	2	3	4	5	6
3. Feeling that diabetes controls my life.	1	2	3	4	5	6
4. Feeling that I will end up with serious long-term complications, no matter what I do.	1	2	3	4	5	6
5. Feeling overwhelmed by the demands of living with diabetes.	1	2	3	4	5	6
Physician-related distress (PD)						
6. Feeling that my doctor doesn't know enough about diabetes and diabetes care.	1	2	3	4	5	6
7. Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes.	1	2	3	4	5	6
8. Feeling that my doctor doesn't take my concerns seriously enough.	1	2	3	4	5	6
9. Feeling that I don't have a doctor who I can see regularly about my diabetes.	1	2	3	4	5	6
Regimen-related distress (RD)						
10. Feeling that I am not testing my blood sugars frequently enough.	1	2	3	4	5	6
11. Feeling that I am often failing with my diabetes regimen.	1	2	3	4	5	6
12. Not feeling confident in my day-to-day ability to manage diabetes.	1	2	3	4	5	6
13. Feeling that I am not sticking closely enough to a good meal plan.	1	2	3	4	5	6

14. Not feeling motivated to keep up my diabetes self-management.	1	2	3	4	5	6
Interpersonal Distress (ID)						
15. Feeling that friends or family are not supportive enough of my self-care efforts (e.g. planning activities that conflict with my schedule, encouraging me to eat the "wrong" foods).	1	2	3	4	5	6
16. Feeling that friends or family don't appreciate how difficult living with diabetes can be.	1	2	3	4	5	6
17. Feeling that friends or family don't give me the emotional support that I would like.	1	2	3	4	5	6

Part V: Clinical Parameters

401	Having diabetes complication	1. Yes 2.No	If yes 1. ---------- 2.---------- 3---------- 4---------- 5----------
402	Glycemic Control	1. Controlled 2. Uncontrolled	1. 2. 3.
403	Body Mass Index	1. Normal (18.5 -24.9) 2. Overweight (25-29.9) 3. Obese (>= 30)	

DABALATA I: Waraqaa odeeffannoo fi Hayyama odeeffannoo qabu

Waraqaa odeeffannoo

Akkam. Maqaan koo _____akkasumas odeeffannoo walitti qabaa qorannoo Mulugeta fi kkf, hojjettoota akaadaamii fi qorattoota Yunivarsiitii Madda Walaabuutiin gaggeeffamaa jiru ti.

mata duree qorannoo " *Dhiphina Dhukkuba Sukkaaraa* Waliin Walqabatee fi wantoota Waliin Walqabatan Dhukkubsattoota Dhukkuba Sukkaaraa Gosa 2ffaa Hospitaalota Baalee fi Zoonii Baalee Bahaatti Kunuunsa Hordoffii Irratti Argaman giddutti*" mata duree jedhuun qorannoo ni gaggessan.* Qo'annoo kana irratti hirmaannaan keessan baay'ee jajjabeefama. Af-gaaffiin kun xumuramuudhaaf daqiiqaa 10-20 fudhata. Akka qaama qorannichaatti jalqaba socio demographic sana booda clinical factors, Dhimmoota dhunfaa fi *Dhiphina Dhukkuba Sukkaaraa* Waliin Walqabatee (DRD) isin gaafachuu barbaanna . Waan fedhe haa ta'u, odeeffannoon isin kennitan iccitii cimaa ta'ee kan eegamu yoo ta'u, miseensota garee qorannoo keenyaa malee nama biraatiif hin qoodamu. Qorannoo kana irratti hirmaachuun fedhii ofiitiin kan raawwatamu yoo ta'u, gaaffii deebii kennuu hin barbaanne kamiyyuu yoo isin mudata ta'e naaf himaa gara gaaffii itti aanutti nan ce'a; ykn yeroo barbaaddetti Af-gaafii dhaabuu dandeessa. Haa ta'u malee yaadni keessan barbaachisaa waan ta'eef qorannoo kana irratti akka hirmaattan abdii qabna.

Yeroo kanatti waa'ee qorannoo kanaa waan gaafachuu barbaadduu qabduu?

Gaaffii fi deebii kana amma jalqabuu danda'aa?

Mallattoo gaafataa: ---------- Guyyaa: ----------/---------/---- -----

Deebii kennaan gaafiif waliigalee – Af-Gaafii

Deebii kennaan gaafiif walii hin galee - xumura

Odeeffannoo fi gaaffii dabalataaf teessoo quunnamtii qorataa muummee kunooti.

Mulugeetaa Adunyaawu(BSc, MSc).

