



Diabetes Related Distress, Stigma and Self-Care Activities Among Patients with Diabetes in Assiut University Hospital

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ABSTRACT

Background: Diabetes distress (DD) is a significant barrier to effective self-care and diabetes management. **Objective:** To estimate the frequency of DD among patients with diabetes at Assiut University Hospital (AUH) and identify potential predictors and to explore the relationship between DD and diabetes-related stigma, and self-care activities. **Method:** A cross-sectional study was conducted on 295 patients with diabetes at AUH. Data were collected using questionnaires on sociodemographic and clinical characteristics, DD, diabetes-related stigma, and self-care activities. **Results:** The average age of the patients was 53.9 ± 9.6 years, with the majority being female (85.5%). The mean duration of diabetes was 9.34 ± 5.7 years. About two-thirds of the patients had uncontrolled diabetes (67.1%). Nearly half (47.8%) of participants experienced moderate to high levels of DD, while 52.2% reported little or no DD. The highest level of DD was regimen-related among 49.5% and the lowest was emotional burden among 13.6%. Statistically significant associations were found between DD and age, marital status, treatment type, hypertension, nephropathy, HbA1c levels, and stigma scale. In the adjusted logistic regression model, the predictors of moderate or high levels of DD included being 40-60 years, married, hypertensive, having nephropathy, experiencing a high level of stigma, and having elevated HbA1c levels. **Conclusions:** High degree of DD was found to be linked with high levels of HA1c level and a higher perception of diabetes-related stigma. Screening for DD, and diabetic stigma together with tailoring self-care activities should be principal components of diabetes management protocols.

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INTRODUCTION

Diabetes distress (DD) describes the emotional state where patients encounter feelings of anxiety, blame, or rejection that arises from surviving with diabetes mellitus and the demands of self-management and related health risks. It was described as the potential negative psychological reaction to the diagnosis, complications, self-management needs of diabetes, and the lack of support from personal relations, including healthcare workers.¹

DD adds extra challenges for both patients and the healthcare system.

Increased distress has been associated with poor self-management, lower medication compliance, inadequate glycemic control, more frequent complications, and a decreased quality of life.²

Furthermore, patients with diabetes experiencing DD reported higher levels of family conflict, more frequent interactions with the healthcare system, and a greater incidence of diabetes complications. They also face a higher risk of mortality from any cause over time compared to those without elevated levels of distress.³

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Table 1: Sociodemographic and clinical characteristics of patients with diabetes, AUH, 2024 (N=295)

Characteristics	N	%
Age (years)		
Mean±SD (range)	53.6±9.6 (32-80)	
< 40	41	13.9
40-60	181	61.4
> 60	73	24.74
Sex		
Female	253	85.8
Male	42	14.2
Residence		
Rural	255	86.4
Urban	40	13.6
Education		
Illiterate	248	84.1
Educated	47	15.9
Marital status:		
Married	278	94.2
Not married	17	5.8
Disease duration (years)		
Mean±SD (range)	9.34±5.7 (1-30)	
< 5 years	88	29.8
5-10 years	112	38.0
>10 years	95	32.2
Treatment type		
Oral	177	60.0
Insulin	94	31.9
Both	24	8.1
HbA1c		
Mean±SD	8.85±2.01	
Controlled (HbA1c < 7)	97	32.9
Uncontrolled (HbA1c ≥ 7)	198	67.1
Co-morbidities		
Hypertension	176	59.7
Cardiac disease	52	17.6
Obesity	166	56.3
Complications		
No complications	21	7.1
Neuropathy	189	64.1
Retinopathy	40	13.6
Hyperglycemia	24	8.1
Nephropathy	11	3.7
Hypoglycemia	5	1.7
Diabetic foot	5	1.7

Data were expressed as frequency (percentage), unless mentioned otherwise. SD, standard deviation

