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RESEARCH ARTICLE

Anxiety disorder and its correlates among diabetic patients on follow up at Dilla University Referral Hospital, Gedeo Zone, Southern Ethiopia

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Abstract

Background: Anxiety is the most frequent emotional disorder occurring among patients with diabetes mellitus. Anxiety is mostly associated with poor adherence to diet, exercise, prescribed medication as well as poor glycemic control and greater risk of noncompliance to medication. Hence, this study was aimed to assess the prevalence and risk factors of anxiety among diabetic patients attending Dilla University Referral Hospital, Southern Ethiopia. This will be an input for the improvement of diabetic management particularly for the institution.

Methods: Institution based cross sectional study was conducted among 144 diabetic patients attending follow up at Dilla University Referral Hospital. Respondents were selected by simple random sampling from their record on the appointment logbook. Data were coded and entered in to SPSS version 20 for analysis. Odds ratios with their corresponding 95% confidence interval were used to indicate the strength of association.

Result: A total of 144 participants were studied, with a response rate of 100%. The overall prevalence anxiety was found to be 11.8%.Being female (AOR=2.13, CI (1.39, 3.29)), type 1 diabetes mellitus (AOR=1.98, CI (1.25, 3.14)), greater than five years duration of diabetes mellitus illness (AOR=2.70, CI (1.55, 4.68), chronic complication of diabetes mellitus (AOR=2.64, CI (1.66, 4.21)) and other additional chronic illness (AOR=2.45, CI (1.36, 4.41)) were significantly associated with anxiety among patients with diabetes mellitus in this study.

Conclusion: Anxiety has lower prevalence among patients with diabetes mellitus in this study compared to findings from other studies in similar setup. Being female, having type 1 diabetes mellitus, having chronic complication diabetes mellitus and other additional chronic co-morbidities were significantly associated with anxiety.

Keywords: Anxiety, Diabetes mellitus, Dilla University Referral Hospital

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Background

Diabetes is a chronic systemic disease virtually affecting almost every organ in the human system. According to World Health Organization, nearly 300 million people are estimated to suffer from diabetes by year 2025 [1]. Diabetes is a disease that affects the whole life of the patient like other chronic physical diseases and might lead to social or psychological adaptation problems. Diabetes Mellitus is a condition with psychiatric and psychosocial aspects besides being a physical disease, and a diabetic patient faces a range of physical, social and sexual problems [2].

Anxiety is defined as a feeling of worry, nervousness or unease about something with an uncertain outcome,whereas stress is a state of mental or emotional strain or tension resulting from adverse or demanding circumstances [3]. It is often a healthy response to a perceived threat. For most people,these feelings go away after the stressor has passed. For some people, the fear becomes so intense and long-lasting that it starts to impact on daily life, including work, school, relationships, and diabetes management [4].

Anxiety disorders are among the most prevalent psychiatric disorders among general population. In the US, over 28% of adults meet the criteria. Females are generally more likely than males to suffer from anxiety disorders.Among diabetic mellitus patients, anxiety is marked to be the most frequent emotional disorders [5].Diabetes mellitus almost doubles the risk of developing anxiety compared to general population.The degree and severity of the risk varies among different causes and conditions [6]. Anxiety and depression are widely prevalent among patients with diabetic complication like diabetic foot patients. Mental health status of those patients gets even worse among those suffering other comorbid diseases [7].

Few studies conducted in Ethiopia have shown that the coexistence of diabetes and psychiatric disorders is highly prevalent and remained as an important comorbid condition with diabetes. Particularly this conditions are associated with a number of debilitating conditions such as presence of diabetic complications, comorbidity, and the disease duration [8].

Coexistence of depression and DM becomes a grave challenge for the clinicians as both illnesses worsen the outcome of each other. Combination of depression and DM reduces overall quality of life, impairs self-management of diabetes, increases the risk of diabetic complications, and reduces overall life expectancy [9].