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E-mail: mulugetaadugnew@gmail.com irratti ergaa

Unka hayyamaa

An _____ qorannoo Mulugeetaa fi kkf, hojjettoota akaadaamii fi qorattoota Yunivarsiitii Madda Walaabuutiin gaggeeffamuuf jiru, "Dhukkubsattoota *Dhukkuba* Sukkaaraa Gosa 2ffaa Hospitaalota Baalee fi Zoonii Baalee Bahaa, Kibba Baha Itoophiyaatti Kunuunsa Hordoffii irrati arkaman Keessatti Dhiphina Dhukkuba Sukkaaraa Waliin Walqabatee fi Qabxiilee Waliin Walqabatan Hospitaalota Baalee fi Zoonii Baalee Bahaa, Kibba Baha Itiyoophiyaa: *qorannoo qaxxaamuraa".* Qo'annoo kana irratti hirmaachuun fedhiini, gaaffii gaafataan kamiifuu deebisuuf dirqama hin qabu gaaffilee deebisuu dhiisuun miidhaa tokkollee akka hin qabnee fi gaafficha deebisuun faayidaa addaa hin qabu akkasumas af-gaaffiin daqiiqaa 10- 20 kan fudhatu ta'a. Odeeffannoo armaan olitti ibsame hunda dhaga'ee gaaffii fi deebii kana irratti hirmaachuuf fedhii qaba.

Maqaa gaafataa_____ Mallattoo_____ .

(Mallattoo gaafataa deebii kennaan hayyama beekumsa qabu afaaniin kennuu isaa mirkaneessu)

Gaaffii hikkaa afaan oromoo
Odeeffannoo waliigalaa

Tokkoon tokkoon gaaffiidhaaf, naannoo qubee deebii wajjin walsimutti geengoo tolchi; bakka duwwaa jiru deebii deebii kennaatiin guuti

1. Lakkoofsa koodii hirmaataa: _____ .

Kutaa I: Amaloota hawaas-dimoogiraafii

S.Lakk	Gaaffii	Deebii	Yaada
101.	Umurii	_____ .	
102.	Saala	1. Dhiira 2. Dhalaa	
103	Haala gaa'elaa	1. Qeenxee 2. Kan fuudhe 3. Kan hiikkaan 4. kan abbaan manaa/ haati manaa irraa du'e	
104.	Iddoo jireenyaa	1. Magaalaa 2. Baadiyyaa	
105	Haala barnootaa	1. Barnoota idilee hin qabu 2. Sadarkaa tokkoffaa (1-8) . 3. Sadarkaa Lammaffaa (9-12) . 4. Dippiloomaa 5. Digirii fi isaa ol	
106.	Hojii dhukkubsataa	1. Hojii dhabeeyyii 2. Soorama ba'e 3. Qaxarrii 4. Haadha manaa manaa 5. Daldalaa 6. Hojii guyyaa guyyaa 7. Qotee bulaa 8. Barataa 9. Kaan	

Kutaa II: Seenaa kilinikaala wajjin walqabatu

SNO	Gaaffilee	Deebii	
201	dhukkuba sukkaaraa akka qabdan eega bartan hagam geessan?	_____. waggoota	
202	Dhukkuboota waliin dhufan kan biraa qabdanii	1.Eeyyee 2.Lakk 3. hin beeku	Yoo LAKK ta'e gara G 204 deemaa
203	Yoo Q Lakk 202 eeyyee jette Dhukkuboota biroo kamtu, qabdaa	1.dhiibbaa dhiigaa 2.rakkina narvii 3.dhukkuba tiruu 4.rakkina onnee 5. Kan biroo (ibsi) _____.	
204	Haala wal'aansa ammaa	1. Insuliinii lilmoodhaan 2. Qoricha afaaniin fudhatamu 3. lamaan isaanii 4. fooyya'iinsa akkaataa jireenyaa	
205	ji'oota 3 darban keessatti taatee hirrina suukkaara dhiigaa	1.Eeyyee 2. Lakki	
206	Barnoota dhukkuba sukkaaraa wajjin walqabatu irratti hirmaattaniittuu	1. Eeyyee 2. Lakki	

Kutaa III: Qabxiilee Dhuunfaa

301	Sochii qaamaa idilee	1. Eeyyee 2. Lakki	
302	Nama bayyee sitti dhihaatu fi yeroo rakkoo isiniif qaqabu meeqa qabduu?	1 ' tokkollee hin jiru '. 2 ' 1 – 2 ' . 3 ' 3 – 5 ' . 4 ' 5+ ta'e	
303	Namoonni wanta ati hojjettuuf fedhii fi yaaddoo hangamii argisiisu?	1 ' tokkollee hin jiru '. 2 ' xiqqaa ' . 3 ' mirkanaa'aa hin taane '. 4 ' tokko tokko '. 5 ' baay'ee '.	
304	Gargaarsi qabatamaan si barbaachisuu yoo qabaate ollaa irraa argachuun hammam salphaadha?	1 ' baay'ee rakkisaa ' . 2 ' rakkisaa ' . 3 ' ni danda'ama ' . 4 ' salphaa ' . 5 ' baayyee salphaadha '.	
305	Waggaa tokko darbe keessatti alkoolii dhugdee?	1. eeyyee 2. Lakki	Yoo Lakki ta'e gara Q307 deemaa
306	Alkoolii yeroo meeqa dhugda?	1. Ji'atti hanga yeroo 4 2. Torbanitti yeroo 4 ol	
307	Guyyoota torba darban keessatti sigaaraa xuuxeettaa?	1. Eeyyee 2. Lakki	

Kutaa IV: Gaaffiiwwan dhiphina Dhukkuba Sukkaaraa wajjin walqabatan (DRD) .