Multiple systematic reviews of intervention studies highlight the widespread prevalence of DD, which can negatively impact emotional well-being, self-care, and effective diabetes management. Consequently, many national guidelines advocate for the regular

monitoring of DD as part of routine clinical care.⁴ A 2017 meta-analysis found that around 36% of people with type 2 diabetes experience substantial levels of DD.⁵

The American Diabetes Association recommends screening for DD using standardized instruments at the first appointment of a diabetic patient, at regular periods, and whenever there is a change in the complaint, medication, or life conditions. Additionally, the association advises physicians to assess DD, particularly in patients who have not reached their glycemic control targets despite receiving appropriate therapy and experiencing related chronic complications.⁶ DD can be efficiently addressed through behavioral procedures, making it a favorable focus for involvements aimed at improving both emotional well-being and diabetes-related health effects.⁷

Diabetes stigma involves the negative emotions of self-guilt, disgrace, and social elimination faced by diabetics, as they are frequently labeled and devalued due to their condition.⁸ A new global study found that 19.2% of individuals with diabetes reported suffering from discernment.⁹ People with diabetes often perceive or encounter different levels of stigma and emotional distress. A meta-analysis highlighted a significant association between stigma and psychological distress among those with diabetes.¹⁰

Managing diabetes necessitates substantial changes in diet and lifestyle, supported by the healthcare team, to help patients build self-confidence and effectively alter their behavior. Ongoing follow-ups with healthcare providers are essential for maintaining a metabolic monitor and preventing long-standing obstacles.¹¹

Self-care is strongly associated with DD, as 37% of patients who engage in lower levels of self-care report experiencing high levels of distress. Participating in self-care activities can help with the rapid identification and controlling of DD, and continuous self-care learning appears to be effective in lowering its effect.¹²

The current study was motivated by the lack of recent research on the occurrence of DD among the type 2 diabetes population in Egypt. The primary aim was to measure the prevalence of DD among patients with diabetes at Assuit University Hospital (AUH) and identify its predictors. Additionally, to explore the relationship between DD and diabetes-related stigma, and self-care activities.

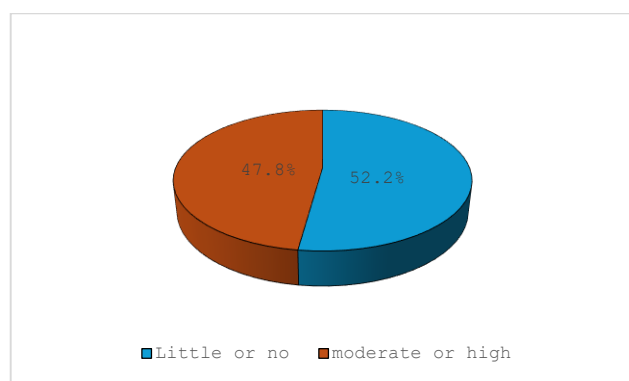


Figure 1: Level of distress among patients with diabetes, AUH, 2024

METHODS

A cross-sectional study was conducted among patients with type 2 diabetes attending the diabetes outpatient clinic at AUH.

The study included all patients with diabetes over the age of eighteen, of both sexes, who had been diagnosed with type 2 diabetes at least one year prior. Patients with gestational diabetes, severe mental illness or cognitive impairment (any condition that could prevent them from completing the interview) were excluded from participation.

The study participants involved 295 patients with type 2 diabetes.

Table 2: Average score of the Diabetes Distress Scale, Diabetes Stigma Assessment Scale and Diabetes Self-care Activities among the patients with diabetes, AUH, 2024

Diabetes distress scale	Mean±SD (%)
Overall	31.7±12.7
Physician related distress	7.2±4.6 (32.2)
Regimen related distress	11.08±7.1 (49.5)
Interpersonal distress	5.8±4.2 (35.6)
Emotional burden	6.9±3.7 (13.6)
Diabetes stigma scale	
Overall	80.4±12
Treated differently	26.5±4.4
Blame and judgement	31.5±3.5
Self-stigma	27.2±3.1
Diabetes self-care activities scale	
Overall	31.34±11
Diet	19.1±6.8
Exercise	3.9±1.9
Blood glucose testing	3.6±1.8
Foot care	4.8±3.5

Data were expressed as mean and standard deviation (percentage).

