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Investigation of the Effectiveness of Emotion Regulation Training on Emotion Regulation Strategies and Depression of Pediatric type I Diabetes

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Abstract

Objective: This study aimed to evaluate the effectiveness of emotion regulation training on depression and emotion regulation strategies of pediatric type I diabetes.

Materials and Methods: The study used a quasi-experimental approach that included pre-and post-test assessments to compare the experimental and control groups. The University of Medical Sciences in Shiraz, provided services to a total of 30 patients. Patients were chosen using purposive sampling and were randomly allocated to either the experimental group (n=15) or the control group (n=15) Pediatric types I diabetes. The Beck Depression Inventory (BDI-II) and the Gross and John Emotion Regulation Questionnaire were used to collecting data. The experimental group got eight training sessions on depression and emotional regulation (once a week for two months), whereas the control group got no instruction. The data was analyzed using an analysis of covariance by SPSS.23.

Results: The mean (±SD) of age in the experimental group and control groups were determined to be 14.60 (±0.88) and 14.46 (±073) years, respectively. According to the results, emotion regulation training had a significant effect in decreasing depression and increasing the adaptive emotional regulation strategies in students ($P<0.001$).

Conclusion: Emotion regulation training might be a useful strategy for improving emotion regulation difficulties in patients with type I diabetes, according to the findings of this investigation, although the efficacy of emotion regulation training was not approved in this investigation due to a lack of intervention factors.

Keywords: Emotion **r**egulation, Strategies, Depression, Pediatric, Type I **d**iabetes

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Introduction

Children and adolescents with type1diabetes (T1D) often experiences mental health disorders. According to recent data, children and adolescents with T1D have comorbidity rate of mental health illnesses of 20 to 50 percent. It's crucial to note that not all studies show a substantial rise in psychopathology in diabetic patients, while the risk is higher in diabetic children and adolescents than in healthy children and adolescents. There is now substantial evidence of a link between psychiatric illnesses and juvenile diabetes (1). Furthermore, research shows that adolescents with T1D have more severe internalizing symptoms than healthy adolescents (2).

According to the findings, approximately one in seven young people with diabetes met the clinical criterion of depression. This degree of depressive symptoms in children and adolescents with T1D is about double that of the highest estimate of depression in young people in general (2,3) While the percentage of teenagers meeting clinical depression criteria in this study differs from prior findings (1,4), it is comparable with recent investigations of depression in T1D adolescents (1,4).

Furthermore, a recent study suggested that emotional aspects play a significant role in diabetes management (4,5). According to the study, the burden of diabetes and its treatment adds to mental distress (6.7). Because emotional distress is linked to a decline in self-care behaviors and adherence to protocols and care routines, emotional discomfort associated with diabetes can affect blood glucose management (8). Several studies show that, even at low levels of glycemic control, the distress associated with diabetes is highly linked to glycemic control, even after adjusting for other emotional and clinical variables such as clinical depression (9). The research literature specifically reveals that anxiety and depression affect adherence to diabetes treatment because patients are less likely to follow their healthcare professionals' recommendations due to the difficulties involved with adhering to lifestyle restrictions (9-14).

Self-regulation (SR), or the ability to manage one's thoughts, emotions, and actions in order to attain the desired objective, has been shown to have a significant impact on people's health outcomes in decades of studies (15). Adolescents with diabetes must follow a complicated self-care regimen that involves blood glucose monitoring, insulin administration via daily injections or a pump, carbohydrate consumption regulation, frequent physical activity, and reducing both hyper- and hypoglycemia (16). Each of these is a daily chore that necessitates the use of SR. Executive function (EF) capabilities such as working memory and planning, for example, are required to remember and stick to nutrition and exercise programs (4). Emotion regulation (ER) abilities are critical for coping with diabetes-related suffering, overcoming depression, and controlling anxiety that interferes with blood sugar monitoring (15). Given this body of evidence, the prevalence of poor adherence to treatment among adolescents with T1D, and the fact that treatment regimens move from parent-managed to adolescent-managed throughout this period of time, increasing adolescents' SR capability could be a suitable way for assisting them in better managing care process tasks (16). The purpose of this study was to evaluate how successful emotion regulation training was in treating depression and developing emotion management methods in children with T1D.

