

The effects of a life skill-based intervention on mental health of adolescents and young adults with type 1 diabetes

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Abstract

Type 1 diabetes is one of the most common chronic diseases among adolescents and youth. This study examined the effectiveness of a life skills training intervention on the psychological health of adolescents and young adults with type I diabetes. This quasi-randomized controlled trial recruited 80 patients from the West Azerbaijan Diabetes Community. Participants were randomly allocated to intervention (n=40) or control (n=40) groups. The intervention group received nine sessions of life skills training, and the control group received routine care only. Data collection tools consisted of a demographic questionnaire and the DASS-21. Compared to the control group, intervention group participants achieved statistically significant improvements in their psychological health, including stress ($p < 0.04$), anxiety ($p < 0.04$), and depression ($p < 0.03$). Nurses, including diabetes educators, should assess diabetes patients for psychological complications, and consider empowering adolescents and young adults with diabetes through life skills training, which can be incorporated into diabetes management plans to promote their health and wellbeing.

Keywords: Type 1 diabetes, stress, anxiety, depression, life skills training

INTRODUCTION

Diabetes is a chronic metabolic condition, with a significant global burden. In 2017, approximately 451 million people (age 18-99 years) were living with diabetes worldwide, and there is a projection that this figure will reach 693 million by 2045 ([Cho et al., 2018](#)). Type 1 diabetes is one of the most common chronic diseases among children and adolescents. According to the SEARCH for Diabetes in Youth Study (SEARCH), approximately 191,986 youth (aged <20 years) lived with physician-diagnosed diabetes in 2009 in the United States, of whom 166,984 were diagnosed with type 1, 20,262 with type 2, and 4,740 with other types of diabetes. Compared to data from 2001, the number of diabetes cases increased in 2009, primarily due to a rise in type 1 diabetes, which increased in race/ethnic groups, particularly among Native American and black youth ([Pettitt et al., 2014](#)). The rise in diabetes rates is of more significant concern in the middle- and low-income countries. The Middle East and North Africa have an alarming rise in diabetes; it is estimated that the number of diabetes cases in the region will double to reach 72.1 million by 2040 ([International Diabetes Federation, 2015](#)). Iran is one of the countries in the region with the largest number of diabetes patients ([International Diabetes Federation, 2015](#)). These figures imply the magnitude of the impact that diabetes can have on healthcare expenditure, productivity, and mortality globally, both currently and in the future.

Type 1 diabetes is characterized by a deficiency in insulin production, a condition, which is not preventable or curable. Patients are, therefore, dependent on exogenous injected insulin to prevent diabetes complications, such as heart attack, stroke, blindness, kidney failure, and lower limb amputation. The chronic nature of the disease and the seriousness of the complications can have a significant mental health impact on patients ([Hilliard et al., 2016](#)). This can be particularly problematic in adolescents and youth who also experience significant physical and emotional changes