Anxiety is mostly associated with poor adherence to prescribed medication,diet, exercise and it also results in poor glycemic control during treatment.According to evidences from different literatures, anxiety is a major risk factor for non-adherence to medical therapy in many chronic diseases and the risk of non-compliance to medication is tripled among depressed diabetes patients [10].

The presence of undiagnosed anxiety among persons with this condition is a cause of concern since these symptoms make it difficult the initiation of treatment and allows frustration to build up in patients, thereby contributing to poor clinical outcomes [11]. Presence of anxiety symptoms significantly impairs the Health Related Quality of Life among those with diabetes mellitus patients [12].

In order to ensure an adequate quality of life, the multidimensional approach to manage diabetes mellitus should also take into consideration the mental health of these individuals and identifying the ones who are at risk of succumbing to the grave illness of depression [13].There are limited studies showing the level of the problem in the country in general and in the study area in particular. Taking in to consideration these realities, this study was planned to assess anxiety and its correlates among DM patients in Dilla University Referral Hospital (DURH), Southern Ethiopia to be an input for the improvement of

diabetic management.

Methodology

Study design and setting

Institution based descriptive cross sectional study was conducted at DURH from March 23 to May26, 2018. The study area is located at Gedeo zone, Southern Ethiopia, which is 360 km from Addis Ababa, the capital city of Ethiopia, and 90 km from Hawassa, the capital city of Southern Nations Nationalities and Peoples Region (SNNPR). DURH was established in 1985 as zonal hospital in Gedeo zone. It provides curative and rehabilitative services including diabetic care and management of psychiatric illnesses for about 2 million catchment populations.

Population

All diabetic mellitus patients who receive care in the hospital were used as source population diabetic mellitus patients who visited the hospital during the study period were included in the study. All diabetic mellitus patients of age 18 years and above who are currently receiving care and treatment for their diabetes status at DURH during the study period were included as a source population. The study population was randomly selected eligible DM cases from the source population. Those with severe illness and unable to communicate due to different health problems were excluded from the study.

Sample size determination

The Sample size determination is computed using single population proportion formula with the P = 50% (no comparable study identified)and assumption of critical value of z = 1.96 and degree of precision, d = 0.05 and expected non response rate of 10%.

Using the minimum sample size required, for finite population (N < 10,000) is:

$$n = \frac{Z^2 p(1-p)}{d^2}$$

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

Since the total population is less than 10,000, finite population formula was used

$$nf = \frac{n}{1+\frac{n}{N}}$$

$$nf = \frac{384}{1+\frac{384}{200}} = 131$$

N = total no of DM patient attending follow up at DURH
n = minimum sample size
nf = minimum final sample size

After adding 10% non-response rate, then the final sample size became144 individuals

Sampling and data collection procedure

The DM follow up charts was reviewed to recruit the eligible participants. From the chart review, a total of 200 cards of DM patients attending follow up at DURH were identified. From the records, the eligible participants were randomly selected from the chart using simple random sampling method. The patients were interviewed on their appointment and if the client missed the appointment and not come within a week of their specific appointment the next patient on the record were replaced. Data were collected with interviewer administered type of data collection method by trained nurses working in the hospital.

The tool for data collection was structured standardized questionnaire adapted from previous literatures. Anxiety was screened using hospital anxiety and depression scale (HADS) tool.

Based on the score obtained from the tool (ranging from 0 to 21), anxiety was dichotomized in to having (0 - 7) or not having (> 7) anxiety.

Data quality control

Data collectors were trained on the data collection tool and about the objective of the study. The consistency of data was maintained through translation of questionnaire in to local language. Pretest was also done to enhance the quality of data collection.

Data Processing and Analysis

The collected data were checked for completeness and inconsistency and they were cleaned. And then, they were entered into SPSS version 20 and analyzed. For descriptive analysis, frequency distribution, tables and statistical graphs were used. Binary logistic regression analysis was conducted to identify factors associated with anxiety among DM patients using odds ration with their corresponding.