The sample size was calculated using the EPI Info, Version 7.2.01. The estimation was based on parameters from a previous study that reported a prevalence of severe DD of 13.4%,¹³ a confidence interval of 95% and a margin of error of 5%. The sample size was 179 patients with diabetes and after adding 10% as nonresponse rate it will be raised to be at least two hundred cases. Non-probability (convenience sample) technique was used to recruit the participants.

Data collection: Data were collected using a structured interviewer administered questionnaires in Arabic language. It included four tools:

Tool I: Socio- demographic and clinical data of patients with diabetes: It was developed by researchers to gather the required data from patients with diabetes and consisted of two parts. First part: personal and socio- demographic data as age, sex, level of education, residence and marital status. Second part: Diabetes-related characteristics such as the duration of disease, comorbidities, presence of diabetes complications, level of HA1c, body mass index and treatment modality.

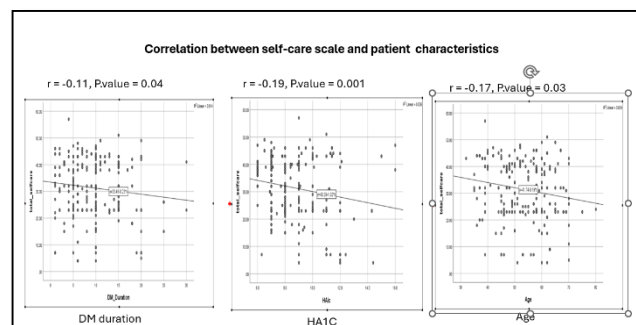
Tool II: The Arabic version of the Diabetic Distress Scale -17 (DDS- 17) is used to evaluate DD across four different domains: emotional burden (5 items), physician-related distress (4 items), regimen-related distress (5 items), and interpersonal distress (3 items). Answers to each item are measured on a 6-point occurrence scale, where 1 = "not a problem," 2 = "a slight problem," 3 = "a moderate problem," 4 = "somewhat serious problem," 5 = "a serious problem," and 6 = "a very serious problem." Based on the average item record, which indicates the degree of distress, the following cut-off points were established: little/no distress: < 2, moderate distress: 2 - 2.9, and high distress: ≥ 3.¹⁴ The Arabic version of the DDS- 17 is a valid and reliable instrument in measuring DD amongst Arabic speaking population (Cronbach's alpha = 0.8).¹⁵

Tool III: The Arabic version of the Type-2 Diabetes Stigma Assessment Scale (DSAS-2) is a dependable and valid self-report tool for measuring diabetes-related stigma. The scale consists of 19 items, categorized into three domains: "treated differently," "blame and judgment," and "self-stigma." Participants assess their level of agreement with each statement using a 5-point scale, from "strongly disagree" to

Table 3: Association between diabetes related distress and patients' characteristics, diabetes-related stigma, and self-care activities, AUH, 2024.

	Diabetes related distress		p-value
	Little or no (n= 154)	Moderate or high (n= 141)	
Age (years)			
< 40	17 (41.5%)	24 (58.5%)	0.022
40-60	106 (58.5%)	75 (41.4%)	
> 60	31 (42.5%)	42 (57.5%)	
Sex			
Female	133 (52.6%)	120 (47.4%)	0.758
Male	21 (50%)	21 (50%)	
Marital status			
Married	140 (50.4%)	138 (49.6%)	0.01
Not married	14 (82.4%)	3 (17.6%)	
Residence			
Urban	25(62.5%)	15(37.5%)	0.16
Rural	129(50.6%)	126(49.4%)	
Education			
Illiterate	128 (51.6%)	120 (48.4%)	0.863
Educated	26 (55.3%)	21 (44.7%)	
Treatment type			
Oral	96 (54.2%)	81 (45.8%)	0.012
Insulin	40 (42.6%)	54 (57.4%)	
Both	18 (75%)	6 (25%)	
Disease duration			
<5 years	46 (52.3%)	42 (47.7%)	0.774
5-10 years	61 (54.5%)	51 (45.5%)	
>10 years	47 (49.5%)	48 (50.5%)	
Comorbidity			
Hypertension	83(47.4%)	93(52.8%)	0.035
Cardiac disease	22 (42.3%)	30 (57.7%)	0.115
Obesity	94 (56.6%)	72 (43.4%)	0.155
Complications			
Nephropathy	2 (18.2%)	9 (81.8%)	0.021
Neuropathy	105(55.6%)	84(44.4%)	0.124
Retinopathy	25 (62.5%)	15 (37.5%)	0.161
HA1c	8.5±1.7	9.1±2.3	0.01*
Diabetes stigma scale	78.5±13.8	82.4±9.1	0.004*
Diabetes selfcare scale	30.3±10.8	32.4±11.2	0.102*