Kallattii : Dhukkuba sukkaaraa wajjin jiraachuun yeroo tokko tokko cimaa ta'uu danda'a. Dhukkuba sukkaaraa ilaalchisee rakkoolee fi rakkinni hedduun jiraachuu waan danda'aniif hamma isaanii garaagarummaa guddaa qabaachuu danda'a. Rakkoon rakkina xixiqqoo irraa kaasee hanga rakkoo

jireenyaa gurguddaa ta'uu danda'a. Rakkoowwan namoota dhukkuba sukkaaraa qaban mudachuu danda'an 17 armaan gaditti tarreeffamaniiru. Meeshaaleen tokkoon tokkoon isaanii ji'a darbee keessatti hammam si dhiphisuu ykn si dhiphisuu danda'u ilaaliitii lakkoofsa barbaachisaa ta'etti naannessi. Hubadhaa, meeshaan sun siif qofa dhugaa ta'uu isaa miti osoo hin taane, tokkoon tokkoon meeshaan jireenya kee keessatti hammam akka si dhiphisuu danda'u akka agarsiiftu si gaafachaa jirra. Wanti murtaa'e tokko siif rakkina ykn rakkina akka hin taane yoo sitti dhaga'ame, "1" irratti marsita. Yoo baay'ee si dhibe, "6" naannessuu dandeessa.

Rakkoolee	Rakkoo Miti	Rakkoo xiqqoo	a Rakkoo giddu galeessaa	Hamma tokko Rakkoo Hamaa	Rakkoo Cimaa	Rakkoo Baay'ee Hamaa
Ba'aa miiraa (ED) .						
1. Dhukkubni sukkaaraa guyyaa guyyaan humna sammuu fi qaama koo garmalee fudhachaa akka jiru natti dhaga'ama.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
2. Dhukkuba sukkaaraa wajjin jiraachuu yeroon yaadu sarii, sodaa fi/ykn dhiphinni natti dhagahama.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
3. Dhukkubni sukkaaraa jireenya koo akka to'atu natti dhaga'ama.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
4. Waan fedhes hojjedhus, rakkoolee hamaa yeroo dheeraa na mudatannin akkan xumuru natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
5. Gaaffilee dhukkuba sukkaaraa wajjin jiraachuun namatti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
Dhiphina ogeessa fayyaatiin walqabatee dhufu (PD) .						
6. Doktarri koo waa'ee dhukkuba sukkaaraa fi kunuunsa dhukkuba sukkaaraa gahaa akka hin beekne natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
7. Akkaataa dhukkuba sukkaaraa koo itti to'adhu irratti hakiimni koo kallattii gahaa ifa ta'e akka naaf hin kennine natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
8. Doktarri koo yaaddoo koo akka waan guddaatti akka	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.

hin ilaalle natti dhaga'amuu.						
9. Doktara waa'ee dhukkuba sukkaaraa koo yeroo hunda argguu danda'u akkan hin qabne natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
Dhiphina sirna waliin walqabatee (RD) .						
10. Sukkaara dhiiga koo yeroo baayyee gahaa ta'ee akkan hin qoratne/madaalle natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
11. Yeroo baayyee sirna/goocha dhukkuba sukkaaraa koo irratti akkan kufaa jiru natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
12. Dandeettii dhukkuba sukkaaraa to'achuuf qabu guyyaa guyyaa irratti ofitti amanamummaa natti dhaga'amuu dhabuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
13. Karoora nyaataa gaarii tokkotti akkan hin maxxanne natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
14. dhukkuba sukkaaraa koo ofiif too'achaa itti fufuuf rakka'umsi natti dhaga'amuu dhabuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
Dhiphina Namoota Gidduu (ID) .						
15. Hiriyoonni ykn maatiin carraaqqii of kunuunsuu koo gahaa ta'ee akka hin deggerre natti dhaga'amuu (fkn sochiiwwan sagantaa koo wajjin wal faallessan karoorsuu, nyaata "dogongoraa" akkan nyaadhu na jajjabeessuu).	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
16. Hiriyoonni ykn maatiin dhukkuba sukkaaraa wajjin jiraachuun hammam rakkisaa ta'uu akka danda'u akka hin dinqisiifanne natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.
17. Hiriyoonni ykn maatiin deeggarsa miiraa ani barbaadu akka naaf hin kennine natti dhaga'amuu.	1. 1.	2. 2.	3. 3.	4. 4.	5. 5.	6. 6.

