

## ORIGINAL ARTICLE

# Psychological Predictors of Resilience in Parents of Insulin-Dependent Children and Adolescents

Mitra Edraki<sup>1,2</sup>, MS; Masoume Rambod<sup>1,3</sup>, PhD

<sup>1</sup>Community Based Psychiatric Care Research Center, Shiraz University of Medical Sciences, Shiraz, Iran;

<sup>2</sup>Department of Pediatric Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran;

<sup>3</sup>Department of Medical Surgical Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran

### Corresponding author:

Masoume Rambod, PhD; Community Based Psychiatric Care Research Center, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Postal code: 71936-13119, Shiraz, Iran

**Tel:** +98 71 36474258; **Fax:** +98 71 36474252; **Email:** rambodma@yahoo.com

**Received:** 8 November 2017    **Revised:** 17 February 2018    **Accepted:** 25 February 2018

### ABSTRACT

**Background:** Parents of insulin-dependent children and adolescents need resilience to continue their lives. The aim of this study was to determine the psychological predictors of resilience in parents of insulin-dependent children and adolescents.

**Methods:** This was a descriptive correlational study performed in 2016. One hundred and thirteen parents of children and adolescents with diabetes who referred to a diabetes clinic in Shiraz participated in this study. Convenience sampling was used. Depression Anxiety Stress Scales (DASS-21) and Connor-Davidson Resilience Scale (CD-RISC) (25 items) were also used. The data were analyzed by SPSS software version 20 using t-test, ANOVA, Pearson correlation coefficients, and linear regression analysis.  $P < 0.05$  was considered as significant.

**Results:** The findings showed that the mean $\pm$ SD score of resilience was  $65.33 \pm 23.81$  in parents of children and adolescents with diabetes. Indeed, 45.1% of the parents had mild to extremely severe levels of stress. Besides, 58.4% and 71.4% of them reported mild to extremely severe depression and anxiety, respectively. The lowest mean $\pm$ SD scores of resilience were reported in parents with extremely severe levels of depression ( $37.57 \pm 16.26$ ), anxiety ( $44.89 \pm 23.53$ ), and stress ( $37.84 \pm 17.90$ ). Moreover, 49% of changes in resilience was explained by such factors as stress, anxiety, depression, and life and health satisfaction. Among these variables, the association between resilience and depression ( $t = -6.97$ ,  $P < 0.001$ ) and life satisfaction ( $t = -3.18$ ,  $P = 0.002$ ) were statistically significant.

**Conclusion:** Since nearly half of the parents experienced stress, depression, and anxiety, and there was an association between resilience and these psychological variables, parents' psychological problems, especially depression, might be reduced by improving their resilience.

**KEYWORDS:** Anxiety, Depression, Diabetes, Parents, Psychological resilience

**Please cite this article as:** Edraki M, Rambod M. Psychological Predictors of Resilience in Parents of Insulin-Dependent Children and Adolescents. *IJCBNM*. 2018;6(3):239-249.

## INTRODUCTION

Diagnosis of diabetes in children causes psychological problems in family life.<sup>1</sup> Parents of adolescents with diabetes deal with persistent worries about their children's blood sugar levels, health, growth, and development.<sup>2</sup> In fact, responsibility for managing diabetes causes stress, tension and obvious concerns as well as the risk of depression and anxiety in parents of children with type I diabetes.<sup>3</sup> Although the results indicated that the parents of children with type I diabetes were at risk of depression, anxiety and stress,<sup>4</sup> few studies have determined the prevalence of these psychological issues. For example, in one study, the prevalence of depression in parents with a diabetes type 1 child was 75%.<sup>5</sup> Therefore, more research is needed to determine the prevalence of some psychological issues such as depression, anxiety and stress in the parents of children and adolescents with type I diabetes.

Parental psychological issues cause complications in their children. Depression in adolescents' mothers led to an increase in treatment costs. It was reported that teenagers whose mothers suffered from depression were twice as likely to visit emergency centers and three times more likely to be hospitalized.<sup>6</sup> Maternal depression also reduced treatment adherence and blood glucose control in teenagers with type 1 diabetes.<sup>7</sup> In addition, parents' psychological distress affected diabetic children's management.<sup>3</sup> Researchers also revealed that stress in parents of children with type 1 diabetes was associated with depressive symptoms in children.<sup>8</sup> In fact, parental reactions had an effect on children's outcomes.<sup>4</sup> However, resilience as a promoting modifier could be effective in reducing distress and improving the outcomes of adolescents with type 1 diabetes.<sup>9</sup>

