

ORIGINAL ARTICLE

The Effect of Happiness Educational Program of Fordyce on the Sense of Coherence and Psychological Well-being of Adolescents with a Parent with Cancer: A Randomized Clinical Trial

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ABSTRACT

Background: Having a parent with cancer is one of the risk factors for adolescents, which makes them face many psychological problems. Therefore, this study aimed to determine the effect of Happiness Educational Program of Fordyce on the sense of coherence and psychological well-being of adolescents who have a parent with cancer.

Methods: In this randomized clinical trial study, 92 adolescents whose diagnosed parents have referred to the oncology ward of Shahid Rajaei Hospital in Yasuj, from June to September 2021, were selected through the convenience sampling method; however, they were randomly assigned to one of the two groups of the intervention or control. The number of sessions in the intervention group was 6, each consisting of 60 minutes and performed one day a week for 6 weeks. In addition to the demographic information form, the Antonovsky's Sense of Coherence Questionnaire-13 and the Ryff's scale of Psychological Well-being-18 were used before and immediately after the intervention. Data were analyzed through SPSS software, version 21, using statistical tests of Chi-square, t-test, Fisher's exact, Mann-Whitney, and Wilcoxon.

Results: After the intervention, statistically significant differences were observed in the median scores of the sense of coherence ($P<0.001$) and psychological well-being ($P<0.001$) between the two groups of intervention and control.

Conclusion: Although the Happiness Educational Program of Fordyce could improve the sense of coherence and psychological well-being of adolescents who have a parent with cancer, more investigations are recommended to be conducted.

Trial Registration Number: IRCT20210331050795N1.

Keywords: Happiness, Sense of coherence, Psychological well-being, Adolescent

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INTRODUCTION

Cancer is a major public health problem worldwide.¹ By the use of the Global Cancer Observatory, about 20 million new cancer cases and 9.7 million deaths were estimated in 2022. The estimated number of people who were alive within 5 years following a cancer diagnosis was 53.5 million. About 1 in 5 people develop cancer in their lifetime.² Cancer is the third cause of death in Iran. More than half of cancer deaths occur in developing countries. The annual incidence rate of cancer in Iran is 98 to 100 per 100,000 people.³

Parental cancer creates unique challenges for families.⁴ Adolescence can be considered a sensitive stage, during which the quality of physical, nutritional, and social environments may change the paths of health and growth to the next stages of life.⁵ Having a parent with cancer creates a psychological crisis for teenagers and young adults. These teenagers use mechanisms such as fear, anxiety, perceived stress, depression, sleep disorders, psychosomatic syndromes, hostility, and uncertainty to respond to their parents' cancer.⁶ Positive psychology interventions have shown their important effects in increasing passivity.⁷ Ryff considers psychological well-being as a person's effort to grow and progress, to flourish his potential abilities. It includes 6 dimensions: Autonomy, Personal Growth, Environmental Mastery, Purpose in Life, Self-Acceptance, and Positive Relations with Others.⁸

Psychological well-being encourages healthy behaviors and makes a person avoid unhealthy behaviors. Key indicators of psychological well-being, such as life satisfaction, purpose in life, and optimism, are associated with improved health outcomes.⁹ The sense of coherence is known as one of the important factors in the psychological adaptation of cancer patients. Antonovsky states that the sense of coherence is like a personality trait or a coping trait that is created in early childhood and is strengthened later in life, based on the degree of a person's sense of control over his environment and results.¹⁰

Thus, the sense of coherence is more similar to the situation of confrontation.¹¹ The sense of coherence is mainly tested and reinforced in childhood and early youth. The years before the age of 30 are the most important period when it comes to developing a sense of coherence. The process of developing a sense of coherence is known as the internalization of external resources that are at an individual's disposal and can ultimately reduce the current need for other resources.¹² Around the world, various cross-sectional studies have shown that a strong sense of coherence improves well-being.¹³