አባሪ I፡ የመረጃ ወረቀት እና በመረጃ የተደገፈ ስምምነት

የመረጃ ወረቀት

ሰላም. ስሜ _____ እባላለሁ እና ሙሉጌታ እና ሌሎች የመዳ ወላቡ ዩኒቨርሲቲ አካዳሚክ ሰራተኞች እና ተመራማሪዎች እያካሄዱት ባለዉ ጥናት ላይ መረጃ ሰብሳቢ ነኝ። " *ከስኳር በሽታ ጋር ተያያዥነት ያላቸው ችግሮች እና ተጓዳኝ ምክንያቶች ከሁለተኛው ዓይነት የስኳር ህመምተኞች መካከል* በባሌ እና በምስራቅ ባሌ ዞን ሆስፒታሎች በደቡብ ምስራቅ ኢትዮጵያ ክትትል የሚደረግባቸው የጤና እክሎች መካከል *" በሚል ርዕስ ጥናት ያካሂዳል።* በዚህ ጥናት ላይ ተሳትፎዎን በጣም እናደንቃለን። ቃለ መጠይቁ ለማጠናቀቅ ከ10-20 ደቂቃዎች ይወስዳል። እንደ ጥናቱ አካል፣ መጀመሪያ ሶሺዮ ዲሞግራፊ ከዚያም ክሊኒካዊ ሁኔታዎች፣ ግላዊ ሁኔታዎች እና ከስኳር በሽታ ጋር የተያያዘ ጭንቀት (DRD) ልንጠይቅዎ እንፈልጋለን ። ምንም ይሁን ምን፣ ያቀረቡት መረጃ በጥብቅ በሚስጥር ይጠበቃል፣ እና ከተመራማሪ ቡድናችን አባላት በስተቀር ለማንም አይጋራም። በዚህ የዳሰሳ ጥናት ውስጥ መሳተፍ በፈቃደኝነት ነው, እና እርስዎ መመለስ የማትፈልጉት ማንኛውም ጥያቄ ብናመጣ, አሳውቀኝ እና ወደ ቀጣዩ ጥያቄ እሄዳለሁ; ወይም በማንኛውም ጊዜ ቃለ መጠይቁን ማቆም ይችላሉ። ሆኖም፣ የእርስዎ እይታዎች አስፈላጊ ስለሆኑ በዳሰሳ ጥናቱ ላይ እንደሚሳተፉ ተስፋ እናደርጋለን።

በዚህ ጊዜ ስለ ዳሰሳ ጥናቱ የሆነ ነገር ልትጠይቀኝ ትፈልጋለህ?

ቃለ መጠይቁን አሁን ልጀምር?

የቃለ-መጠይቅ አድራጊ ፊርማ፡---------- ቀን፡---------- ----

ምላሽ ሰጪው ለመጠየቅ ተስማምቷል - ቃለ መጠይቅ

ምላሽ ሰጪው ለመጠየቅ አይስማማም - መጨረሻ

ለበለጠ መረጃ እና ጥያቄዎች የዋናው መርማሪ አድራሻ እዚህ አለ።

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የፍቃድ ቅፅ

“ *ከስኳር በሽታ ጋር* የተያያዘ ችግር እና ተያያዥ ምክንያቶች ከሁለተኛው ዓይነት የስኳር ህመምተኞች ክትትል በባሌ እና ምስራቅ ባሌ ዞን ሆስፒታሎች፣ ደቡብ ምስራቅ ኢትዮጵያ ስለሚካሄደው ጥናት መረጃ ተሰጥቻለሁ። በዚህ ጥናት ውስጥ መሳተፍ በፈቃደኝነት ነው, ለማንኛውም ጠያቂ መልስ የመስጠት ግዴታ የለበትም, ለጥያቄዎች መልስ ባለመስጠት ምንም ጉዳት የለውም እና ለጥያቄው መልስ በመስጠት የተለየ ጥቅም የለም, እንዲሁም ቃለ-መጠይቁ ከ10-20 ደቂቃዎች ይወስዳል. ከላይ የተጠቀሱትን መረጃዎች ሁሉ ሰማሁ እና በቃለ መጠይቁ ላይ ለመሳተፍ ፈቃደኛ ነኝ።

የጠያቂው ስም _____ ፊርማ_____

(የጠያቂው ፊርማ ምላሽ ሰጪው በመረጃ የተደገፈ ስምምነት በቃላት መስጠቱን የሚያረጋግጥ)

የአማርኛ ትርጉም መጠይቅ

ክፍል አንድ፡የቤተሰብ አጠቃላይ ማህበራዊ ሀኔታ

መመሪያ 1: ይህ ጥያቄ ስለ ዳራ መረጃ ነው. እባክዎን እያንዳንዱን የአረፍተ ነገር ንጥል ለእርስዎ የማንብለዎትን በጥሞና ያዳምጡ እና ከዚያ ምላሹን እና የወቅቱን ተገቢ መልስ የሚወክል አማራጭ ይንገሩኝ ።