Materials and Methods

The study was a quasi-experimental design with pre-test and post-test evaluations to compare the experimental group with a control group. Based on previous studies (17), a total of 30 patients received services at the University of Medical Sciences in Shiraz, Iran

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in the year 2019-2020. Adolescents must meet the following criteria in order to participate: 1) have experienced T1D for at least 6 months; 2) be between the ages of 13 and 17; 3) reside with a parent/legal guardian who is the primary caregiver; 4) HbA1c of less than 7.0; and 5) be confident enough in English to perform research activities. Exclusion criteria include 1) non-fluency in person in either the parent or the pediatric type I diabetes; 2) absence of two or more intervention training sessions. Following a review, 30 patients were chosen who matched the inclusion criteria. Patients were assigned to one of two groups by odd and even numbers: experimental (15 children with T1D) or control (15 children with type 1 diabetes) (15 children with pediatric T1D). Participants in this study didn't take any drugs, didn't have any chronic health difficulties, and didn't have any behavioral disorders. The Beck Depression Inventory and the Emotion Regulation Questionnaire were used to gather information.

They were then randomly assigned to one of two groups: control or experimental and asked to fill out a questionnaire about depression and emotion regulation skills. Parents were informed about the research project. Researchers assured parents that their children's data would be kept confidential. After the research was finished, the control group got an education in emotion management techniques. The experimental group was then given an educational program focused on treatments related to emotion management abilities. Emotion control training was devised by Gratz and Gunderson (20). Over the course of eight sessions, this technique was presented (every session: 90 minutes). At the completion of these sessions, both groups were given post-test evaluations. The experimental group was taught methods and techniques of emotional regulation strategies for 8 sessions after the above-mentioned meetings (training sessions of emotion regulation skills were held once a week for 2 months), whereas the control group received no psychological training during this time. After 8 sessions of emotional regulation training, participants attempted to finish the surveys. It's worth noting that the researcher worked directly with participants throughout the procedure, answering their questions and alleviating any worries they might have. After the experiment finished, the children's participation in research and emotion management training sessions for the control group received parental permission. Six of the 36 patients who were eligible for the trial declined to participate. Finally, the trial was done by 30 patients (15 participants per group; Figure 1).

Beck's Depression Inventory (BDI-II)

The Farsi (Persian) version was used in this inquiry. The Beck Depressive Inventory-II is a brief self-report questionnaire for determining the severity of depressive symptoms (21). The following norms were provided: normal (0–3), moderate depression (4–7), moderate to medium depression (8–11), average depression (12–15), and severe depression (12–15). (18). Previous research with Iranian participants has Cronbach alpha values ranging from.89 to.94 (17).

Emotion Regulation Questionnaire (ERQ)

The ERQ (19), a 10-item self-report questionnaire, is divided into two measures that correlate to two different emotion regulation strategies: a cognitive reappraisal (6 items) and expressive suppression (6 items) (4 items). People's inclinations to manage emotions by altering ideas are assessed on the reappraisal subscale, whereas individuals' inclinations to repress emotion expression are assessed on the suppression subscale. The reappraisal subscale assesses people's proclivity to control emotions by changing their views, whereas the suppression subscale assesses people's proclivity to suppress emotion expression.

The reappraisal and suppression scales have been demonstrated to have strong 3-month test-retest reliability (0.69 for both measures), as well as indications of validity (19). In the current analysis, the internal consistency of the Persian version of the ERQ was discovered to be 0.72. (20).

Ethical considerations

This material is adapted from the study plan with the code of ethics authorized by IR.IAU.AUS.REC.1398.019 from the research ethics committee of the Azad University of Shiraz. All people who contributed to this research are recognized and acknowledged.

The data were analyzed using descriptive statistics (mean and SD) and inferential statistics (Univariate analysis of covariance (ANCOVA)). It's worth noting that all data analysis was done with SPSS Version 23 software. The assumption of the normality of anxiety and emotion regulation processes was tested using the Kolmogorov Smirnov test. The normality of scores was confirmed in both the experimental and control groups (P> 0.05) using this test. The assumption of homogeneity of variances in variables must be investigated. The variation of variables between the experimental and control groups did not change significantly (P> 0.05), according to the findings.

