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The Effectiveness of Psychological Well-being Training on Optimism and Self-care Behaviors in Adolescents with Type 1 Diabetes

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Quantitative Study

Abstract

Background: Today, health psychologists seek to improve the performance of patients with type 1 diabetes and increase their well-being through increasing their adherence to self-care behavior. The purpose of this study was to determine the effectiveness of psychological well-being on optimism and self-care behaviors in patients with type 1 diabetes.

Methods: The current study was a quasi-experimental study with a pretest-posttest design and a control group. The statistical population included all adolescents with type 1 diabetes who were members of the Bandar Abbas Diabetes Association in 2022. Through purposeful sampling, 30 adolescents with type 1 diabetes were selected and randomly (odd and even numbers) divided into intervention (15 participants) and control groups (15 participants). Psychological well-being education was presented to the experimental group in 10 weekly 90-minute group sessions. In contrast, the control group did not receive any interventions. The research tools include the Revised Life Orientation Test (LOT-R) (Shier & Carver, 1985) and Revised Diabetes Self-Management Questionnaire (DSMQ-R) (Tolbert et al., 2000). Multivariate analysis of covariance (MANCOVA) was used in the current study ($P < 0.05$). All statistical analyses were performed in SPSS software.

Results: Psychological well-being training significantly increased optimism ($F = 25.43$; $P < 0.001$) and self-care behaviors ($F = 29.76$; $P < 0.001$).

Conclusion: It can be concluded that psychological well-being intervention was beneficial for patients with type 1 diabetes, and it showed promising effects on clinically relevant outcomes.

Keywords: Psychological well-being; Optimism; Self-care; Type 1 diabetes

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Introduction

Diabetes type 1 is also known as insulin-dependent diabetes or juvenile diabetes (Khan, Cuda, Karere, Cox, & Bishop, 2022). Type 1 diabetes in young and adolescent people may be associated with adverse medical and psychological consequences such as unfavorable self-management (decreased physical activity, inappropriate eating habits, medication management, and irregular blood sugar control), increased hemoglobin, and frequent and severe hypoglycemia, which decreases the general well-being of diabetic patients (Rutters, Elsman, Groeneveld, Langendoen-Gort, Mokkink, & Terwee, 2022). Based on the statistics and published numbers, a growing number of Iranians are suffering from diabetes, which demonstrates the need to educate the public about lifestyle modification, healthy diet, and physical activity (Delpisheh, Firouzkouhi, Rahnama, Badakhsh, & Abdollahimohammad, 2022). The problem of people with type 1 diabetes in Iran is the lack of a suitable platform for timely recognition and provision of preventive and cognitive solutions for the treatment and improvement of the condition (Jafarvand, Ataey, & Edalati, 2021). The lack of sufficient knowledge when facing its symptoms and treatment strategies for children and adolescents in society, in addition to the traumatic perspective of the physical aspect of treatment, is suggestive of the weakening of the psychological dimension of people involved with this disease, which causes the diminishing of the psychological mechanism (Kulzer et al., 2021). For young people and teenagers to become more empowered in forming their individual and social identities in light of biological phenomena, subjective mental processes are used, and they are reliant on them helpfully and effectively so that they contribute meaningfully to the advancement of treatment and the improvement of patient's mental state (Kalra et al., 2021).

Since this disease is an autoimmune disease, there is no definitive treatment for it, but with the correct use of prescribed drugs, a suitable diet, and lifestyle control, normal and natural conditions can be achieved (Khan et al., 2022). Previous researches have shown that mechanisms that promote self-awareness improve psychological optimism in type 1 diabetics, and thus, speed up the treatment process (Gonzalez-Alonso & Manso, 2022). In improving patients' conditions, the most effective component has been creating practical psychological well-being in people's mentality and attitude (Jahan & Nematolahi, 2021). The concept of psychological well-being, derived from positive psychology, emphasizes introspection and positive and constructive interactions with others through a structured, organized, goal-directed, and problem-oriented approach (Bassi, Gabrielli, Donisi, Carbone, Forti, & Salcuni, 2021). In this psychological mechanism, the six vertices are mastering the environment, personal development, purposeful living, autonomy, self-acceptance, and positive relationships with others, all of which contribute to psychological well-being and a change in attitudes and opinions. This mechanism stimulates self-awareness, improves mood disorders, and strengthens behaviors that promote psychological well-being. The overview of the research shows that this method has a positive effect on the mental system of patients as well as on their overall health (Shams, Heydari, & Fakhri, 2020).