1. የተሳታፊ ኮድ ቁጥር፡- _____

ክፍል አንድ፡- ማህበረ-ሕዝብ ባህሪያት

ተ.ቁ	ጥያቄ	ምላሽ	አስተያየት
101	እድሜ	_____	
102	ጸታ	1. ወንድ 2. ሴት	
103	የጋብቻ ሁኔታ	1 .ያገባ/ች 2. ያላገባ/ች 3. አግብቶ የፈታ/ች 4. የሞተበት/የሞተባት	
104	መኖሪያ ቦታ	1. ከተማ 2. ገጠር	
105	የትምህርት ደረጃ	1. መደበኛ ትምህርት የለም 2. የመጀመሪያ ደረጃ (1-8) 3. ሁለተኛ ደረጃ (9-12) 4. ዲፕሎማ 5. ዲግሪ እና ከዚያ በላይ	
106	የታካሚ ሥራ	1. ሥራ አጥ 2. ጡረታ ወጥቷል። 3. ተቀጣሪ 4. የቤት ሚስት 5. ነጋዴ 6. ዕለታዊ የጉልበት ሥራ 7. ገበሬ 8. ተማሪ 9. ሌሎች	

ክፍል II: ክሊኒካዊ ተዛማጅ ታሪክ

ተ.ቁ	ጥያቄዎች	ምላሽ	
201	የስኪር በሽታ እንዳለበዎት ካወቁ ምን ያህል ጊዜ ሆነዎት	_____. ዓመታት	
202	ሌላ ተጓዳኝ በሽታ አለበዎት	1. አዎ 2.አይ 3. አላውቅም	አይ ከሆነ ወደ ጥያቄ 204 ይሂዱ
203	ለ Q No 202 አዎ ካሉዎት የትኞቹ ተጓዳኝ በሽታዎች አሉዎት	1. የደም ግፊት 2.የነርቭ ችግር 3. የኩላሊት በሽታ 4.የልብ ችግር 5. ሌላ (ይግለጹ) _____.	
204	አሁን የሚወስዱት ሕክምና ዘዴ	1. የኢንሱሊን መርፌ 2. .በአፍ የሚወሰድ 3. ሁለቱም 4. የህይወት ዘይቤ ማሻሻያ	
205	ባለፉት 3 ወራት ውስጥ የደም ስኩር ማነስ ክስተት	1. አዎ 2. አይ	
206	ከስኪር በሽታ ጋር የተያያዘ ትምህርት ተከታትለዋል?	1. አዎ 2. አይ	

ክፍል III: የግል ምክንያቶች

301	መደበኛ የአካል ብቃት እንቅስቃሴ ያደርጋሉ	1. አዎ 2. አይ	
302	በጣም የሚቀርቡዎት እና በችግር ጊዜ የሚደርሱለዎ ሰዎች ስንት ይሆናለ?	1 ." ምንም " 2. ' 1-2 ' 3. ' 3 - 5 ' 4. ' 5+	
303	ሰዎች በምታደርገው ነገር ምን ያህል ፍላጎት እና አሳቢነት ያሳያሉ?	1 " ምንም " 2 " ትንሽ " 3 " ያልተረጋገጠ " 4 ' አንዳንድ ' 5 " ብዙ "	
304	ከጎረቤቶችዎ እርዳታ በሚፈሌጉበት ሰዓት የማግኘት አጋጣሚ?	1 " በጣም አስቸጋሪ " 2 " አስቸጋሪ " 3" ይቻላል " 4 " ቀላል " 5 ' በጣም ቀላል '	
305	ባለፈው አንድ አመት ውስጥ አልኮል ጠጥተዋል?	1. አዎ 2. አይ	ካልሆነ ወደ Q307 ይሂዱ
306	ምን ያህል ጊዜ አልኮል ትጠጣለህ?	1. በወር እስከ 4 ጊዜ 2. በሳምንት ከ 4 ጊዜ በላይ	
307	ላለፉት ሰባት ቀናት ሲጋራ አጨስሃል - አንድም ፑፍ - ባለፉት ሰባት ቀናት ውስጥ?	1. አዎ 2. አይ	

ክፍል IV፡ ከስኪር በሽታ ጋር የተዛመዱ ጥያቄዎች (DRD)

<u>መመሪያዎች</u> ፡- ከስኪር በሽታ ጋር መኖር አንዳንድ ጊዜ ከባድ ሊሆን ይችላል። የስኪር በሽታን በተመለከተ ብዙ ችግሮች ሊኖሩ ይችላሉ እና በክብደታቸው በጣም ሊለያዩ ይችላሉ። ችግሮች ከትንሽ ጣጣዎች እስከ ዋና የህይወት ችግሮች ሊደርሱ ይችላሉ። ከዚህ በታች የተዘረዘሩት 17 የስኪር በሽታ ያለባቸው ሰዎች ሊያጋጥሟቸው የሚችሉ ችግሮች ናቸው. ባለፈው ወር ውስጥ እያንዳንዱ መጠይቅ ምን ያህል እንዳስጨነቀዎት ግምት ውስጥ ያስገቡ እና ተገቢውን ቁጥር ይናገሩ ። እባኮትን እየጠየቅንዎት ያለው መጠይቁ ለእርስዎ ብቻ እውነት መሆን አለመሆኑን ሳይሆን እያንዳንዱ ነገር በህይወቶ የሚያስጨንቁዎትን ደረጃ እንዲጠቁሙ ነው። አንድ የተወሰነ ነገር ለእርስዎ የማይረብሽ ወይም ችግር እንደሌለው ከተሰማዎት “1”ን ይናገራሉ ። ለእርስዎ በጣም የሚረብሽ ከሆነ “6”ን መናገር ይችላሉ።

