DIABETES-RELATED DISTRESS AND SELF-EFFICACY AMONG ADOLESCENTS WITH TYPE 1 DIABETES

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Abstract
Type 1 Diabetes is a chronic autoimmune disease that affects individuals of all ages, but it is most commonly diagnosed in children and adolescents. Adolescents with Type 1 Diabetes face unique challenges, including managing their blood glucose levels, adhering to treatment regimens, and dealing with the emotional impact of the disease. The research statement suggests that understanding the relationship between self-efficacy and diabetes distress could help healthcare providers develop more effective interventions to support adolescents with Type 1 Diabetes. First by highlights the importance of assessing and addressing diabetes distress in this population. Second, it suggests that interventions aimed at improving general self-efficacy may be effective in reducing diabetes distress.
Objective:
- Determining the level of diabetes-related distress among adolescents with type 1 diabetes.
- Determining the level of general self-efficacy among adolescents with type 1 diabetes Relation.
- Finding the relationship between general self-efficacy and diabetes-related distress.

Materials and Methods: descriptive study from carried out at The Specialized Center of Endocrinology Diseases and Diabetes Mellitus in Al-Nasiriyah city. The study conducted at April 2023. Data collected by conducting interviews with adolescents to answer on the instrument of study 17 item diabetes distress scale (DDS) and general self-efficacy scale (GSES).
Results: A total of 220 adolescents with type 1 diabetes aged 12 to 18 years participated in this study. Adolescents experienced the moderate levels of distress in the emotional burden (2.11), Regimen-related distress (2.11) and Interpersonal-related distress (1.98) domains while have low level of distress in the physician-related distress domain (1.66). There is significant negative correlation between self-efficacy and all domains of diabetes related distress.
Conclusions: The study concludes that by promoting self-efficacy and addressing diabetes distress, healthcare providers can help adolescents better manage their disease and improve their overall quality of life.
KEYWORDS: Typ1 diabetes, Distress, Self-Efficacy, Adolescents

INTRODUCTION

Type 1 diabetes mellitus (T1DM) is considered one of the major types of diabetes mellitus that arise from autoimmune destruction of pancreas that makes it unable to secrete insulin [1]. Diabetes is projected to be the seventh leading cause of death by 2030 and is predicted to increase to 642 million people by 2040. Diabetes is a challenging disease that requires lifelong management in order to maintain control [2]. Type 1 diabetes mellitus varies significantly between countries with the highest incidence been reported in Northern Europe (52.8 per 100 000 in Finland) and the lowest in China and Venezuela (0.1 per 100 000). The annual worldwide incidence of type 1 diabetes mellitus is estimated to be 79,000 and the prevalence to be 500,000 among children younger than 15 year of age [3]. The treatment regimen for adolescent with diabetes is burdensome due to the constant demands, including monitoring glucose, counting carbohydrates, and dosing medications[4] Adolescence is a crucial period of an individual's development. It is a time of different developmental processes, including physical; physiological; emotional; cognitive; identity; and social developments. having a chronic condition can make this period more challenging. Individuals with type 1 diabetes need to adhere to a daily, strict, and labour-intensive regimen[5]. Patients with diabetes experience psychosocial and emotional issues in response to these prolonged treatments, including worry about complications, fear of hypoglycemia, fatigue regarding poorly controlled blood glucose, and worthlessness. One of the emotional burdens is diabetes-related distress (DD) which is defined as a patient's concerns about diabetes mellitus, its management, the need for support, and access to healthcare. It may worsen the outcomes of DM. Poor or insufficient treatment of psychological disorders may cause inadequate self-care, impedes medication adherence, leading to poor glycemic control and increased morbidity and mortality[6]. People managing a chronic disease, like diabetes, often endure a life-long struggle to assimilate constantly changing treatment regimens and lifestyle recommendations into their daily lives. This adds another layer of tasks, responsibilities, and stress to manage for people living with diabetes. Diabetes distress is the expected emotional stress that is directly related to the burden of managing diabetes This term was first coined in 1995 by a group of psychologists and psychiatrists from the Joslin Diabetes Centre[7]. Self-efficacy partially mediated the relationship between perceived stress and self-management,

suggesting that interventions aimed at increasing self-efficacy may help mitigate the negative impact of perceived stress on self-management healthcare providers should assess and address self-efficacy in their management plans for adolescents with T1DM [8]. Children and adolescents with type1diabetes (T1D) experience a low-level of self-efficacy because of problems such as diet, limited activity, invasive monitoring of blood sugar, daily insulin injections, chronic physical complications, and hospitalization imposed on them by the disease [9].

Materials and Methods

Study design: Descriptive study.