For this purpose, appropriate intervention methods are required that raise optimism and self-care behaviors. Among the procedures related to effective psychological mechanisms, one can create a mentality in order to create psychological well-being productively and an optimistic approach that ultimately increases self-care based on a mental system founded on positive psychology. Ajele, Babalola, Idehen, and Oladejo (2022) tried to balance different psychobiological components in a

person. Previous studies have shown a relationship between the increase in the health deterioration status of diabetic people and the decrease in their level of optimism. Diabetic patients are more likely to suffer from depression, anxiety, frailty, and a desire to change the situation (Wade, Burton, Akinseye, Nelson, Smith-Young, & Kim, 2022). Stabilizing patients' recovery conditions requires approaches related to psychological well-being that create and influence a better mental state (Ware et al., 2022).

Performing exercises related to psychological well-being that create optimism and self-care, increases people's knowledge and awareness of their characteristics and abilities, their attention to the body, and their ability to control their negative thoughts. According to the concepts presented in this aspect of psychological well-being and as it creates elements that generate optimism and manifest self-care incrementally, this method can be expected to reduce the negative effects of diabetes in the developing psychological structure of teenagers and young adults (Schrauben et al. 2020). Considering the condition of diabetes, which is chronic, and its high prevalence in societies that is an intrapersonal threat, this study was conducted with the aim to determine the effectiveness of psychological well-being on optimism and self-care behaviors of people with type 1 diabetes and achieve a practical solution in this area.

Methods

The current study was performed with a quasi-experimental and pretest-posttest design, and a control group. The statistical population included all adolescents with type 1 diabetes who were members of the Bandar Abbas Diabetes Association, Bandar Abbas, Iran, in 2022. Through purposeful sampling, 30 adolescents with type 1 diabetes were selected and randomly divided into intervention (15 people) and control groups (15 people). The sample size was determined using Cohen's sampling table, with an effect size of 0.4 and a test power of 0.7.

The study inclusion criteria included type 1 diabetes diagnosed by an internist or endocrinologist, age range of 13-18 years, not taking neuroleptics and sedatives, not taking part in educational or other treatment workshops, and providing an informed consent. The exclusion criteria included absence from more than 2 intervention sessions, unwillingness to continue cooperation, and diabetes complications (heart palpitations, sweating, paleness, anxiety, etc.). The selected patients had similar drug treatments and continued their drug treatments during the research. To collect data, after obtaining the necessary permits, coordination was made by the Bandar Abbas Diabetes Association for the implementation of the research, and then, the participants were selected by contacting the families of these teenagers, explaining the purpose of the research, and obtaining parental consent based on the criteria. The participants of the sample study were informed that all of them should come to the psychological center of Tavalode Dobare at the appointed time in District 4 of Bandar Abbas. I should note that while implementing this study, the researchers paid the travel expenses of the participants to encourage them to take part in the research. To carry out the research, the patients were introduced to the work process during a meeting, and explanations were given to them about the goals and methods of the research. Moreover, they were assured that their personal information would remain confidential and would be used for research purposes only. Then, a written informed consent form was obtained from teenagers with type 1 diabetes, and they were placed randomly in the experimental and control groups.

In the experimental group, the psychological well-being intervention was

implemented in 10 weekly sessions of 90 minutes in a group at the mentioned center by a clinical psychologist (the content of the sessions is presented in table 1), but the control group did not receive any interventions. Subjects of both experimental and control groups completed the Revised Life Orientation Test (LOT-R) and Revised Diabetes Self-Management Questionnaire (DSMQ-R) in two stages, pretest and posttest.