ችግሮች	ችግር አይሆንም	ትንሽ ችግር	መካከለኛ ችግር	በመጠኑ ከባድ ችግር	ከባድ ችግር	በጣም ከባድ ችግር
ስሜታዊ ሸክም (ED)						
1. የስኪር ህመም በየቀኑ ከመጠን በላይ የአዕምሮ እና የአካል ኃይሌን እየወሰደ እንደሆነ ይሰማኛል።	1	2	3	4	5	6
2. ከስኪር በሽታ ጋር ስለመኖር ሳስብ ንዴት፣ ፍርሃት እና/ወይም የመንፈስ ጭንቀት ይሰማኛል።	1	2	3	4	5	6
3 የስኪር ህመም ህይወቴን እንደሚቆጣጠረው ይሰማኛል።	1	2	3	4	5	6
4. ምንም ባደርግ በከባድ የረጅም ጊዜ ውስብስቦች እንደምጨርስ ይሰማኛል።	1	2	3	4	5	6
5 ከስኪር በሽታ ጋር የመኖር ፍላጎቶች ከመጠን በላይ የመጨናነቅ ስሜት።	1	2	3	4	5	6
ከሐኪም ጋር የተያያዘ ጭንቀት (PD)						
6. ዶክተሬ ስለ ስኪር በሽታ እና ስለ ስኪር በሽታ እንክብካቤ በቂ እውቀት እንደሌለው ይሰማኛል.	1	2	3	4	5	6
7. ዶክተሬ የስኪር በሽታዬን እንዴት መቆጣጠር እንዳለብኝ በቂ መመሪያዎችን እንደማይሰጠኝ እየተሰማኝ ነው።	1	2	3	4	5	6
8. ዶክተሬ ጭንቀቴን በበቂ ሁኔታ እንደማይመለከተው ይሰማኛል።	1	2	3	4	5	6

9. ስለ የስኳር ህመም አዘውትሬ የማየው ዶክተር የለኝም የሚል ስሜት ይሰማኛል።	1	2	3	4	5	6
ከአገዛዝ ጋር የተያያዘ ጭንቀት (RD)						
10. በደም ውስጥ ያለውን የስኳር መጠን በተደጋጋሚ በበቂ ሁኔታ እየመረመርኩ እንዳልሆነ ይሰማኛል።	1	2	3	4	5	6
11. በስኳር በሽታ በሚደረጉ ድርጊቶች ላይ ብዙ ጊዜ እየወድቅኩ እንደሆነ ይሰማኛል.	1	2	3	4	5	6
12 የስኳር በሽታን ለመቆጣጠር በዕለት ተዕለት ችሎታዬ በራስ የመተማመን ስሜት አይሰማኝም።	1	2	3	4	5	6
13. ከጥሩ የምግብ እቅድ ጋር በበቂ ሁኔታ እየሄድኩ እንዳልሆን ይሰማኛል።	1	2	3	4	5	6
14. የስኳር በሽታየን እየተንከባከብኩ ለመቀጠል ያለመነሳሳት ስሜት.	1	2	3	4	5	6
የእርስ በርስ ጭንቀት (ID)						
15. ጓደኞቼ ወይም ቤተሰቦቼ ለራሴ እንክብካቤ ጥረቴ በቂ ድጋፍ እንደማይሰጡኝ ይሰማኛል (ለምሳሌ ከፕሮግራሜ ጋር የሚቃረኑ ተግባራትን ማቀድ፣ “የተሳሳቱ” ምግቦችን እንድበላ ማበረታታት)።	1	2	3	4	5	6
16. ጓደኞች ወይም ቤተሰብ ከስኳር በሽታ ጋር መኖር ምን ያህል ከባድ እንደሆነ እንደማያደንቁ ይሰማኛል.	1	2	3	4	5	6
17. ጓደኞች ወይም ቤተሰቦች የምፈልገውን ስሜታዊ ድጋፍ እንደማይሰጡኝ ይሰማኛል።	1	2	3	4	5	6