p-value was calculated using Chi-square. * p-value was calculated using independent sample t test.

**Figure (2): Correlations of selfcare activities scale and some of patients' characteristics, AUH, 2024.**

"strongly agree." The "treated differently" subscale includes six items, the "blame and judgment" subscale contains seven items, and the "self-stigma" subscale has six items. Scores for each subscale are derived by summing the individual items, with higher scores indicating greater stigma. The full English version of 19-item scale demonstrates excellent internal consistency, with a high Cronbach's alpha of 0.95.¹⁶

Table 4: Logistic regression analysis of predictors of diabetes distress among patients with diabetes, AUH, 2024

	Reference	Odds ratio	95%CI		p-value
			Lower	Upper	
Age (years)					
Age < 40 years	> 60	1.19	0.51	2.76	0.67
Age 40-60 years	> 60	0.536	0.29	0.98	0.04
Married	Unmarried	6.10	1.59	23.41	0.008
Treatment type					
Insulin	Oral	1.36	0.75	2.4	0.3
Both	Oral	0.3	0.13	1.08	0.7
Hypertension	No	1.98	1.16	3.39	0.01
Nephropathy	No	5.13	1.03	25.37	0.04
Stigma	No	1.03	1.01	1.06	0.001
HA1c		1.17	1.02	1.34	0.01

CI: confidence interval. R Square = 0.214

The Arabic translation of the 19-item DSAS-2 is a compelling and consistent instrument for evaluating recognized and suffered stigma in Arabic-speaking adults with type 2 diabetes (Cronbach's alpha = 0.94).¹⁷

Tool IV: The Arabic version of the Summary of Diabetes Self-care Activities (SDSC-A) is a self-report instrument that evaluates the self-care behaviors of individuals with diabetes through 11 items, addressing exercise, glucose testing, general diet, specific diet, foot care and smoking. Every single item is scored on a scale from 0 to 7, reflecting how frequently the patient has engaged in self-care activity over the past 7 days, with the total score ranging from 0 to 77. The tool includes 4 items on nutrition, 2 items on exercise, 2 items on blood glucose testing, 2 items on foot care, and 1 item on smoking. An average score is computed for each of the five domains (diet, exercise, blood glucose monitoring, foot care, and treatment compliance) where higher marks indicate improved diabetes self-management.¹⁸ The Arabic translation of the SDSC-A has demonstrated adequate reliability and validity for application in Saudi Arabia and is also appropriate for application in other Arabic-speaking populations, with a Cronbach's alpha of 0.76.¹⁹

Data analysis: The Statistical Package for Social Sciences (SPSS), version 26 was used to analyze the data. Quantitative data were depicted as means and standard deviations, while frequencies and percentages were used to sum up qualitative data. The student t-test and Chi-square test were applied to assess the association between DD and patient characteristics. Pearson's correlation was employed to

explore the relationship between the self-care activities scale and various patient characteristics. Binary logistic regression analysis was performed to identify predictors of DD. A p-value of ≤ 0.05 was regarded as statistically significant for all tests.