Revised Life Orientation Test: The LOT-R was designed for the first time in 1985 by Shier and Carver to assess individual differences in general optimism and pessimism. The original form of this test included 12 questions. This test was revised in 1994 by Shier, Carver, and Bridges into a 10-question test. The items of the LOT-R are scored on a 5-point Likert scale ranging from 0 (completely disagree) to 4 (completely agree). The total score of optimism is obtained by summing the scores of the questions. Higher scores on the LOT-R indicate higher optimism. The items 4, 1, and 10 are named as positive, items 3, 7, and 9 are named negative, and items 2, 5, 6, and 8 are named as deviant items. According to Shier et al. (1994), these items are designed only to test the participants' accuracy in responding to the tool and are not calculated in the scoring process of the test. To achieve the overall score, 3 negative questions are scored inversely. The total score of this scale ranges from 4 to 21. In the present study, the internal consistency coefficient of the LOT-R was 0.76.

Revised Diabetes Self-Management Questionnaire: Tolbert et al. created the DSMQ-R in the year 2000. This tool has 15 items, one item is scoreda as 0, and the other 14 items are scored using an 8-point Likert scale ranging from 0 to 7. The total score of the scale is the sum of the scores of the items, so it ranges between 0 and 99, and higher scores indicate more self-care behaviors. Tolbert et al. (2000) confirmed the construct validity of the instrument using the factor analysis method and reported its reliability with an alpha method. Moreover, Mahdilouy and Ziaeirad (2019) calculated the reliability of the instrument to be 0.78 using Cronbach's alpha method. In this study, the reliability value of the DSMQ-R was calculated using Cronbach's alpha ($\alpha = 0.87$).

Table 1. Content of the psychological well-being educational intervention

Sessions	Content
First	Introducing and creating familiarity, explaining the reason for the existence and efficiency of this mechanism, examining the opinions of people about the reasons for happiness and well-being
Second	Teaching self-acceptance, recognizing flaws and accepting psychological positives and negatives, and creating a generator for self-interest to create optimism and self-care
Third	Creating self-awareness and self-awareness, self-knowledge, and correct attitude towards oneself, communicating with the personal components of personality
Fourth	Creating a positive communication process by relying on the concept of positive communication, and explaining communication skills and communication methods
Fifth	Extending positive relationships with others based on the concept of optimism and creating collective mental well-being, and trusting your emotional intelligence to increase social relationships and increase individual empowerment
Sixth	Investigating emotional intelligence as a productive factor of collective communication, and how to use it in different aspects of life
Seventh	Teaching independence and personal autonomy in making decisions, teaching the skill of saying no, and strengthening positive communication skills
Eighth	Examining the concept of personal growth, and teaching it through learning from others' experiences
Ninth	Management training on personal growth through examining environmental elements, and explaining the benefits and effects of time management in creating self-care and its interaction with optimism
Tenth	Explaining the importance of being purposeful through finding or creating meaning, suitable direction in life, and explaining, defining, and setting priorities in life

The collected data were analyzed using analysis of variance (ANOVA) in SPSS software (version 23; IBM Corp., Armonk, NY, USA). The significance level of the tests was considered to be 0.05. Moreover, to determine the significance of the difference between test and evidence scores of the dependent variables of optimism and self-regarding behaviors of people with diabetes, multivariate analysis of covariance (MANCOVA) was used.

Results

The present study was conducted on 30 adolescents with type 1 diabetes. The mean (SD) age of the participants in experimental and control groups was 17.26 (8.24) and 17.14 (6.36) years, respectively. Moreover, 49% of the participants were girls and 51% were boys. The mean and SD of stress and anxiety for teachers of students with intellectual disabilities in the study groups are mentioned in table 2.