Study setting: The research was carried out at The Specialized Center of Endocrinology Diseases and Diabetes Mellitus in Al-Nasiriyah city in order to get reliable as well as thorough data.

Study sampling: There are approximately (2000) adolescent patients registered at The Specialized Center of Endocrinology Diseases and Diabetes Mellitus for treatment, care, and follow-up. A non-probability (convenience) sampling technique is designated to obtain data as accurate as possible. The sample size is (220) patients.

- To select a representative sample size for the study population, the Steven Thompson equation was used to calculate the sample size of the population with a known number at a confidence level of 95% (or a significance level of 0.95) and a standard deviation of 0.5.
- After applying the equation, the sample size found to be 220 adolescent.

Instrument of study: The tool consists of three parts:

Part I: Including items related demographic data: age, sex, educational levels, economic status.

Part II: The Chinese version of the Diabetes Distress Scale [10]

Part III: General Self-Efficacy Scale (GSES) [11]

Ethical Approval: The study was achieved in accordance with the ethical approval before data collected, the study protocol appraised and approved by nursing collage domestic committee, theme information, and permission form (dated June 26, 2023).

Results

The results of the data analysis presented systematically in tables and are in accordance to selected study objectives:

Table1: Distribution of the sample according to their demographic characteristics

Variables		N= 220	
		N	%
Age (Years)	11-13 Years	66	30.0
	14-16 Years	132	60.0
	17-19 Years	22	10.0
Total		220	100
Sex	Male	77	35.0
	Female	143	65.0
Total		220	100
Educational levels	Illiterate	1	0.5
	read and write	21	9.5
	Elementary school	58	26.4
	Intermediate school	140	63.6
Total		220	100
Family Monthly income	Below 500000 IQD	110	50.0
	500000 to 999999 IQD	88	40.0
	1000000 to 1999999 IQD	22	10.0
Total		220	100

Table 1 illustrate that the highest percentage of adolescents 60.0 % fell into the age range of 14-16 years. In terms of sex, 65.0% of adolescents were female. Regarding to the educational levels, 63.0 % of the adolescents were in Intermediate school. In terms of Family Monthly income, 50.0 % of sample had an income below 500000 IQD that considered not enough.

Table 2: levels of diabetes distress among adolescents with typ1 diabetes according to diabetes related distress domains:

Diabetes related distress domains	Mean of score	Assessment
Emotional burden	2.11	Moderate level
Physician-related distress	1.66	Low level
Regimen-related distress	2.11	Moderate level
Interpersonal-related distress	1.89	Moderate level

mean of score (1-1.66 low, 1.67-2.33moderate, 2.34-3 high)

Table 1 show that the overall diabetes related distress domains indicate that the distress among adolescent with typ1 diabetes were moderate level at emotional, regimen-related and interpersonal-related distress domains except at Physician-related distress were low.

Table 3: levels of general self-efficacy among adolescents with typ1 diabetes:

General self-efficacy	Rating	f	%	M.S	Level
	Low	**134**	**60.9**	**1.58**	**Low**
	Moderate	**44**	**20.0**		
	High	**42**	**19.1**		
	Total	**220**	**100.00**		

F= Frequency; %= Percent; m.s=mean of score(1-1.66 low, 1.67-2.33moderate, 2.34-3 high)

This table show that the overall general self-efficacy among adolescent with typ1 diabetes were at low level.

Table 4: linear regression analysis of correlates of four domains of DDS in participants with type 1 diabetes.

Diabetes related distress domains	General self-efficacy			
	R^2	β	P.V	Sig
Emotional burden	.720	-.347-	.000	S
Physician-related distress	.853	-.261-	.000	S
Regimen-related distress	.682	-.355-	.000	S
Interpersonal-related distress	.796	-.329-	.000	S

B= Beta; sig= significant (p-value <0.05= significant, p-value> 0.05=non-significant).

This table show that the study result indicate that there is a negative statistical highly significant relationship between the four domains of diabetes related distress and General-self-efficacy at p-value < (0.05).

Discussion:

The Demographic Data of the Distributed Sample:

Through finding overview of the current study, the demographic characteristic of the samples presented that the most ages of the samples between (14-16 years) accounted for (60.0%) of total study's participants These results reflect those of study in Holy City of Karbala/Iraq who found that the average age of

adolescent were (12.11) years [12].

The current study findings reported that, more than half of the studied adolescent 143(65%) were females. This finding was agreed with study done in Iraq on type 1 diabetes adolescents, found that the majority 28 (87.5) of study sample were female individuals[13].

Findings from present study illustrated that more than half of the studied adolescents were at intermediate school. This study finding was in line with the study on Type 1 Diabetes and Its Management among Saudi Children and Adolescents" reported that most of the studied adolescents were in intermediate school education[14].