The happiness educational program improves the cognitive and emotional state of patients and allows them to adopt a more positive attitude towards life events and respond to challenges with optimism by adapting to changing conditions.¹⁴ People with deeper happiness have a greater sense of coherence. Therefore, you can use programs to increase happiness to promote resilience, happiness, and vitality. One of these programs is Fordyce Happiness Educational Program. This program includes fourteen cognitive and behavioral components.¹⁵ Fordyce's happiness principles include developing a healthy personality, removing the concerns, reducing the expectations and wishes, being the real self, and giving priority to happiness,¹⁶ which leads to certain changes in the cognitive and emotional state of people and helps them adopt a more positive attitude towards life events.¹⁷

The results of a study showed that Happiness Educational and Performance Program of Fordyce significantly reduced depression scores in hemodialysis patients.¹⁸ Also, Kushlev et al. found that happiness improved physical health and subjective well-being.¹⁹ The results of the other studies showed that the salutogenesis program for adolescents with moyamoya disease effectively improved the generalized resistance resources and sense of coherence in adolescents with moyamoya disease.²⁰ Also, Cheng et al. found that music breathing, a program based on mindful breathing and music listening therapy, helps

one to cope with stress by promoting a sense of coherence. Individuals will benefit from the long-term effect of this intervention to enhance their sense of coherence to cope with stressful events and promote better mental well-being.²¹

Most mental health problems are formed in adolescence and early adulthood. Adolescents have more cognitive abilities and understanding than school-age children, and they understand their parents' illness and the problems arising from it better. One of the aspects of an adolescent's life that can be affected by these conditions is psychological well-being, and paying more attention to it will provide him with a higher sense of coherence. Adolescents with a parent with cancer experience high levels of changes, including mood and self-confidence, crying, fear, tension, anxiety, worrying, sleep problems, drop in academic performance, individual and social changes.²² Since many happiness programs have been conducted for chronic patients and have had a positive effect,^{18, 23} considering the effects of parental illness on adolescents and the lack of studies in this field, this study was conducted to examine the effect of the Fordyce Happiness Educational Program on the sense of coherence and psychological well-being of adolescents who have a parent with cancer.

METHODS

The present study is a randomized clinical trial study in which 110 adolescents with parents suffering from cancer who referred to the oncology ward of Shahid Rajaei Hospital in Yasuj, from June to September 2021, was assessed for eligibility. Ninety-two eligible adolescents who met the inclusion criteria were randomly assigned to one of the two groups of the intervention (n=46) or the control (n=46). This was done using random allocation software; the adolescents were assigned by permuted block random allocation with 23 equal-sized blocks (4 subjects).

Sample size was calculated based on the

following statistical formula while considering the parameters: $\alpha=0.05$, $1-\alpha=0.95$, $z_{1-\alpha/2}=1.96$, $\beta=0.2$, $1-\beta=0.8$, $z_{1-\beta}=0.85$, and $d=0.6$ or effect size (mean difference in term of clinical important) based on proposed values of the effect size by Cohen for t-test for the mean difference between two independent groups.²² Finally, the sample size was estimated to be 43 participants for each group and a total of 92 participants ($n_1=46$, $n_2=46$) were finally considered with 5% drop out.

$$n = \frac{2 * [(z_{1-\alpha/2}) + (z_{1-\beta})]^2}{d^2}$$

Only the participants including the parents and their adolescent who signed their informed consent forms participated in this study. The scores of the Sense of Coherence ≤ 52 ²³ based on Antonovsky's questionnaire, scores of psychological well-being ≤ 91 ²⁴ based on the Ryff's scale, lack of past medical history of psychologic disorders such as anxiety or depression, one of the parents suffering from cancer, at least six months passed since the definite diagnosis of the parent's cancer by an oncologist, only one teenager from each family with a parent with cancer, and adolescents aged 13 to 18 years were also considered as the inclusion criteria. The lack of the adolescent or family members' knowledge about the parent's cancer, failure to attend more than two sessions of the intervention, and unwillingness to continue the intervention were the exclusion criteria (Figure 1).