The presence of more than 1 dependent variable requires the use of multivariate methods. Before analyzing the data related to the hypotheses, to ensure that the data of this research meets the underlying assumptions of ANCOVA, they were examined. In this research, the pretest scores of optimism and self-care behaviors of people with diabetes were considered auxiliary variables (covariates), and their posttest scores were considered dependent variables. The linearity of the relationship between each dependent variable and its covariate was tested. The linear significance level of the relationship between the pretest and posttest scores of the patients' optimism ($r = 0.59$) and self-care behaviors ($r = 0.68$) was obtained (both correlation coefficients are significant at the $P < 0.05$ level). According to the obtained data, the assumption of linearity is established for both variables of optimism and self-care behaviors of people with diabetes. In this research, Levene's test was used to check the homogeneity of the variance of the variables before analyzing the data. It approved the homogeneity of variances (Levene's) tests related to the dependent variables of the research (optimism and self-care behaviors). Levene's test was insignificant in the variables of optimism ($F = 0.75$; $P = 0.19$) and self-care behaviors ($F = 0.84$; $P = 0.14$). As a result, the assumption of homogeneity of variances is confirmed. Furthermore, the significance level of the Kolmogorov-Smirnov test was greater than 0.05, so they have met the assumption of normal distribution of the variables.

There was a significant difference between the experimental and control groups in terms of the dependent variables ($P < 0.001$). Thus, at least one of the dependent variables differs significantly between the two groups (optimism and self-care behaviors). In MANCOVA text, 2 covariance analyses were conducted to determine this difference. In the experimental and control groups, 70% of the variances are explained by the independent variable, based on the calculated effect size (Table 3).

Table 2. The mean and standard deviation (SD) of stress and anxiety for teachers of students with intellectual disabilities in the experimental and control groups

Variable	Groups	Stages	Mean ± SD
Optimism	Pretest	Experimental	15.27 ± 2.14
		Control	14.81 ± 2.36
	Posttest	Experimental	22.45 ± 3.34
		Control	15.74 ± 3.09
Self-care behaviors	Pretest	Experimental	25.19 ± 4.37
		Control	26.71 ± 4.65
	Posttest	Experimental	37.81 ± 12.5
		Control	27.43 ± 4.67

SD: Standard deviation

Table 3. Results of multivariate analysis of covariance on variables

Statistical Test	Value	F	df	df error	P-value	Effect size
Pillai's Trace	0.913	81.46	2	28	0.001	0.70
Wilks' Lambda	0.129	81.43	2	28	0.001	0.70
Hotelling's Trace	8.17	81.43	2	28	0.001	0.70
Roy's Largest Root	5.65	81.43	2	28	0.001	0.70

df: Degree of freedom

According to the contents of table 4, the F value for the optimism variable was 25.43, which is significant at the P < 0.001 level. Furthermore, according to the contents of table 4, the F-value for the self-care behavior variable was 29.76, which is significant at the P < 0.001 level. In addition, it can be seen that the largest effect size is related to the optimism variable (0.741), which shows that 74% of the total variation in optimism in the experimental and control groups is due to the effect of the independent variable (psychological well-being). The small effect size is related to self-care behaviors (0.659), which shows that 65% of the total variances of the experimental and control groups in the self-care behaviors of people with diabetes is caused by the effect of the independent variable (psychological well-being).

Discussion

Based on the findings of this research, psychological well-being is effective on the variables of optimism and self-care behaviors. A psychological mechanism is created based on a positive theory and a well-being approach, and this creates an optimistic attitude, thus strengthening self-care behaviors, which is consistent with the research by Gordon (2022), Shams et al. (2020), and Massey, Feig, Duque-Serrano, Wexler, Moskowitz, and Huffman (2019). The use of well-being interventions promotes optimism, positive affect, and resilience through exercises (letters of gratitude, acts of kindness, and using personal strengths) (Massey et al., 2019). Psychological well-being interventions may be appropriate for diabetic patients for several reasons; they target constructs (e.g., optimism and resilience) that are prospectively and independently associated with superior health outcomes in diabetes (Celano, Beale, Moore, Wexler, & Huffman, 2013).