Through finding overview of the current study, the demographic characteristic of the samples presented that the monthly income of samples between (500000 to 999999) accounted for (40.0%) of total study's participants These results reflect those of study done on the Impact of Diabetes Distress on the Glycemic Control Among Adolescents and Youth With Type 1 Diabetes in Two Tertiary Centers, Jeddah, Saudi Arabia " also found that, the highest percentage (30%) of samples monthly income were between (5,000-10,000)[15].

levels of diabetes distress among adolescents with typ1 diabetes according to diabetes related distress domains:

The first study objective was to identifying the levels of diabetes distress among adolescents with T1DM receiving care Specialized Center of Endocrinology Diseases and Diabetes Mellitus in Al-Nasiriyah city. In the study, data collection included determining DDS scores in evaluating the existence and level of reported diabetes distress among individuals who completed the questioner.

The highest mean level of reported diabetes distress among all participants involved emotional burden and regimen-related distress at 2.11. and the lowest mean level of diabetes distress was physician distress, at 1.66. These findings revealed that participants reported.

The overall a degree of diabetes distress categorized as “moderate distress.” Results also showed that participants reported a moderate degree in the emotional burden and regimen-related distress this may be due to Social challenges, adolescents with type 1 diabetes can face psychosocial challenges such as feelings of isolation, discrimination, and social challenges, and these challenges can lead to increased distress and anxiety in these children or related to health, Teens with first diabetes can feel overwhelmed by their presence and their ability to control their blood sugar levels, and this anxiety can lead to increased distress for them. This is consistent with what was found in the study conducted in Southwest Virginia where it was found that The overall mean level of diabetes distress reported among all participants was 2.409, with a standard deviation of 0.853. The subcategory with the highest mean level of reported diabetes distress among all participants involved emotional burden, at 3.214 [16].

levels of general self-efficacy among adolescents with typ1 diabetes according to diabetes related distress domains:

the study results revealed that the studied adolescents had a low self-efficacy score. This may be due to lack of adequate awareness, Some teenagers with type 1 diabetes may suffer from a lack of sufficient awareness of the disease and ways to deal with it, which leads to a low level of self-efficacy in them. Non-compliance with treatment and not following a healthy diet can lead to a low level of self-efficacy in a teenager with type 1 diabetes, as it becomes difficult for him to control his blood sugar levels. This study finding was in accordance with the study in study was conducted in Diabetes Center, Kashan, Iran on Self-efficacy in Adolescents with Type 1 Diabetes Mellitus, that found most studied adolescents' with juvenile diabetes had a low self-efficacy score[17]. while this finding was disagreed with the study in five university hospital districts in Finland reported that, the self-efficacy among the studied sample was quiet good [18].

Correlation of four domains of DDS in participants with type 1 diabetes.

the study result indicate that there is a statistical highly significant relationship between the four domains of diabetes related distress and General-self-efficacy at p-value level of <0.05 (0.00) and negative direction according to Standardized Coefficients Beta. This means that a decrease in the levels of self-efficacy increases the rates of distress associated with type 1 diabetes among adolescents. and this matches exactly what said in study done at Diabetes Center of Central South University in Hunan Province of China were found that the relationship was negative between diabetes-related stress and self-efficacy[19].

There are several factors that lead to the inverse relationship between type 1 diabetes-related distress and self-efficacy in adolescents with the disease, including: Increased level of psychological stress: Teenagers with type 1 diabetes suffer from a high level of psychological pressure, as they feel anxious, tense, and frustrated, which affects their level of self-efficacy. The impact of the disease on daily life: Type 1 diabetes greatly affects the lives of adolescents, as they must follow a healthy diet and conduct blood sugar level tests on a regular basis, which affects their daily lives and their ability to carry out daily activities efficiently. Social and psychological challenges: Adolescents with type 1 diabetes face social and psychological challenges that affect their level of self-efficacy, as they feel withdrawn, isolated, and weak.

Conclusions and recommendations

The study found that there is a significant negative correlation between diabetes-related distress and self-efficacy in adolescents with type 1 diabetes. This suggests that as diabetes-related distress increases, self-efficacy decreases. So the health care provider must incorporate strategies to reduce diabetes-related distress in their treatment plans for adolescents with type 1 diabetes. This may include providing emotional support, education on coping skills, and access to mental health services.

References

1. Nabeel Mohammad, F., Abdelateef Abdelaziz Ramadan, R., & Mosbah Elsayed Mohamed, N. (2020). Knowledge and Self-efficacy among Children with Type 1 Diabetes and their Caregivers. Egyptian Journal of Health Care, 11(1), 1199-1210.