Resilience refers to the capacity to develop oneself successfully in face of adverse conditions.<sup>10</sup> It improves psychological coping,<sup>11</sup> and prevents mental health disturbance.<sup>12</sup> Resilience increases the individuals' bio-psycho-spiritual balance in risky conditions.<sup>13</sup> In

other words, it is used in successful adaptation in responses to environmental challenges and the deleterious effects of stress.<sup>14</sup> Parents with higher levels of resilience had better psychosocial functions in stressful situations.<sup>15</sup> It might be related to using strategies, including primary control coping (problem solving) and secondary control coping (acceptance) which were correlated to fewer depression and anxiety symptoms and family conflict in mothers of adolescents with type 1 diabetes.<sup>16</sup> On the other hand, individuals with low resilience experienced higher distress, poor quality of life, and poor glycemic control.<sup>9</sup>

Review of the literature on chronic diseases revealed that resilience was associated with depression and anxiety<sup>17</sup> and protected the individuals from these symptoms.<sup>18</sup> In a study on adolescents and young adults with type I diabetes, researchers found an association between resilience and anxiety and depression.<sup>19</sup> It was also reported that increasing adolescents' resilience reduced their depression, anxiety, and stress.<sup>20</sup>

Although the association between resilience and depression, anxiety, and stress has been proposed in the above-mentioned studies,<sup>17-20</sup> they were conducted on young adults and adolescents with diabetes,<sup>19</sup> those with other chronic conditions, or healthy adolescents.<sup>18, 20</sup> However, few studies have been conducted on the association between resilience and depression, anxiety, and stress levels in parents of children and adolescents with diabetes.<sup>21</sup> Moreover, low resilience and higher levels of depression, anxiety, and stress had many complications in the parents caring child and adolescence with diabetes.<sup>6, 9</sup> Moreover, no study has been conducted on psychological predictors of resilience in parents of type 1 diabetes. Therefore, this study aimed to determine the psychological predictors of resilience in parents of insulin-dependent children and adolescents.

## MATERIALS AND METHODS

This was a descriptive correlational study in

which resilience in parents of insulin-dependent children and adolescents was predicted. This study was performed in a diabetes clinic in Imam Reza Hospital affiliated to Shiraz University of Medical Sciences (SUMS) from April to July 2016.

The participants included all parents of children and adolescents diagnosed with diabetes at least one year ago. The inclusion criteria of the study were being Iranian, being 18 years old and above, having a child or adolescent with diabetes, and not having any acute diseases in the child requiring hospital admission during data collection. On the other hand, the parents whose children had birth defects, chromosomal or neurological disorders, and systematic diseases were excluded from the study. Parents who had dealt with emotional crises such as separation from their spouse and death of a close family member within the past six months, those whose children had a genetic or chronic disease as well as diabetes, and those who suffered from psychiatric disorders and used psychiatric drugs were excluded from the study, as well.

The study sample size was determined by a pilot study on 10 parents of children and adolescents with diabetes. Based on this pilot study, the correlation coefficient between among resilience and depression, anxiety, and stress were 0.261, 0.291 and 0.300, respectively. Therefore, based on  $\alpha=0.05$ ,  $b=0.90$  and,  $r=0.261$ , a 113-subject sample size was estimated. Convenience sampling was used to select the subjects.

The data were collected using the sociodemographic characteristics form and two questionnaires. In the form, some information about parental gender, marital status, maternal and paternal education level, maternal and paternal job, the number of child or adolescence' hospital admissions, the number of family members who suffered diabetes, the person who injects insulin, and life and health satisfaction were assessed. Life and health satisfaction was assessed by six-point Likert scale (very satisfied, moderately

satisfied, slightly satisfied, slightly dissatisfied, moderately dissatisfied and very dissatisfied).

The first questionnaire was Connor-Davidson Resilience Scale (CD-RISC) designed by Connor and Davidson in 1991-1997. This scale contained 25 items responded through a five-point Likert scale. Hence, its scores could range from 0 to 100, with higher scores representing more resiliency. This scale has been validated in several groups, such as general population, individuals who referred to primary care unit, and patients with generalized anxiety disorder and post-traumatic stress disorder. It also showed suitable psychometric properties.<sup>13</sup> Cronbach's alpha coefficient of the Persian version of the scale was reported to be 0.89 in stroke patients.<sup>22</sup> In the present study, face and content validities of the Persian version of the scale were approved by ten faculty members. Moreover, its test-retest and Cronbach's alpha coefficients were 0.92 and 0.96, respectively.