Result

Socio-demographic characteristics

A total of 144 diabetic patients in the chronic follow up were participated in the study with the overall response rate of 100%. The mean age of participants was 47 years. Among the total participants of this study, little above half 84 (57.7%) were females and 98 (67.8%)were married. With regard to their education and occupation, 45 (31.2%) have attended primary school and 59 (40.4%) were farmers (Table 1).

Diabetes mellitus related characteristics and personal practices

Among the total participants, 100 (69.70%) were patients with type 2 DM and 98 (68.3%) of the respondents reported less than or equal to five years duration since diabetes diagnosis. Regarding DM complication, 33 (23.2%) of the study population had at least one chronic complication of diabetes mellitus and 25 (17.5%) of the respondents had at least one other additional chronic disease (Table 2).

Table 1 Socio-demographic characteristics of respondents (n=144) in Dilla University Referral hospital, Southern Ethiopia, May 2018.

Variable	Variable level	Frequency	Percentage
Age	< 30	14	9.7
	30-39	22	14.77
	40-49	34	23.6
	50-59	25	17.5
	> 60	49	34.55
Sex	Male	60	42.3
	Female	84	57.7
Religion	Orthodox	61	43
	Protestant	69	46.2
	Muslim	11	8
	Other	3	2.8
Ethnicity	Gedeo	119	85.3
	Amhara	15	10.4
	Other	10	4.3
Educational level	Illiterate	33	22.2
	Primary school	45	31.2
	Secondary school	28	19.6
	Diploma and above	38	27
Marital status	Married	98	67.8
	Single	20	14.4
	Divorced	10	6.6
	Widowed	16	11.1
Occupation	Government Employee	38	26.5
	Merchant	27	19.6
	Farmer	35	24.6
	House wife	29	18.9
	Other	15	10.4
Income	< 500	35	24.8
	500-1000	33	22.5
	1000-1500	39	27.4
	> 1500	37	25.3

Table 2 Diabetic Mellitus related characteristics of patients with diabetes mellitus on- follow up at Dilla University Referral hospital, Southern Ethiopia, 2018.

Variable	Variable level	Frequency	Percentage
Type of DM	T1DM	44	30.3
	T2DM	100	69.7
Duration of illness	$\leq$ 5 years	98	68.3
	$>$ 5 years	46	31.7
Chronic complication of diabetes	Yes	34	23.2
	No	110	76.8
Additional chronic disease	Yes	25	17.5
	No	119	82.5

Among the chronic illnesses among DM clients attending follow up at Dilla University Referral Hospital, about 12% have anxiety.