RESULTS

Table (1) shows that the average age of patients was 53.9±9.6 years. Most of the patients were females (85.5%), from rural residences (86.4%), illiterate (84.1%), and married (94.2%). The mean duration of diabetes was 9.34±5.7 years. Regarding treatment modality, 60% were taking oral hypoglycemics, 31.9% were on insulin therapy and 8.1% were taking both types of treatment. More than half of the patients were obese (56.3%) and about two-thirds of them had uncontrolled blood glucose levels (67.1%) according to HA1c measurement which had a mean value of 8.85±2.01 mg/dl. More than half of patients (59.7%) were hypertensive while only 17.6% had cardiac comorbidity. Neuropathy was the most common reported complication (64.1%) followed by retinopathy (13.6%) and hyperglycemia (8.1%). Figure (1) shows that 47.8% of patients had moderate or high levels of DD while 52.2% of them had little or no DD.

Table (2) implies that among 295 patients with Type 2 diabetes, the average total score of DD was 31.7±12.7 while the average score for each subscale was physician-related distress (7.2±4.6), regimen related distress (11.08±7.1), interpersonal distress (5.8±4.2) and emotional burden (6.9±3.7). The highest level of distress was regimen-related among 49.5% and the

lowest was emotional burden among 13.6%. Regarding the stigma scale, the average total score was 80.4 ± 12 while the mean scores for each subscale such as treated differently, blame and judgment, self-stigma was (26.5 ± 4.4), (31.5 ± 3.5), and (27.2 ± 3.1) respectively. The total mean score of self-care activities was 31.34 ± 11 and the mean for each of the four items: diet, exercise, blood glucose testing, foot care was 19.1 ± 6.8 , 3.9 ± 1.9 , 3.6 ± 1.8 and 4.8 ± 3.5 respectively.

Table (3) shows that there was a statistically significant association between DD and age groups (p -value= 0.022) where about two thirds of patients (58.8%) with age group less than 40 years have moderate or high distress in comparison to 57.5% of patients with age more than 60 years and 41.4% of patients with age group 40-60 years. Regarding marital status, nearly half of married patients (49.6%) had moderate or high DD in comparison to 17.6% who were not married with a statistically significant difference (p -value= 0.01). Concerning type of treatment, 57.4% of patients using insulin had moderate or severe distress in comparison to those using oral treatment (45.8%) or both insulin and oral hypoglycemic drugs (25%) with statistically significant difference (p -value= 0.012).

As regards co-morbidities, moderate or severe DD were more in hypertensives (52.8%) than non-hypertensive patients (40.3%) with statistically significant difference (p -value=0.035). Interpreting the late complications revealed that there was statistically significant relationship between DD and nephropathy only (p value= 0.021).

About diabetes control, the average means of HbA1c were higher in patients with moderate or high distress with a statistically significant difference (p -value =0.01). There was a statistically significant relationship between the diabetes stigma scale and the DD scale (p -value= 0.004) where higher mean of the diabetes stigma scale in patients with moderate or high DD in comparison to those of little or no DD. Concerning the selfcare activities scale, the mean value of the selfcare scale was higher in patients with moderate or high distress than those of little or no distress but without a statistical significant difference (p -value= 0.102).

Figure (2) displays statistically significant negative mild correlation between total self-care score and diabetes duration, age and HbA1c. Table (4) shows the adjusted logistic regression model for predicting DD.

For moderate or high distress, aged 40-60 years, being married, hypertensive, having nephropathy, high level of stigma and elevated HbA1c significantly predict moderate or higher levels of DD.

DISCUSSION

Diabetes distress is common and affects a significant proportion of individuals diagnosed with diabetes worldwide. The prevalence of DD varies across different studies conducted globally. The current study reported that 47.8% of patients with diabetes had moderate or high levels of DD, while 52.2% of them reported little or no DD. The subscale that attracted the highest mean score and prevalence was “regimen-related distress” (11.08 ± 7.1 , 49.5%). The higher prevalence of DD in this study may be attributed to the fact that it was conducted in a tertiary healthcare facility, which treats many patients in the advanced stages of diabetes.