The second questionnaire was Depression Anxiety Stress Scales (DASS-21), which was designed by Lovibond and Lovibond in 1995. This scale consisted of 21 items responded through a 4-point Likert scale (0=never, 1=sometimes, 2=often, and 3=almost always). Thus, the scores could range from 0 to 63, with higher scores indicating higher levels of depression, anxiety, and stress. Each of the sub-scales of depression, anxiety, and stress was examined with seven items. Since the DASS 21 is a short form of DASS with 42 items, the final score of each subscale needs to be multiplied by two. Therefore, the score for each subscale was 0-42. The scores of depression, anxiety, and stress scales were classified into normal, mild, moderate, severe, and extremely severe categories (Table 1).<sup>23</sup> The construct validity of DASS was approved by Szabo.<sup>24</sup> Sinclair et al. also evaluated the psychometric properties of the scale in 503 adults in the US and reported Cronbach's a coefficients of 0.91, 0.81, and 0.84 for depression, anxiety, and stress subscales, respectively.<sup>25</sup> DASS has also been used in Iranian population and in patients with

**Table 1:** DASS severity rating

Severity	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely severe	>28	>20	>34

asthma. In a Persian study, Cronbach's alpha coefficient was 0.93 for the total scale and 0.81, 0.80, and 0.86 for depression, anxiety, and stress subscales, respectively.<sup>26</sup> In the current study, the face and content validities of the scale were approved by 10 faculty members of SUMS. In addition, test-retest reliability was 0.90 and Cronbach's alpha coefficients were 0.94, 0.86, 0.82, and 0.82 for the whole scale and depression, anxiety, and stress subscales, respectively.

The data collection was performed by a researcher assistant. She referred to the diabetes clinic in Imam Reza Hospital affiliated to SUMS and distributed the questionnaires among the subjects.

This study was approved by the Ethics Committee of SUMS (IR.SUMS.REC.1394s936, 94.11.10) and permission was obtained from Community-Based Psychiatric Care Research Center, SUMS, and Ethics Committee of SUMS. All of the subjects signed a written consent form. In the form, there was some information about the objectives, the subjects' activities, the times for filling out the questionnaires, and voluntary nature of the study. Confidentiality of information and anonymity were the other points considered in this study.

The data were analyzed using the SPSS statistical software, version 20. In order to determine depression, anxiety, and stress levels, we used descriptive statistics, such as frequency and percentage. Mean and standard deviation were also used for resilience. Moreover, the association between the study variables was assessed using t-test (comparing two mean scores), ANOVA (comparing more than two mean scores), and Pearson correlation coefficients (determining the association between the two quantitative

variables). Linear regression analysis was also used to determine the factors associated with resilience. The significance level was  $P < 0.05$ .

## RESULTS

This study was conducted on 113 parents. As shown in Table 2, the majority of the participants were mothers (62.4%) and 93.3% of the parents lived together. In addition, 48.5% of the mothers and 54.3% of the fathers had primary and secondary school degrees. Besides, 89.5% of the mothers were housewives and 38% of the fathers were self-employed. Additionally, 47.1% of the parents had a history of diabetes in their close relatives.

Diabetes in children and adolescents had been diagnosed averagely  $6.50 \pm 4.20$  years ago. Besides, on average,  $1.23 \pm 0.59$  children and adolescents suffered from diabetes in one family. In addition, the mean number of hospital admissions was  $1.25 \pm 0.50$  during the past six months. Insulin injections were mainly done by the parents (60%). Furthermore, 51.4% and 61.2% of the parents were highly and moderately satisfied with their lives and health, respectively (Table 2).

The mean  $\pm$  SD score of resilience was  $65.33 \pm 23.81$  in the parents caring for insulin-dependent children and adolescents with diabetes. Moreover, as seen in Table 3, 58.4% of the parents suffered from mild to extremely severe depression and 21.2% had severe and extremely severe depression levels. Also, 71.7% of the subjects experienced mild to extremely severe anxiety. In addition, 38.4% of the parents had severe and extremely severe anxiety levels. Besides, 45.1% of the parents reported mild to extremely severe stress levels (Table 3).