The management of diabetes involves strict lifestyle changes, including a healthy diet, regular exercise, and monitoring blood sugar levels. It is possible to improve self-care through well-being interventions that increase motivation and self-efficacy. Furthermore, many well-being interventions are simple for patients and can be performed or assigned by doctors without the need for intensive training (Massey et al., 2019). Lukasiewicz, Kiejna, Cichon, Jodko-Modlinska, Obrebski, and Kokoszka (2022) also emphasized the decrease in optimism and self-care in people with diabetes and presented a solution to increase positive performance to create positive psychological mechanisms. In previous researches, psychological interventions based on the components of psychological well-being have generally been viewed as positive, In these interventions, the creation of mental order is attempted in order to improve the condition of patients.

Table 4. The results of the analysis of covariance on the mean posttest scores of optimism and self-care behaviors

Dependent Variables	Source	SS	df	MS	F	P-value	Eta
Optimism	Group	176138	1	176138	25.43	0.001	0741
Self-care behaviors	Group	9154.25	1	9154.25	29.76	0.001	0.659

SS: Sum of Squares; df: Degree of freedom; MS: Mean squares

However, in some articles such as that by Resende, Teodoro, Barros, & Ohno (2021), because of the social background of the target society, the inability to create suitable conditions for applying the components of the experiment, and the psychological conditions of some individuals in the experimental groups, applying such a strategy did not help improve diabetic patients' condition meaningfully. This inconsistency in results may be due to the insufficient amount of meetings held, as in the present research, the experimental group took part in 10 90-minute meetings and also by holding tests and sessions of mutual thinking and overlapping to maintain psychological coherence, they made the treatment process; but in the mentioned research, the number of sessions was reduced to 6 sessions of 90 minutes.

Based on the scientific structure of psychology, in psychological interventions that generate optimism and a positive approach, and perform self-care tasks, conducting multiple psychological sessions is an important factor in accelerating and improving the performance of therapy sessions (Massey et al., 2019). Thus, it can be concluded that this contradiction has arisen in the results due to the higher number of treatment sessions of the present study compared to the asymmetric research.

In the topic of psychological well-being, which takes an active and positive step by creating self-awareness and self-acceptance, awareness about this matter with the approach generating internal motivation and their effective interaction with external motivations is a requirement, and leads to the creation of effective results at the end of events related to this approach. In general, when considering the structure of psychological optimism, several factors are always taken into account to define optimism, each directly is related to people's attitudes toward problems. However, in this topic, a person faces the disease with an optimistic attitude (Selanov et al. 2013), and based on the outcome automatically creates better and more beneficial circumstances in the treatment process than a person suffering from this disease without this attitude.

Psychological well-being has a direct relationship with understanding and receiving the concept of happiness in life. Happiness refers to a state in which a person interacts with all aspects of his/her life in an interactive and balanced way and can achieve a sense of satisfaction from his/her life phenomena through self-awareness and sufficient knowledge of life. Since psychological well-being has a direct relationship with the concept of happiness in people's lives, performing self-care behaviors to create order and maintain the status of the components related to the individual's personal and social life directly increases the quality of the individual's satisfaction in life (Gonzalez-Alonso & Manso, 2022).

The most important limitations of the current research were the small number of the studied population and the lack of follow-up of the results and extension of the psychological treatment process until the ultimate recovery of the participants. Moreover, the study community was limited to one city; the type 1 diabetes investigation was carried out in a psychological center in Bandar Abbas. Therefore, the use of follow-up steps, increasing the statistical comprehensiveness, performing the study in other cities, and applying different cultural structures by using flexible questionnaires is recommended in future studies. Furthermore, considering the influential factor of gender and its critical role in the formation of the psychological personality of people, it is recommended that training and testing be done separately by gender.

Conclusion

The results of the research show that performing self-care activities and creating an optimistic mechanism in a diabetic individual improves his/her mental health, reduces the effects of the disease, and increases hope and mental well-being. Therefore, people in interaction with diabetic individuals, including therapists, psychologists, doctors, nurses, and the individual him/herself and his/her family, will take a step forward in the direction of positive mental and physical progress by applying these mechanism.

Conflict of Interests

Authors have no conflict of interests.

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