2. Vaca, L. M. (2020). Implementation of a Diabetes-Related Distress Scale in a Primary Care Clinic (Doctoral dissertation, North Dakota State University).

3. Almahfoodh, D., Alabbood, M., Alali, A., & Mansour, A. (2017). Epidemiology of type 1 diabetes mellitus in Basrah,

Southern Iraq: A retrospective study. diabetes research and clinical practice, 133, 104-108.

4. Johnson, S. T., Al Sayah, F., Mathe, N., & Johnson, J. A. (2016). The relationship of diabetes-related distress and depressive symptoms with physical activity and dietary behaviors in adults with type 2 diabetes: a cross-sectional study. Journal of Diabetes and its Complications, 30(5), 967-970.

5. Momani, A. M. (2019). Understanding Type 1 Diabetes Self-Care Management Among Adolescents and their Parents in Jordan: A Qualitative Study. The University of Manchester (United Kingdom).

6. Nguyen, V. B., Tran, T. T., Dang, T. L., Nguyen, V. V. H., Tran, B. T., Le, C. V., & Toan, N. D. (2020). Diabetes-related distress and its associated factors among patients with diabetes in Vietnam. Psychology Research and Behavior Management, 1181-1189.

7. Skinner, T. C., Joensen, L., & Parkin, T. (2020). Twenty-five years of diabetes distress research. Diabetic Medicine: A Journal of the British Diabetic Association, 37(3), 393–400. https://doi-org.proxy006.nclive.org/10.1111/dme.14157.

8. Eilander, M., de Wit, M., Rotteveel, J., & Snoek, F. J. (2016). Low self-confidence and diabetes mismanagement in youth with type 1 diabetes mediate the relationship between behavioral problems and elevated HbA1c. Journal of diabetes research, 2016.

9. Nabeel Mohammad, F., Abdelateef Abdelaziz Ramadan, R., & Mosbah Elsayed Mohamed, N. (2020). Knowledge and Self-efficacy among Children with Type 1 Diabetes and their Caregivers. Egyptian Journal of Health Care, 11(1), 1199-1210.

10. Yang, Q. & Liu, X. Q. (2010). Reliability and validity of the diabetes distressscale. Journal of Nursing., 17(9A), 8–10.https://doi.org/10.3969/j. issn.1008-9969.2010.17.003

11. Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. In J.Weinman, S. Wright, & M. Johnson (Eds.), Measures in health psychology: A user's portfolio, Causal and control beliefs (pp. 35–37). NFER-NELSON.

12. Aljallad, W. M. A., Al-Ghabban, S. I., & Al-Mhanna, M. G. H. (2020). Quality of Life among Sample of Children and Teenagers with Type 1 Diabetes Mellitus in Holy City of Karbala/Iraq 2019. Indian Journal of Public Health, 11(02), 1197.

13. Alabedi, R. F. (2020). Comparative study between multiple daily injections and conventional insulin regimens in Iraqi children and adolescents with type 1 diabetes mellitus. Annals of Tropical Medicine and Public Health, 23, 12.

14. Aldossary, L., & Snelgrove, S. (2020). Knowledge and understanding of Type 1 Diabetes and its management among saudi children and adolescents. Journal of Diabetes Mellitus, 10(01), 1-15.

15. Alyahyawi, N. Y., Alrifay, R. M., Albadi, N. A., Alqahtani, M. Y., Alzahrani, R. M., Nazer, B. A., ... & Albadi, N. (2021). The impact of diabetes distress on the glycemic control among adolescents and youth with type 1 diabetes in two tertiary centers, Jeddah, Saudi Arabia. Cureus, 13(8).

16. Hedge, V., Carter, K., Downey, W., & Sharp, H. (2023). Prevalence of Diabetes Distress Among Adolescents With Type 1 Diabetes Mellitus. The Journal for Nurse Practitioners, 19(3), 104383.

17. Yosefi, Z., Afshar, M., Mirbagher Ajorpaz, N., & Sadat, Z. (2021). The effect of training based on james brown model on self-efficacy in adolescents with type 1 diabetes mellitus. Journal of Holistic Nursing and midwifery, 31(2), 76-84.

18. Survonen, A., Salanterä, S., Näntö-Salonen, K., Sigurdardottir, A. K., & Suhonen, R. (2019). The psychosocial self-efficacy in adolescents with type 1 diabetes. Nursing Open, 6(2), 514-525.

19. Luo, J., Wang, H., Li, X., Zhou, Z., Valimaki, M., Whittemore, R., ... & Guo, J. (2021). Factors associated with diabetes distress among adolescents with type 1 diabetes. Journal of Clinical Nursing, 30(13-14), 1893-1903.