Based on the results presented in Table 4,

**Table 2:** Demographic characteristics of the parents caring for insulin-dependent children and adolescents

Variables		N (%)
Parental gender	Mother	68 (60.2)
	Father	41 (36.3)
	NA <sup>a</sup>	4 (3.5)
Marital status	Married	100 (88.5)
	Divorced and widowed	6 (5.3)
	NA <sup>a</sup>	7 (6.2)
Maternal education level	Primary and secondary schools	48 (42.5)
	High school and diploma	32 (28.3)
	Academic	19 (16.8)
	NA <sup>a</sup>	14 (12.4)
Paternal education level	Primary and secondary schools	49 (43.3)
	High school and diploma	25 (22.1)
	Academic	16 (14.2)
	NA <sup>a</sup>	23 (20.4)
Maternal job	Homemaker	85 (75.2)
	Employee	7 (6.3)
	Worker	3 (2.6)
	NA <sup>a</sup>	18 (15.9)
Paternal job	Unemployed	11 (9.7)
	Self-employed	35 (31.0)
	Employee	28 (24.8)
	Worker	18 (15.9)
	NA <sup>a</sup>	21 (18.6)
Person who injects insulin	Parents	56 (49.6)
	Child or adolescent	31 (27.4)
	Others	5 (4.4)
	NA <sup>a</sup>	21 (18.6)
Life satisfaction	Very satisfied	26 (23.0)
	Moderately satisfied	29 (25.8)
	Slightly satisfied	24 (21.2)
	Slightly dissatisfied	10 (8.8)
	Moderately dissatisfied	5 (4.4)
	Very dissatisfied	13 (11.5)
Health satisfaction	Very satisfied	30 (26.6)
	Moderately satisfied	38 (33.6)
	Slightly satisfied	14 (12.4)
	Slightly dissatisfied	5 (4.4)
	Moderately dissatisfied	7 (6.2)
	Very dissatisfied	17 (15.0)
	NA <sup>a</sup>	2 (1.8)

<sup>a</sup>Non Answer

**Table 3:** Levels of depression, anxiety, and stress in the parents caring for insulin-dependent children and adolescents

	Normal	Mild	Moderate	Severe	Extremely severe	NA <sup>a</sup>
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Depression	47 (41.6)	15 (13.3)	27 (23.9)	10 (8.8)	14 (12.4)	0 (%)
Anxiety	32 (28.3)	17 (15.0)	20 (17.7)	14 (12.4)	29 (25.7)	1 (0.9)
Stress	62 (54.9)	8 (7.1)	16 (14.2)	14 (11.5)	13 (11.5)	0 (%)

<sup>a</sup>Not Answered



parental gender and satisfaction with life and health were associated with the depression level. Accordingly, mild to extremely severe depression levels were more common among mothers who were less satisfied with their lives and health status. There was also an association between anxiety level and life satisfaction. Moreover, in the parents with normal stress levels, insulin injection was done by the child or adolescent, the number of hospital admissions was lower, and the parents were more satisfied with their lives and health statuses.

As shown in Table 4, resilience was associated with father’s job, number of hospital admissions, and satisfaction with one’s life and health. Accordingly, the highest and lowest mean scores of parental resilience were related to employed and unemployed individuals, respectively. Indeed, parents whose children had fewer admissions in the hospital had higher mean scores of resiliency. Resiliency was also higher in the individuals who were more satisfied with their lives and health (Table 4).

The study results revealed an association between resilience and depression, anxiety, and stress (Table 5). In other words, the parents who had normal and mild levels of depression, anxiety, and stress had higher resilience.

This study also showed an association

between depression, and anxiety ( $\chi^2=28.39$ ,  $P<0.001$ ). Moreover, depression was associated with stress ( $\chi^2=38.08$ ,  $P<0.001$ ). In addition, the correlation between anxiety and stress was statistically significant ( $\chi^2=20.83$ ,  $P<0.001$ ).

The variables which were associated to resilience including satisfaction with one’s life and health, father’s job, depression, anxiety, and stress were entered to linear regression analysis. Firstly, the adequacy of model for doing this analysis was approved by Durbin Watson test=2.2, Kolmogrov-Smirnovz=0.82,  $P=0.50$ , and Collinearity diagnosis (variance inflection factor (VIF)>2. Furthermore, the stability of variance was approved graphically. Then, backward linear regression analysis was used to determine the predictors of resilience. The results showed that 49% of changes in resilience were explained by such factors as depression, anxiety, stress, father’s job, and satisfaction with one’s life and health. The correlation coefficient between resilience and the above-mentioned variables was 0.70. Among these variables, the association between resilience and depression, and satisfaction with one’s life was statistically significant ( $P<0.05$ ). On the other hand, other variables including anxiety, stress, satisfaction with one’s health, gender, and father’s job were not associated with resilience ( $P>0.05$ ) (Table 6).