due to their age and are highly vulnerable to high-risk behaviors, such as smoking and drug and alcohol abuse ([Peeters et al., 2019](#)). The prevalence of serious psychological distress is estimated at the rate of 7.6% in people with diabetes, while this rate is 3.6% in the general population. These patients are also at higher risk of developing depression compared to the general population (20% vs. 5%) ([World Health Organization, 2017](#)), and are more likely to have sexual and relationship problems ([Piątkiewicz et al., 2017](#)). Other than affecting the wellbeing and quality of life of patients, poor mental health can adversely affect diabetes management, with several studies demonstrating significant associations between psychological distress and poor glycemic control ([Balhara, 2011](#)). On the other hand, poor glycemic control increases the risk of diabetes complications and adversely affects the mental health of the patients ([Ziba et al., 2017](#)). This vicious cycle continues to affect the quality of life of diabetic patients, and results in disability, increased use of services, and early mortality ([Balhara, 2011](#); [Vala et al., 2016](#)). Therefore, the integration of mental health into diabetic patients' care plans can be an important step towards improving the outcomes for this patient group ([Moayedi et al., 2014](#)). Up until now, however, evidence shows that mental health issues in diabetes patients are often poorly managed, even in well-resourced health-care systems ([Wylie et al., 2019](#)). It is important that mental health issues of patients with diabetes are identified using appropriate screening tools, and practical strategies are developed and implemented in practice to reduce the burden of mental health problems in diabetes. One strategy that may help reduce this burden is the training of life skills to people living with diabetes, particularly adolescents and young adults. These interventions aim to increase the adaptability skills of individuals and prevent behavioral and mental health problems. World Health Organization (WHO) defines life skills as “the abilities for adaptive and positive behaviors that enable individuals to deal effectively with the demands and challenges of everyday life” ([World Health Organization, 1994](#)). According to WHO, life skills training should focus on the following ten skills: self-awareness, effective communication, interpersonal relationship, decision making, problem-solving, creative thinking, critical thinking, empathy, and coping with emotion and stress ([Sobhi-Gharamaleki & Rajabi, 2010](#)). These skills enable individuals to have

better control over everyday problems and enhance the manageability of and adaptability to adverse conditions such as disease experience ([Ghasemian & Kumar, 2017](#); [Ndetei et al., 2019](#)). Several studies have shown that life skills training is effective in reducing substance abuse, preventing violent behavior, improving self-esteem, and increasing individuals' coping abilities ([Jamali et al., 2016](#); [Sobhi-Gharamaleki & Rajabi, 2010](#); [Weichold & Blumenthal, 2016](#)). In patients with diabetes, life skills education was found useful in improving mental health, and quality of life of the patients ([Abualula et al., 2016](#); [Ziba et al., 2017](#)). As a significant number of diabetic people suffer from mental problems, preventing, monitoring, identifying, and timely treatment of these debilitating comorbidities may improve the psychological wellbeing of the patients and positively affect diabetes outcomes. This study aimed to evaluate the effectiveness of a life skill training program on the psychological health of adolescents and youth with type 1 diabetes.

METHODS

This quasi-randomized controlled trial is registered with XXX. Participants were recruited from the West Azerbaijan Diabetes Community. Inclusion criteria included: having a diagnosis of type I diabetes, being referred to the West Azerbaijan Diabetes Community, aged between 12-30 years, willing to participate in the study, and having physical and mental ability to complete the study questionnaires and participate in life skills training sessions. Patients were excluded from the study if they had severe diabetes complications needing frequent hospitalizations, participated in a life skills education program within the last six months, had severe mental disease, such as psychotic disorders, alcohol or drug addiction, or a comorbid chronic or acute medical problem, such as convulsion, skeletal disorders, or cardio-respiratory disorders. In addition, patients who were experiencing a significant stressor, resulting from unforeseen events or died during the study, were excluded. The required sample size for each arm was calculated to be 36, based on the results of a previous study, reporting the mean scores and standard deviations of anxiety before and after implementation of a life

skills training program as 2.02 ± 0.05 and 1.82 ± 0.48 , respectively ([Khani et al., 2014](#)). Considering the possibility of dropout, 40 participants were recruited for each study arm. A convenience sample of patients who attended the Diabetes Community was screened against the study inclusion and exclusion criteria. Those who met the criteria received information about the study's aims and objectives, the number of sessions, duration of the sessions, location, as well as the voluntary basis of the research, and they were invited to participate in the study. Interested patients signed a written consent form. The study received ethical approval from the Ethics Committee of the Research Center in Uremia. Participants were allocated into intervention (n=40) or control (n=40) groups using a quasi-randomization method. Allocations were written on pieces of paper, which were then folded and placed into a box. Once the screening was completed for each participant, they were asked to pick an allocation from the box.