Problems	Not a Problem	a slight Problem	a Moderate problem	Somewhat A Serious Problem	A Serious Problem	A Very Serious Problem
Emotional burden (ED)						
1. Feeling that diabetes is taking up too much of my mental and physical energy every day.	56(6.5%)	327(38.2%)	143(16.7%)	213(24.9%)	63(7.4%)	54(6.3%)
2. Feeling angry, scared, and/or depressed when I think about living with diabetes.	60(7.0%)	356(41.6%)	98(11.4%)	191(22.3%)	95(11.1%)	56(6.5%)
3 Feeling that diabetes controls my life.	79(9.2%)	341(39.8%)	97(11.3%)	168(19.6%)	105(12.3%)	66(7.7%)
4. Feeling that I will end up with serious long-term complications, no matter what I do.	84(9.8%)	375(43.8%)	63(7.4%)	160(18.7%)	105(12.3%)	69(8.1%)
5 Feeling overwhelmed by the demands of living with diabetes.	120(14.0%)	348(40.7%)	78(9.1%)	143(16.7%)	93(10.9%)	74(8.6%)
Physician-related distress (PD)						
6. Feeling that my doctor doesn't know enough about diabetes and diabetes care.	377(44.0%)	244(28.5%)	127(14.8%)	61(7.1%)	35(4.1%)	12(1.4%)
7. Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes.	308(36.0%)	261(30.5%)	139(16.2%)	70(8.2%)	45(5.3%)	33(3.9%)
8. Feeling that my doctor doesn't take my concerns seriously enough.	241(28.2%)	317(37.0%)	131(15.3%)	88(10.3%)	52(6.1%)	27(3.2%)
9. Feeling that I don't have a doctor who I can see regularly about my diabetes.	279(32.6%)	285(33.3%)	105(12.3%)	96(11.2%)	57(6.7%)	34(4.0%)
Regimen-related distress (RD)						
10. Feeling that I am not testing my blood sugars frequently enough.	139(16.2%)	319(37.3%)	96(11.2%)	194(22.7%)	60(7.0%)	48(5.6%)
11. Feeling that I am often failing with my diabetes regimen.	81(9.5%)	363(42.4%)	75(8.8%)	197(23.0%)	71(8.3%)	69(8.1%)
12 Not feeling confident in my day-to-day ability to manage diabetes.	63(7.4%)	384(44.9%)	66(7.7%)	176(20.6%)	92(10.7%)	75(8.8%)
13. Feeling that I am not sticking closely enough to a good meal plan.	58(6.8%)	363(42.4%)	91(10.6%)	162(18.9%)	89(10.4%)	93(10.9%)
14. Not feeling motivated to keep up my diabetes self-management.	102(11.9%)	324(37.9%)	88(10.3%)	160(18.7%)	86(10.0%)	96(11.2%)
Interpersonal Distress (ID)						
15. Feeling that friends or family are not supportive enough of my self-care efforts (e.g. planning activities that conflict with my schedule, encouraging me to eat the "wrong" foods).	102(11.9%)	323(37.7%)	85(9.9%)	159(18.6%)	92(10.7%)	95(11.1%)

16. Feeling that friends or family don't appreciate how difficult living with diabetes can be.	117(13.7%)	335(39.1%)	71(8.3%)	144(16.8%)	101(11.8%)	88(10.3%)
17. Feeling that friends or family don't give me the emotional support that I would like.	115(13.4%)	335(39.1%)	79(9.2%)	157(18.3%)	95(11.1%)	75(8.8%)

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	Predictors of Diabetes-Related Distress among people with Type 2 Diabetes in Southeast Ethiopia: cross-sectional study	1
		Out of the total 871 study participants planned,856 participated in the study with a response rate of 98.3% %. The findings showed that about 53.9 % (95% CI 50.4–57.2%) of the patients have Diabetes-Related Distress. Physical activity [AOR 2.22; 95% CI: 1.36–3.63], social support [AOR 4.41; 95% CI: 1.62–12.03], glycemic control [AOR 2.36; 95% CI: 1.35–4.12], and other co-morbidities [AOR 3.94; 95% CI: 2.01–7.73], were factors that significantly associated with diabetes-related distress at P< 0.05. Despite addressing Diabetes distress improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life, a substantial number of participants had Diabetes-related distress. Therefore, the identified predictors of DRD need to be a concern for health practitioners in the management of T2DM.	1-2
Introduction			
Background/rationale	2	Diabetes-related distress (DRD) is a unique emotional problem that is directly related to the diagnosis, the threat of complications, self-management, burdens, worries of living with T2DM, and concerns about support and access to care. DRD lowers the motivation for self-care, often leading to lowered physical and emotional well-being, poor diabetes control, poor adherence to medication, and increased mortality among individuals with diabetes. Addressing DRD improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life. It is therefore imperative to assess DRD among people living with diabetes mellitus (PWD) early and intervene in a timely manner. The American Diabetes Association (ADA) recommends people with diabetes should be routinely monitored for diabetes-related distress. However, from the review of the relevant literature, information regarding DRD is limited in Ethiopia. In addition, less is known about the factors that contribute to DRD and which could be targeted for intervention in the country.	3-5
Objectives	3	The aim of this study was to assess the prevalence of DRD and its associated factors among type 2 diabetes patients attending hospitals in Southeast Ethiopia.	5
Methods			
Study design	4	Institutional-based cross-sectional study design was conducted	5