**Table 4:** The association between resilience, depression, anxiety, and stress and sociodemographic characteristics

	Resilience P value	Depression P value	Anxiety P value	Stress P value
Parental gender <sup>a</sup>	0.11*	0.04****	0.28****	0.05****
Maternal education level	0.81**	0.59****	0.21****	0.66****
Paternal education level	0.23**	0.32****	0.32****	0.05****
Maternal job	0.50**	0.16****	0.24****	0.36****
Paternal job	0.02**	0.32****	0.17****	0.20****
Marital status <sup>b</sup>	0.99*	0.86*	0.65*	0.76*
Income level	0.17***	0.19**	0.94**	0.56**
Family history of diabetes <sup>c</sup>	0.38*	0.95****	0.51****	0.55****
Child’s age at diagnosis	0.90***	0.19**	0.09**	0.06**
Length of diabetes diagnosis	0.35***	0.42**	0.89**	0.79**
Number of children with diabetes	0.72***	0.37**	0.20**	0.91**
Person who injects insulin	0.30**	0.88****	0.55****	0.04****
Number of child hospital admissions	0.03***	0.08**	0.08**	0.01**
Life satisfaction	$P<0.001$ **	$P<0.001$ ****	0.02****	0.001****
Health satisfaction	0.01**	$P=0.009$ ****	0.06****	0.001****

\*t-test, \*\* ANOVA, \*\*\*Pearson correlation, \*\*\*\* Chi square

**Table 5:** The association between resilience and depression, anxiety, and stress in the parents with insulin-dependent children and adolescents

Psychological variables	Resilience Mean±SD	P value*
Depression		
Normal	80.79±16.43	P<0.001
Mild	71.28±17.54	
Moderate	56.88±18.64	
Severe	50.60±28.39	
Extremely severe	37.57±16.26	
Anxiety		
Normal	80.37±17.84	P<0.001
Mild	77.62±17.41	
Moderate	65.40±20.02	
Severe	63.00±16.17	
Extremely severe	44.89±23.53	
Stress		
Normal	76.58±18.86	P<0.001
Mild	65.87±20.44	
Moderate	61.56±17.68	
Severe	48.21±24.81	
Extremely severe	37.84±17.90	

\*ANOVA

**Table 6:** The association between resilience and depression, anxiety, stress, life and health satisfaction, and father’s job in the parents with insulin-dependent children and adolescents

Model	Beta	t	P value*	R	R <sup>2</sup>
Depression	-0.58	-6.97	<0.001	0.70	0.49
Life satisfaction	-0.26	-3.18	0.002		
Excluded variables					
Anxiety	-0.17	-1.30	0.19		
Stress	-0.14	-1.08	0.28		
Health satisfaction	-0.14	-1.53	0.12		
Father’s job	0.05	0.67	0.50		

\*Linear Regression Analysis

**DISCUSSION**

According to the findings, the mean score of resilience was higher than the median score. Review of the literature revealed that few studies have been conducted on resilience among parents of children and adolescents with diabetes.<sup>19, 20</sup> Therefore, the results were compared to those of the studies on other chronic diseases, such as cancer. It was reported that parents of children with cancer had significantly lower levels of resilience in comparison to healthy children’s parents.<sup>27, 28</sup> Other Asian researchers also observed that parents of children with cancer had lower levels of resilience.<sup>15</sup> Chronic diseases,

such as diabetes, in children lead to several challenges and problems in parents, which might reduce their tolerance and resiliency.

The results of the present study showed that more than half of the parents met the criteria for mild to extremely severe depression. Indeed, roughly two-thirds of the participants experienced mild to extremely severe anxiety. In addition, approximately half of them suffered from mild to extremely severe stress. The results of a study indicated that upon diagnosis, parents of children with diabetes showed many depressive and anxiety symptoms. Accordingly, two thirds of the parents who participated in that study

had mild depression and sixty one percent of them suffered from clinically significant depression levels.<sup>4</sup> The parents of child with type 1 diabetes reported moderate level of depression.<sup>21</sup> Also, half of the participants felt clinically significant anxiety levels at the time of diagnosis.<sup>4</sup> A study on mothers of children with type 1 diabetes reported moderate and severe anxiety and depression symptoms in 43.3% and 16.7% of the participants, respectively. Generally, children's diagnosis with diabetes has negative impacts on the mothers' psychological aspects.<sup>29</sup>

In the current study, mild to extremely severe depression was more common among the mothers in comparison to fathers. In the same line, other researchers have reported that mothers of children with type 1 diabetes and cancer experienced depression more compared to fathers.<sup>4, 15, 27</sup> Uncertainty was yet another experience presented in mothers in comparison to the fathers,<sup>15</sup> which might have a negative impact on their mood.