Results

The mean (±SD) of age in the experimental group and control groups were determined to be 14.60 (±0.88) and 14.46 (±073) years, respectively. Table 2 presents the descriptive data, including the mean and SD of scores of depression and emotion management strategies in experimental and control groups at pre-test and post-test.

As shown in table 3, a comparison of the findings between the two groups after controlling for the effect of pre-test and post-test revealed that the experimental group's Depression scores were not significantly higher than the control groups.

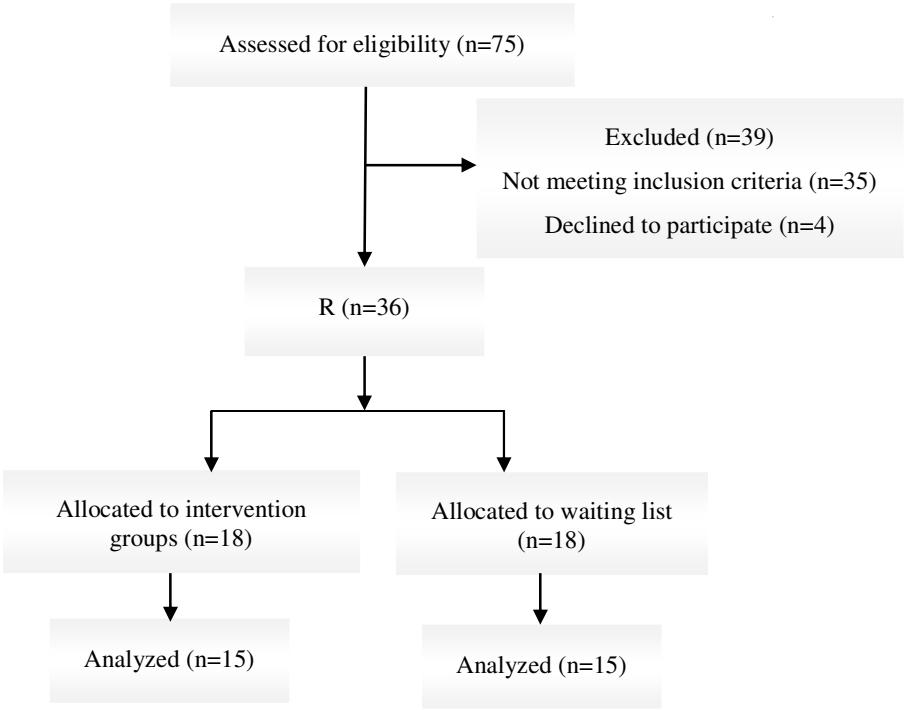

Figure 1. The consort model of the study

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Table 1. Gratz and Gunderson (20)

Session 1	Conducting pre-test, communicating, and introducing of emotion regulation training
Session 2	Awareness of positive emotions
Session 3	Awareness of negative emotions
Session 4	Acceptance of positive emotions
Session 5	Acceptance of negative emotions
Session 6	Educating reappraisal and expressing positive emotions
Session 7	Educating reappraisal and expressing negative emotions
Session 8	Concluding and conducting post-test

Table 2. Mean differences of anxiety and emotion regulation strategies in pre-test and post-test

Groups	Variables	Pre-Test Mean ±SD	Post-Test Mean ±SD	*p*
Experimental	Depression	14.49 (±1. 43)	14.68 (±1. 25)	0.001
	Suppression	26.20 (±2.90)	30.53 (±3.56	0.001
	Reappraisal	29.46 (±3. 28)	30.64 (±3.11)	0.001
Control	Depression	29.20 (±3. 9)	30.20 (±3.9)	0.001
	Suppression	19.43 (±2.20)	20.36 (±3.27)	0.001
	Reappraisal	22. 75 (±2.25)	23. 75 (±2.36)	0.001

According to table 3, a comparison of the findings between the two groups after controlling for the effect of pre-test and post-test revealed that the experimental group's reappraisal scores of pediatric T1D increased significantly more than the control group.