		among Type 2 diabetic patients.	
Setting	5	Using institutional based cross-sectional survey, 871 adult Type 2 diabetic patients who have follow up and selected through simple random sampling method from Bale and East Bale zones public hospitals screened for DRD. The study was conducted from March to April 2023.	5
Participants	6	-All Type 2 adult diabetic patients at public hospitals in Southeast Ethiopia were source of population. - All Type 2 diabetic patients aged ≥ 18 years who have at least six months follow-up and come into diabetic clinics were used as criteria of inclusion, whereas individuals with gestational diabetes, patients who were unable to communicate, and newly diagnosed Type 2 DM patients were excluded from the study by reviewing their medical records. -Simple random sampling technique was used to identify the study unit to be included to the study.	6
Variables	6	***Dependent Variable*** Diabetes-related distress ***Independent Variables*** **Socio- Demographic Factors:** Sex, age, residence, marital status, educational status, occupation **Clinical Factors:** Duration with dm, comorbidities, mode of current treatment, hypoglycemia event in the last 3 months, education related to dm, dm related complications, glycemic control, body mass index. **Personal factors**: - Routine physical activity, social support, drinking alcohol, cigarette smoking.	7
Data sources/ measurement	8	To assure the quality of data, training was given for data collectors and supervisors about the aim of the study, data collection procedure and ethical issues. Validity was checked by doing pretest on 5 % of DM patients at Dodola Hospital (out of the study area). Modification of the tool was made based on the pretest result. For reliability test (Cronbach alpha value of 0.98) was performed to check the reliability of the questionnaire items. Close supervision was made during data collection. Data clean up and crosschecking was also done before analysis. Finally, multivariate analysis was run in the binary logistic regression model to control the confounding factors.	8
Bias	7	Pretest was done and training was given for data collectors	*8*
Study size	8	871	5-6
Statistical methods	9	Binary logistic regression was used for the analysis of outcome variable.	8

Results			
Participants	10	Out of the total 871 study participants planned,856 participated in the study with a response rate of 98.3% %. This study indicated that 481(56.2%) of the participants were male, the mean age of the participants was 48.6 ± 11.1 years, and 493 (57.6%) of them were in the range of 41-60 years. Of the respondents, 643 (75.1%) were married, 224 (26. 2%) had no formal education, 585 (68.3 %) were from the urban settings, 361 (42.2%) have not received education related to diabetes,501(58.5%) have not performed routine physical activities, and 412 (48.1%) had poor social support regarding living with diabetes. The majority 817 (95.4%) of the participants were nonsmokers, and 735 (85.9) had no history of alcohol consumption. -The study indicated that the mean duration of living with type 2 diabetes was 3.5±2.26 years with a minimum of 1 and a maximum of 20 years. Of the total study participants, 299 (34.9%) had other co-morbidities, and 135 (15.8%) developed diabetes-related complications. Regarding diabetic medications, 68.3% (585) of respondents were taking oral medication. The study also revealed that 431 (50.4%) of the study participants had poor glycemic control.	9
Main results	11	**Factors associated with self-care practices during bivariate logistic regression analysis.** Logistic regression analysis was conducted to identify factors associated with Diabetes-related distress. In the bivariate analyses, variables like the age of participants, marital status, residence, educational status, occupation, duration with diabetes, other co-morbidities, treatment regiment, hypoglycemia event in the last 3 months, education related to DM, routine physical activity, social support, taking alcohol, smoking status, diabetic related complication, glycemic control, and BMI were identified factors associated with DRD at P ≤0.2. **Multivariate logistic regression analysis for self-care practice** In multivariate analysis, routine physical activity [AOR 2.22; 95% CI: 1.36–3.63], social support [AOR 4.41; 95% CI: 1.62–12.03], glycemic control [AOR 2.36; 95% CI: 1.35–4.12], and other co-morbidities [AOR 3.94; 95% CI: 2.01–7.73], were factors that significantly associated with diabetes-related distress at P< 0.05.	10
Discussion			
Key results	12	The current study was conducted to assess the level of Diabetes-related distress and predictors among Type 2 diabetes patients in	10-12

		Southeast Ethiopia. The study showed that the overall prevalence of DRD (mean DDS-17 score≥2) was 53.9 % (95% CI 50.4–57.2%) of which most of the participants were screened positive for high DRD 358(41.8%). -Routine physical activity, social support, other co-morbidities, and glycemic control were found to be predictors of DRD. -Despite addressing Diabetes distress improves diabetes self-care, diabetes self-efficacy, glycemic control, and quality of life, a substantial number of participants had Diabetes-related distress especially emotional and regimen-related distress, which causes the required self-management of the disease more difficult and limited the patients' management of self-care activities necessary to manage diabetes.	
Limitations	13	Since the data on Diabetes-related distress were collected through self-reporting and therefore, there may be recall bias. The study also could not establish a cause-and-effect relationship between DRD and the independent variables due to its cross-sectional nature.	12
Interpretation	14	Generally, our findings reveal that a significant number of Type 2 diabetes patients had Diabetes -related distress. Routine physical activity, social support, other co-morbidities, and glycemic control were found to be predictors of DRD. The hospital administration should emphasize active screening for DRD, and it should be an integral part of diabetes care to successfully manage T2DM. Therefore, the identified predictors of DRD need to be a concern for health practitioners in the management of T2DM.	12
Other information			
Funding	15	Not applicable.	13