A study conducted at Cairo University hospitals; Egypt also found that slightly more than one-third of the participants (37%) experienced high degrees of DD.¹² Likewise, the level of DD reported in this research, seems to be within the average range of universal percentages, as 44% in South Africa, 45.4% in the USA and 48.5% in Bangladesh.²⁰⁻²²

Lower reporting of moderate to high DD was observed in 17.6% in India, 12.5% in Vietnam, and 8.9% in Thailand.²³⁻²⁵ The lower prevalence observed in these studies can be attributed to several variables, including significant differences in sample sizes, easy access to healthcare, the availability of free treatment as well as health conditions such as HbA1c level, and co-morbidities.²⁶ Additionally, enrollment of participants from primary care units revealed lower rates of DD, where patients have better health conditions and higher satisfaction rates.²⁷

Conversely, higher sharing of DD was noted in Iran (68.5%) and Sudan (87.6 %).^{28, 29} Similarly, in Alexandria, Egypt where high DD was shown up by 45.6% of the patients, moderate by 39.4% and Only 15% of the patients had no or low DD.³ These higher rates of DD may be due to the involvement of patients with type 1 diabetes in some studies as in Iran.²⁸ This, in turn, coupled with their younger age, insulin treatment, and prolonged duration of diabetes, makes them more susceptible to higher levels of DD.

The discrepancies observed between the findings of different studies may be due to several factors,

including the sociodemographic, cultural, and health-related characteristics of the study participants, as well as the methods used for assessing DD.

Among our participants, the highest level of distress was regimen-related (49.5%) with a mean score of 11.08 ± 7.1 . Likewise, the same was reported in Egypt and Iran, where the most affected domain was regimen-related distress.^{30, 31} It has been established that patients with type 2 diabetes experience more regimen-related distress, while those with type 1 diabetes are more concerned about fatigue and hypoglycemic events.³²

Diabetes is a mostly self-managed disorder. The significant burden of living with diabetes often involves constant management of diet, physical activity, blood glucose monitoring, and medication, which can lead to frustration due to the ongoing demands of these responsibilities. The higher prevalence of regimen-related distress highlights the importance of physicians engaging in discussions with patients about diet and treatment options. This approach can help alleviate their worries and improve compliance by making the treatment strategy more reasonable and adapted to individual needs.

Regarding age, approximately two-thirds (58.8%) of patients under 40 years' experience moderate or high distress. Likewise, in Alexandria, Egypt it was reported that DD was more prevalent among patients aged 40 to 49, with younger age being associated with higher levels of distress.³

Similarly, in Saudi Arabia, patients less than 45 years were significantly linked with DD, while in Nigeria, younger age was linked to higher levels of distress.³³

³⁴ A possible explanation for this relationship may be that younger individuals face additional stressors in managing diabetes, such as household concerns, work, and economic challenges. Besides, they may struggle to handle efficiently with these demands, as they are not developmentally prepared for such restrictions. Furthermore, as age rises, DD declines, possibly due to the continuing adaptation to a diabetic lifestyle, which leads to diminished suffering over time as reported by prior research in India.³⁵

In the current study, being married elevates the probability of developing DD. This is consistent with the findings of previous studies.^{3, 12, 26} The significant connection may be due to the challenges married patients face in matching diabetes management with their family concerns and tasks. Additionally, it shows

the difficulties they encounter in trying to stabilize their own life while managing the limitations that diabetes may impose on their marital life.

In contrast, previous studies have shown that divorced individuals experience significantly higher DD compared to those who were single, married, or widowed.^{26, 30, 36} This could be related to higher levels of distress typically experienced by divorced individuals compared to those who are single or married.