Study Instruments

Participants in both groups completed the study instruments at baseline and after the intervention. The instruments consisted of a sociodemographic questionnaire and the stress, anxiety, and depression scale (DASS-21). The DASS-21 is comprised of 21-items and three subscales of depression (7 items), anxiety (7 items), and stress (7 items). Response to each item is rated on a 4-point Likert scale, with the scores ranging from 0 (did not apply to me at all- never) to 3 (applied to me most of the time- almost always).

The total sub-scores can be obtained by summing up the scores of the relevant items ([Lovibund & Lovibund, 1995](#)). The validity and reliability of the DASS-21 have been well confirmed on both clinical and non-clinical populations ([Nordin et al., 2017](#); [Saricam, 2018](#)). Likewise, the validity of the Persian version of the scale has been evaluated on a sample of 1070 Iranian participants, with the reported Cronbach's Alphas of 0.77 for depression, 0.79 for anxiety, and 0.78 for stress subscales. The item analysis and criterion validity of the Persian version of the scale has also been confirmed ([Sahebi et al., 2005](#)). In the current study, Cronbach's Alpha coefficients for depression, anxiety, and

stress subscales, and the entire scale were 0.81, 0.88, 0.86, and 0.83, respectively.

Participants in both groups received routine services provided through the Diabetes Community. The intervention group received an additional life skills training (LST) program, which aimed to empower adolescents and young adults with diabetes to deal effectively with the demands and challenges of their everyday life. Informed by the WHO's life skills education program for children and adolescents in schools ([World Health Organization, 1994](#)), and the literature on the needs of diabetic patients, the program aimed at enhancing participants' self-awareness of their body cues that signify different levels of glycemia as well as improving their problem solving, stress management, and communication and interpersonal skills. The summary of the program was presented in Table 1. The programs focused on the skills that were relevant to patients with diabetes, avoiding the overwhelming of the participants. The intervention was provided in small groups (4-7 participants in each group). Separate groups were formed for adolescents and young adults to encourage peer interactions and accommodate their learning needs and abilities. The intervention was provided in nine sessions on a weekly basis, and each session lasted approximately 90 minutes. The sessions were held in the Diabetes Community and arranged from 5:30 pm to 7:00 pm to allow for more participants to attend the sessions after work. In the first session, the program was introduced, and an overview of the sessions provided. In the other sessions, the first 15 minutes were allocated to an overview of the previous session, 45 minutes to presenting new skills, and the last 30 minutes to recapping the skills trained and addressing the participants' questions and comments. The training was provided by a clinical psychologist and the first author who had vast experience in delivering life skills training. A combination of teaching and learning strategies were applied to enhance learning, such as using group discussions, thinking challenges, scenarios, role modeling, and storytelling. Post-intervention assessments were completed two months after completion of the program. Participants in the control group received the training manual after completing the study.

Data analysis

Data were analyzed using the SPSS Ver. 16. The demographic characteristics of the participants were

summarized using frequencies and percentages. Between-groups differences were examined using Chi-square and Fisher exact tests for categorical data and independent t-test for continuous variables. The paired t-test was used to compare intragroup differences.

RESULTS

The baseline characteristics of participants in the intervention and control groups were summarized in Table 2. The groups were homogeneous in demographic characteristics, history of diabetes, and psychological status at baseline. The mean age of the participants in intervention and control groups were 24.08 ± 8.35 and 23.15 ± 6.33 years ($p=0.06$), and they had diabetes disease for an average of 12.28 ± 5.76 and 12.87 ± 5.59 years, respectively ($p=0.06$).

The mean depression, anxiety, and stress scores were compared before and after the intervention between groups and intra groups. As seen in Table 3, there were found no statistically significant differences in mean depression ($p=0.08$), anxiety ($p=0.08$), and stress ($p=0.06$) scores between intervention and control groups at baseline. After the intervention, however, the groups were statistically significant in mean depression ($p=0.04$), anxiety ($p=0.04$), and stress scores ($p=0.04$). The results of paired t-tests showed that improvements from baseline were statistically significant for the intervention group in all subscales of depression ($p=0.00$), anxiety ($p=0.00$), and stress ($p=0.02$), but no statistically significant improvements were observed for the control group.