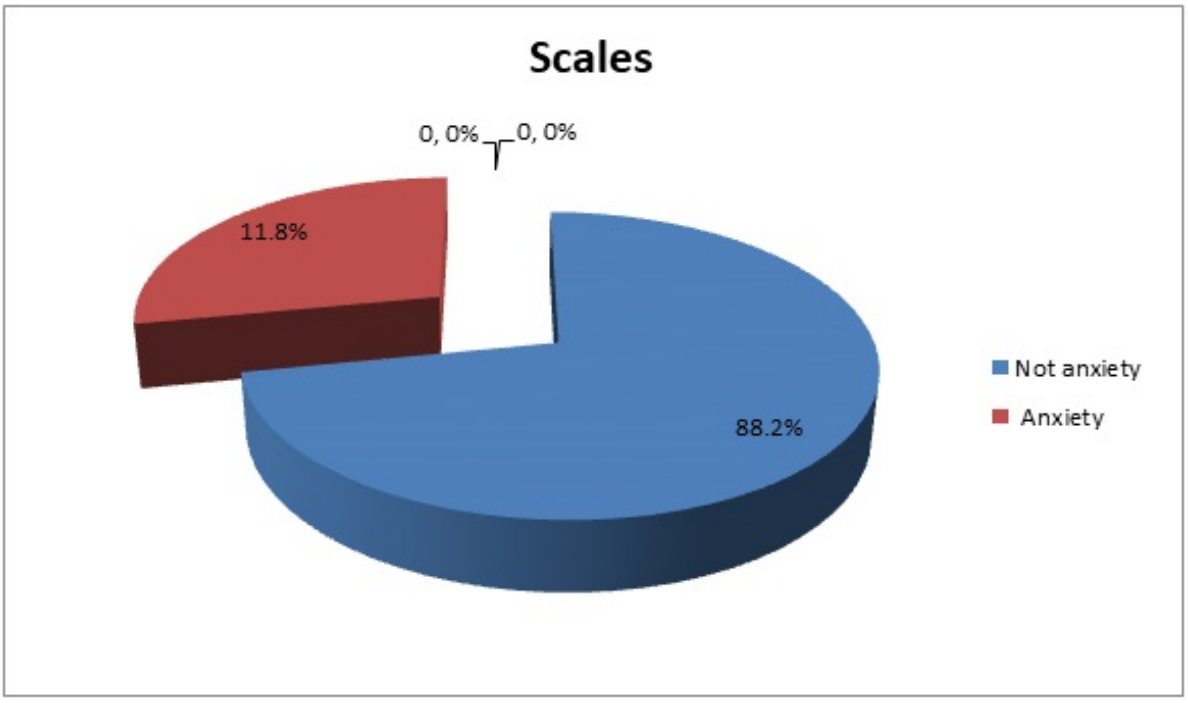

Figure 1 Prevalence of anxiety among Patients with diabetes mellitus on follow up at Dilla University Referral hospital, Southern Ethiopia, 2018.

Regarding substance use history among the study participants, 14 (10.2%) of them reported history of current use of alcohol, 3 (1.4%) of them currently use chat and 3 (1.4%) currently use of tobacco.