Regarding treatment modality, there was significant association with diabetic distress as 57.4% of patients using insulin reported moderate or severe DD. Patients using insulin must frequently monitor their blood sugar levels, and the need to fraction meals can limit their daily activities. Managing these factors require individuals to have a high level of competence and self-management skills.³⁷

Conversely, previous studies found that DD was more likely to be reported by patients with diabetes on combination therapy.^{22, 36} Complex treatment regimens can be more difficult for participants to follow and may lead to increased distress.³⁸

About diabetes control, the level of HbA1c was higher in patients with moderate or high distress with a statistically significant difference ($p\text{-value} = 0.01$). This was in line with previous reports.^{22, 26, 33, 34, 36, 39} Predictably, the increased level of HbA1c indicates treatment breakdown, which may be linked to more DD.⁴⁰

Regarding stigma, the current study revealed that high level of stigma significantly predicts moderate or higher levels of DD. Similarly, in China, diabetes stigma was a significant predictor of DD.⁴¹ The results of the meta-analysis revealed a strong association between stigma and psychological distress in people with diabetes.¹⁰

DD can stem from the social consequences of diabetes, such as stigma. This stigma occurs when individuals experience negative emotions like rejection, shame, or guilt due to the identified social stigma of enduring diabetes. Socially visible factors, such as insulin injections, checking blood glucose, nutritional constraints, obesity, and hypoglycemic incidents, can promote this stigma. Furthermore, feeling stigmatized can lead to distress, which may affect diabetes management. Patients may be less willing to adhere to suggested treatments, especially those that are public,

like insulin doses, using an insulin pump, or self-checking blood glucose.^{8,42}

Regarding the self-care activities, the mean score was higher in patients with moderate or high distress compared to those with little or no distress, although the distinction was not statistically significant. This aligns with the finding of previous study conducted in Indonesia, revealing that DD does not link to self-care.⁴³

Valuable informed that this study noticed a statistically significant, mild negative correlation between self-care activities and factors such as diabetes duration, age, and HbA1c levels. In India, a significant link had been observed between self-care activities and the level of glycemic control.⁴⁴ As well, in Sir Lanka compliance to therapy, physical exercise and nutrition were significantly linked with HbA1c.⁴⁵

This study has some *limitations*. First, participant recruitment was conducted at a single tertiary care center, which may raise concerns about the generalizability of our findings. Next, the cross-sectional model of the study boundaries the capability to launch definitive fundamental interactions between DD, stigma, self-care, and related factors. Longitudinal prospective studies are needed to demonstrate causality and explore these issues in a larger, more representative sample of diabetes patients. Despite these limitations, our study has points of **strength** as large sample size and using validated questionnaires.

CONCLUSIONS

The findings of the current study revealed that aged 40-60 years, being married, hypertensive, having nephropathy, high level of stigma, and elevated HA1C significantly predicts moderate or higher levels of DD. Age, duration and HA1C were significantly negatively correlated with selfcare activities. Identifying the source of diabetes-related distress is essential for effectively addressing it, as the persistence or change in distress over time depends on its origin. If untreated, mild DD can persist and potentially escalate into more severe distress. Diabetes management protocols should focus on screening for DD and addressing diabetic stigma, while also tailoring self-care activities to meet individual needs.

Ethical Consideration

The purpose of the study was explained to participants before completing the questionnaire. Informed

consent was obtained from all participants before the interview, ensuring that their involvement would not affect their clinical services or therapy. The legal guardian of the participants who were illiterate provided informed permission to participate in the study. Privacy and confidentiality of all data were guaranteed. The study obtained all required approvals from the Ethical Review Committee of Assiut Faculty of Medicine (IRB no: 04-2023-300237). Administrative permission was obtained from the authority of AUH to conduct the study.

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Conflict of Interest

The authors have no conflict of interest to declare.

Author Contributions

The research concept was developed by the study authors. SHH and HGA analyzed the data, performed all analyses, and wrote the initial draft of the paper. SMO contributed to data collection and entry. All authors were involved in data collection and the overall study design. The final version of the manuscript was approved by all authors prior to submission.

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Data Availability

Due to participant privacy, the data cannot be shared openly but is available upon reasonable request from the corresponding author.

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