DISCUSSION

This study was carried out to examine the effects of a life skills training intervention on the psychological health of adolescents and young adults with type 1 diabetes. This is an important topic to address, as the risks of adjusting problems and psychiatric disorders are higher in people with diabetes, issues that affect patients' wellbeing, and management of diabetes ([Balhara, 2011](#)).

Evidence-based interventions that aim to enhance adapting strategies and physiological health of diabetic patients are essential to improve the disease and patient outcomes. In our study, adolescents

who received the life skills training program showed substantial gains in mental health, including depression, anxiety, and stress scores. These results are consistent with the findings of previous research demonstrating beneficiary effects from these types of programs for patients with diabetes. Khani et al. (2014) examined the effects of a life skills training program on psychological indicators and the quality of life of diabetic patients. They found that the program improved participants' anxiety, depression, somatization, mental health, quality of life and satisfaction with their physical and mental health ([Khani et al., 2014](#)). Besides, a life skills training program consisting of 10, 90 minute sessions was effective in enhancing the happiness and hopefulness of patients with type II diabetes ([Shirkavand et al., 2015](#)). This is an important finding, as improved mental health has been linked to better self-care behaviors and diabetes management. Several studies have shown that stress management interventions lead to better glycemic control in patients with type 1 and type 2 diabetes ([Attari et al., 2006](#); [Hamid, 2011](#)). In resource-limited health care systems, where the delivery of full life skills training is not practical due to financial and human resources limitations, components of these programs can be adopted to help patients with diabetes to adjust to their condition. Grey et al.'s (1999) study focused on training effective coping strategies for adolescents with diabetes. This study aimed to increase the sense of competence and mastery of the patients through decreasing their ineffective coping strategies and increasing problem-solving skills and communication. At 6-month follow up, participants who received coping skills training demonstrated a better metabolic control and self-efficacy. They also perceived fewer worries about diabetes and less impact from diabetes on their quality of life ([Grey et al., 1999](#)). Programs that have focused only on stress management in diabetes patients have also shown promising results. Vala et al. (2016) found that mindfulness-based stress reduction group training was effective in reducing depression, anxiety, and stress of young women with type 2 diabetes. The training improved the participants' self-confidence, and led to a better hemoglobin A1C control ([Vala et al., 2016](#)).

Regardless of the compelling evidence demonstrating the benefits of psychological interventions for

patients with diabetes, the results of a survey showed that about one-third of physicians did not screen for psychological problems in this patient population and did not have access to mental health services for these patients. It is suggested that opportunities are provided in diabetes centers to implement life skill- based interventions to patients with diabetes in order to enhance their adjustment and mental health, improve glycemic control, and reduce the risk of diabetes complications. These types of interventions should be incorporated into the individual care plan of patients with all types of chronic diseases to help increase patients' self-care practices, adherence, and mental health and wellbeing.

Study limitations

The randomization method used in the study could have introduced selection bias; although the groups were similar in baseline characteristics, some unknown factors are likely to have unevenly distributed between the groups, affecting the study outcomes. Future research should apply more reliable randomization methods: for example, random number generator software. Also, we tested the effects of only four components of life skills training (self-awareness, problem-solving, stress management, and effective communication skills), training of patients on the full life skills may result in additional benefits.

CONCLUSIONS

Psychological distress is a common, but ignored problem among patients with diabetes. To improve the outcomes for these patients, health care providers, including diabetes nurses and diabetes educators, should assess the psychological status of diabetes patients during follow-up visits and intervene as appropriate. Nurses, including diabetes educators, should consider empowering adolescents and young adults with diabetes through life skills training, which can be incorporated into diabetes management plans to promote their health and wellbeing. Future research should evaluate the effectiveness of life training skills on the prevention of psychological complications, glycemic control and quality of life of adolescents and young adults with diabetes.

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