Furthermore, as a comparison of the findings between the two groups after controlling for the effect of pre-test and post-test revealed that the experimental group's depression (F1, 28= 165.4), suppression (F1, 28= 1168.23), and reappraisal (F1, 28= 58.23) scores of pediatric type I diabetes increased significantly when compared to the control group (*P*= 0.001).

Discussion

According to our data, there was a significant difference in depression signs and symptoms between the experimental and control groups in post-test evaluations. Evidence from the literature backs up our conclusions. for example, Garnefski observed similar results in early adolescents (age 12-15 years old), late teenagers (age 16-18 years old), and adults in general (age 18-65 years old). Higher catastrophizing, increased rumination, and lower positive reappraisal was related to depression in all samples. In all studies, more catastrophizing, greater ruminating, and poorer positive reappraisal were linked to depression (20).

High levels of self-blame in girls, higher catastrophizing and rumination, decreased positive reappraisal, and planning in both girls and boys were linked to an elevated degree of depression in a study of type 1 diabetic adolescents (21). This contradicts the findings of Mocan et al, who found that higher catastrophizing and lower positive reappraisal are linked to increased depressive symptoms in the setting of negative perceptions of disease implications, diabetic distress, and past depression history (22).

Self-efficacy is one probable link that explains why depressed symptoms are linked to lower diabetes health outcomes. Self-efficacy, or the idea that one can control one's diabetes, is lower in those who have more depressive symptoms. When you lack control, you may make harmful decisions because you believe that nothing you do will affect the outcome. Finally, depression and depressed symptoms are linked to poor overall functioning and bad subjective quality of life, in addition to bad illness consequences (23).

Another explanation is that depressed persons were more diabetes issues and comorbidities, more negative views of diabetes and diabetic misery, more rumination and catastrophizing, and less planning, positive reappraisal, and refocusing, as well as more negative perceptions of diabetes and diabetic misery, more rumination and catastrophizing, and less planning, positive reappraisal, and refocusing (24).

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Furthermore, this study's findings backed up the study's findings, which showed that children with type 1 diabetes in the experimental group were in better shape in the post-test evaluation in terms of emotion regulation methods and symptoms than children with type 1 diabetes in the control group. This finding is supported by Ruiz-Aranda et al. (7), Miller et al. (12), Ghiasvand and Ghorbani (24). Emotion regulation training, according to Ghiasvand and Ghorbani, might be an effective way to enhance emotion management and glucose management in type 2 diabetes patients (24).

The finding that emotional processing associated with self-control significantly improved HbA1c over and above diabetes-specific variables argues for the relevance of studying general abilities such as self-control and emotional processing in teenagers with type 1 diabetes to explain the findings. These findings show that emotional processing, self-control, and their combination access a critical teenage HbA1c management capability that is presently not being touched by routinely used diabetes management tools. Adolescents with high self-control appear to be able to compensate for their lack of emotional understanding, maybe through better reasoning, cognition, or behavior management (e.g., having the self-discipline to check blood sugar, which avoids parents reminding and the subsequent anger this could produce). These findings elucidate the importance of both emotional processing and self-control for adolescents with T1D (25,26).

The study is limited by several shortcomings due to the distinctive characteristics of T1D in children. Therefore, obtaining participants may be challenging. This study has limitations because of its quasi-experimental design and purposive sample. In addition, we were unable to control intrusive variables, which we hope to address in future research.

Conclusions

To the best of our understanding, emotion regulation training was a program aimed at improving teenagers' emotional talents rather than reducing depressive symptoms. Despite attempts to create and assess educational programs for children and adolescents with T1DM, few appear to have an impact on their emotional abilities.

Many programs assess depressive symptoms as outcomes, but they do not give specific emotional skills training. Working with teenagers and young adults on the development and use of emotional abilities might be a valuable method for helping T1D patients manage well with their condition. Effective emotional regulation strategies can help people feel more in control of their situation, which is linked to increased well-being.

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Conflict of Interest

There are no conflicts of interest declared by the authors.

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