The findings of the present study showed that the parents' depression was associated with satisfaction with their lives and health. This means that the parents of children with higher levels of depression were less satisfied with their life and health status. Although few studies have examined the association between these two variables, researchers believed that the parents' mental health was associated with adolescents' depression.<sup>30</sup>

The results of this study showed a larger number of child hospitalizations among the parents with high stress and low resilience levels. Satisfaction with life and health was also lower in the parents with high stress and low resilience levels. The results also revealed an association between the level of anxiety and life satisfaction. A previous study showed that parental stress was associated with change in the child's disease status, disturbance in family life, and parents' role in the treatment process.<sup>31</sup> In the same line, researchers believed that increased anxiety levels led to reduction of parents' life satisfaction.<sup>32</sup> One other study also indicated

that lower mean score of resiliency was associated with lower life satisfaction.<sup>28</sup> The results of a qualitative study on parents of children with diabetes indicated that crises and experiences were effective factors in the parents' coping ability. This means that family crises, such as child's development, might affect parents' adjustment with child's illness. Moreover, hard events and situations created conditions for the parents where their ability to cope with additional stress was not enough.<sup>33</sup> Therefore, child hospitalization as a stressful situation had a negative impact on resiliency. Consistent with the present study findings, another study on parents with cancer children revealed that resiliency was related to mental health, such as family coherence and good self-perception. Thus, resiliency might play a protective role for mental health in parents with such children.<sup>34</sup>

The present study findings indicated a significant association between resilience and depression, anxiety, and stress in parents with insulin-dependent children and adolescents. In other words, the parents who experienced normal or mild levels of depression, anxiety, and stress had high mean scores of resilience. Moreover, resilience was predicted by depression. Consistently, it was denoted that resilience was significantly associated with anxiety and depression symptoms.<sup>35</sup> The negative association was seen between resilience and depression in parents caring child with type 1 diabetes.<sup>21</sup> It has also been reported that higher resiliency led to lower levels of uncertainty during illness and depression.<sup>15</sup> For instance, parents of children with cancer who had lower resilience resources suffered from more distress and had lower family function.<sup>28</sup> Parents with cancer children were also at risk of poor psychosocial outcomes, which were more common in those with lower resilience.<sup>28</sup>

One of the limitations of this study was its cross-sectional nature. Therefore, a longitudinal study is recommended to be conducted on the issue. Another limitation was that the study was conducted in a diabetes



center in Shiraz. In order to generalize the results, further studies with larger sample sizes are suggested to be performed in different regions of the country and around the world. The last limitation was using convenience sampling (not random sampling).

As this was a correlational study, no intervention was used to decrease psychological issues in the parents; therefore, performing some interventions for these issues is suggested. The results of this study are valuable in clinical settings and nursing home care centers. The findings showed that half of the parents experienced depression, anxiety, and stress and that these variables were associated with resilience. Therefore, paying attention to the parents' psychological issues is of particular importance. Psychological issues, such as depression, anxiety, and stress, can be reduced by increasing resiliency through education.

### CONCLUSION

The results of this study showed that half of the parents of children and adolescents with insulin-dependent diabetes experienced mild to extremely severe stress and depression. In addition, nearly two-thirds of the parents had mild to extremely severe anxiety. Considering the association between resilience and depression, anxiety, and stress, interventions are recommended to be performed to improve the parents' resilience and, consequently, reduce their depression, anxiety, and stress.

### ACKNOWLEDGEMENT

This study was financially supported by Shiraz University of Medical Sciences, Shiraz, Iran (Grant No: 94-01-86-9770). Hereby, the authors would like to thank Ms. A. Keivanshekouh at the Research Improvement Centre of Shiraz University of Medical Sciences for improving the use of English in the manuscript. They would also like to appreciate the parents of children and adolescents for participating in this study.

**Conflict of Interest:** None declared.

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