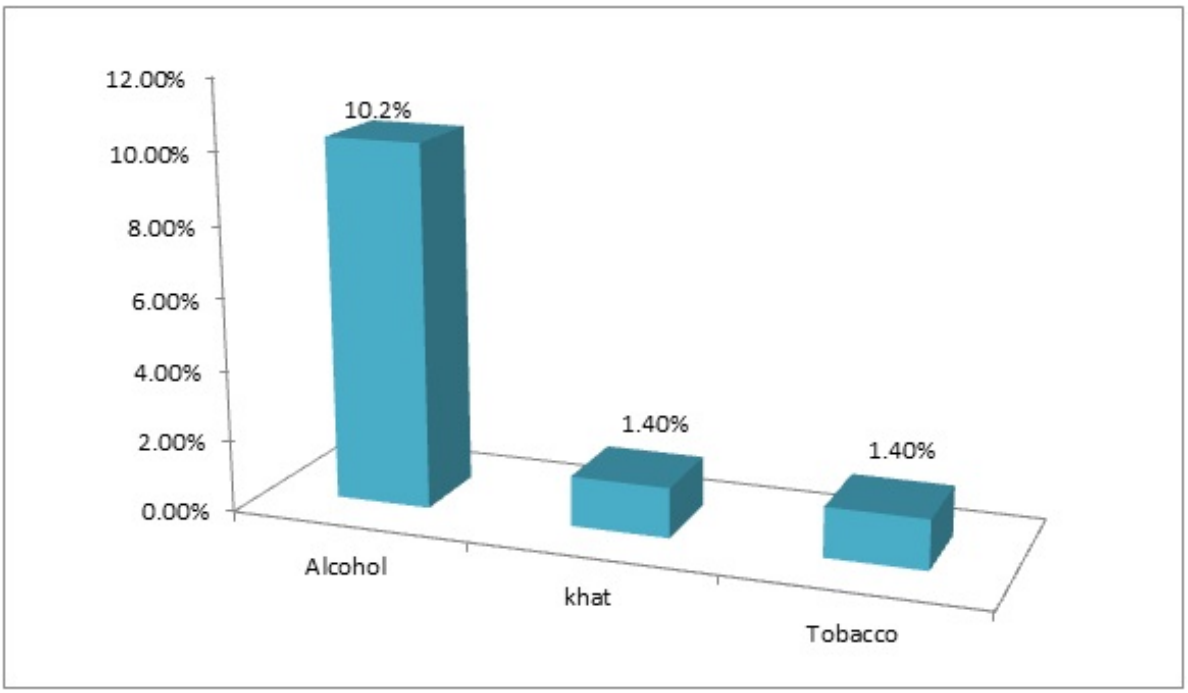

Figure 2 Distribution of substance use among diabetes patients on follow up at Dilla University Referral hospital, Southern, Ethiopia 2018.

Factors associated with Anxiety among diabetes mellitus

Logistic regression analysis was done to assess factors associated with anxiety among chronic diabetes mellitus patients. From the result, sex of the respondent, type of diabetes, duration of illness, having at least one chronic complication and other additional chronic disease were among the factors significantly associated with anxiety.

Regarding the association of sex with anxiety, female DM patients were two times more likely to have anxiety compared to male patients [AOR=2.13, 95% CI (1.39,3.29)]. Concerning the type of diabetes mellitus, patients with type II diabetes mellitus were also about two times [AOR=1.98, 95% CI (1.25, 3.14)] more likely to have anxiety as compared to those who were with type I diabetes mellitus.

In addition, duration of diabetic diagnosis and presence of any diabetic complication were also significantly associated with anxiety. In this regard, patients who were diagnosed as diabetic before five years were 2.6 times [AOR=2.64, 95% CI (1.66,4.21)] and those who have chronic complication of diabetes were 2.5 times [AOR=2.53, 95% CI (1.51,4.24)] more likely to have anxiety. Similarly, patients having other additional chronic illness were about two and half times [AOR=2.45 95% CI (1.36, 4.41)]more likely to develop anxiety when compared to those who have no any other chronic illnesses (Table 3).

Table 3 Factors associated with anxiety among patients with diabetes mellitus on follow up at Dilla University Referral Hospital Southern Ethiopia, 2018

Variable	Variable level	Anxiety		AOR 95% CI
		Yes	No	
Sex	Male	20	40	1.00
	Female	44	40	2.13 (1.39, 3.29)
Age	< 30	3	10	1.00
	30-39	10	11	2.72 (0.14, 6.5)
	40-49	14	20	2.15 (0.95, 4.88)
	50-59	9	16	1.89 (0.8, 4.43)
	≥ 60	27	23	3.66 (0.67, 8.00)
Marital status	Married	39	59	1.00
	Single	10	11	1.42 (0.81, 2.47)
	Divorced	5	4	1.95 (0.89, 4.28)
	Widowed	9	8	1.59 (0.86, 2.94)
Educational level	Illiterate	14	17	1.15 (0.66, 1.99)
	Primary school	20	25	1.16 (0.69, 1.99)
	Secondary school	13	16	1.26 (0.71, 2.24)
	Diploma and above	16	23	1.00
Occupational status	Employed	15	22	1.00
	Merchant	14	15	1.33 (0.75, 2.34)
	Farmer	16	19	1.17 (0.68, 2.02)
	House wife	13	14	1.35 (0.75, 2.43)
	Other	5	11	0.73 (0.36, 1.49)
Income	< 500	15	20	1.28 (0.75, 2.18)
	500-1000	16	18	1.31 (0.75, 2.26)
	1000-1500	18	19	1.49 (0.88, 2.54)
	> 1500	14	24	1.00
Current alcohol use	Yes	4	7	1.32 (0.73, 2.57)
	No	56	73	1.00
Types of DM	TI DM	16	28	1.00
	TII DM	40	60	1.98 (1.25, 3.14)
Duration of illness	≤ 5 years	31	64	1.00
	> 5years	29	16	2.64 (1.66, 4.21)
Presence of chronic complication	Yes	22	11	2.53 (1.51, 4.24)
	No	42	69	1.00
Presence of other chronic disease	Yes	17	9	2.45 (1.36, 4.41)
	No	47	71	1.00

Discussion

This study has attempted to identify the prevalence of anxiety and associated factors among patients with diabetes mellitus attending follow up at Dilla University Referral Hospital, Southern Ethiopia. The overall prevalence of anxiety in this study was found to be 11.8%.The prevalence of anxiety in this study is almost comparable to with the study conducted in Malaysia (11.5%) [14]. However, this finding is much lower than 44.2% prevalence from study conducted in Ambo General Hospital [11], 37.7% prevalence from study conducted in Jordan [7], 43.6% prevalence of study conducted in Qassim region in KSA [15], 57.9% in Karachi Pakistan [11]. This difference of prevalence might be due to the difference in study area and also the difference in method of assessment of anxiety.

Regarding factors associated with anxiety in this study, female patients were more likely to develop anxiety compared to males and this finding is supported with findings from Ambo, Ethiopia [16], Bingol State Hospital, Turkey [2], and Pakistan [13,17].

Type of DM was another factor associated with anxiety. From the result, patients with T2DM were about 2 times more likely to have anxiety when compared to T1DM. Similar finding was obtained from study in Iran [18] and Pakistan [19].

On the other hand, those who reported greater than five years duration of the illness were about 2.6 times more likely to have depression when compared to those who reported less than or equal to five years duration of the illness. This finding is in line with study done in Ambo, Ethiopia [16], Jordan [7], Qatar [20] and Pakistan [13]. The possible reason might be the lengthy year of medication might be associated with the development of anxiety and also as duration of disease increases, the disease is known to significantly increase the risk of developing diabetic complications. However, long duration of diabetes of more than 10 years from study conducted in KSA revealed less likely occurrence of anxiety [15]. This difference might be the case since the patients might adapt to the disease characteristics after long period of living with the disease. In addition, there might be better care in KSA that prevents development of complication.

Having at least one chronic complication was significantly associated with anxiety. Participants who had at least one chronic complication were about 2.5 times at higher risk of anxiety. This finding also comply with the study done in Ambo, Ethiopia [16], and Pakistan [13].

Similarly, in this study, having other chronic illness increased the risk of anxiety by 2.5 times when compared to those who have not reported other additional chronic illness. Similar findings were identified from study conducted in Penang and Melaka states of Malaysia [21] Jordan [7] and Karachi, Pakistan [22,13]. This finding might be reflecting the fact that the likelihood of anxiety increases with development of complications and other additional chronic illness among people with diabetes mellitus.

In general, anxiety has found to have lower prevalence among patients with diabetes mellitus in this study compared to other studies including those in Ethiopia. Being female, Patients with T1DM, greater than five years duration of illness, at least one chronic complication of diabetes and at least one additional other chronic disease like hypertensive and ischemic heart disease were significantly associated with anxiety. Hence during management of diabetic mellitus mental health problem should be taken into consideration particularly for those female patients, patients with longer duration of DM, those with diabetic complications and other co-morbidities.

Assertions

Abbreviations

AOR	Adjusted Odds Ratio
CI	Confidence Interval
DM	Diabetes Mellitus
DURH	Dilla University Referral Hospital
HADS	Hospital Anxiety and Depression Scale
SNNPR	Southern Nations Nationalities and peoples Region
SPSS	Statistical Package for Social Science
T1DM	Type 1 Diabetes Mellitus
T2DM	Type 2 Diabetes Mellitus

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Ethical concern
Ethical approval was obtained from Dilla University College of medicine and health science institutional review board. Written consent was obtained from the participants. Data was collected after assuring of confidentiality (anonymity and not writing the address).

Consent for publication: not applicable

Availability of data and materials: The datasets underlying the study are available from the corresponding author

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MF, RM, RK involved on conceptualization, data curation, analysis, result writing, editing, Investigation, Methodology, Project administration, Resources, Software, Supervision

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