In addition to demographic information such as adolescent age, adolescent sex, number of children in the family, age of affected parent, gender of affected parent, level of education of affected parent, occupation of affected parent, marital status of affected parent, time of parent's cancer diagnosis, cancer recurrence, stage of treatment, type of treatment and difficulty in parent's communication with the adolescent, the Antonovsky's Sense of Coherence Questionnaire (SOC) with 13 items and the Ryff's scale of Psychological well-being with 18 items were applied to collect the data.

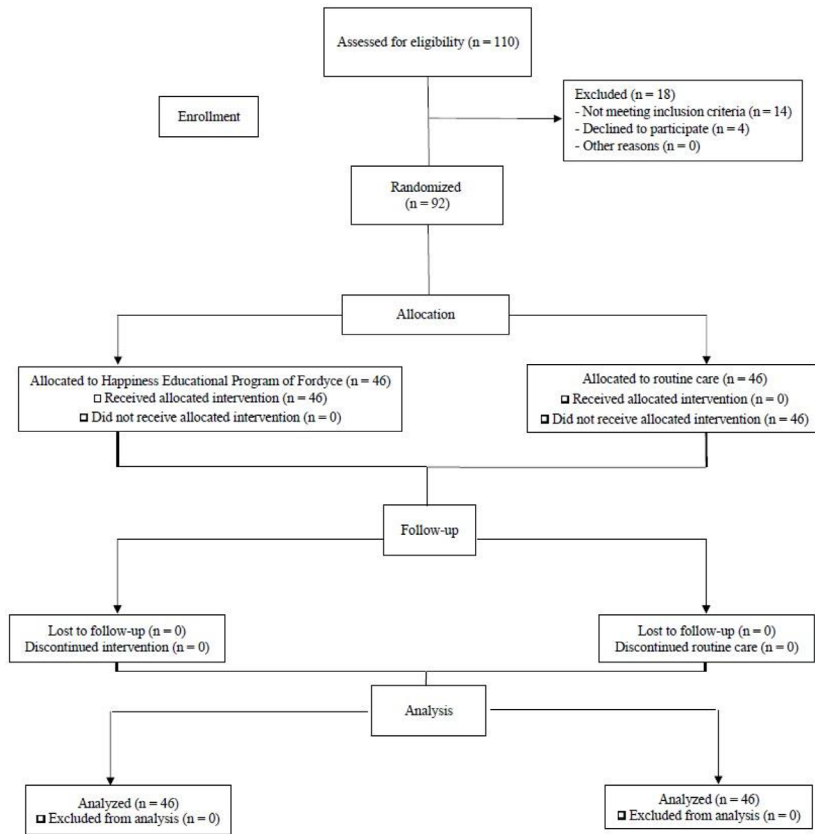


Figure 1: CONSORT flow chart of the study

The SOC-13 was prepared by Antonovsky; it contains three subscales: Comprehensibility, Manageability, and Meaningfulness. The items in this questionnaire are scored using a 7-point Likert scale, from 1 (unwillingness) to 7 (strong willingness). This scoring is reversed in some items. For the total score of the questionnaire, the total scores of all questions are added together. This score has a range from 13 to 91. The higher the score, the higher the sense of coherence of the respondent and vice versa. The cut-off points include: the scores between 13 and 26 indicate a low sense of coherence, scores of 27 to 52 indicate a medium sense of coherence, and scores above 52 show a high sense of coherence. The higher this score is above 52, the higher the individual's sense of coherence will be, and vice versa.²⁵ The α values ranged from 0.70 to 0.92 in 127 studies using the SOC-13 and from 0.35 to 0.91 in 60 studies using the modified SOC scale. Test-retest correlations show stability and range from 0.69 to 0.78 (1 year), 0.64 (3

years), 0.42 to 0.45 (4 years), 0.59 to 0.67 (5 years) to 0.54 (10 years).²⁶ The validity and reliability of this questionnaire in Iran have been examined by Mahammadzadeh et al. The results of concurrent validity showed a correlation of 0.54 between the scores obtained from the sense of coherence with hardiness scores at a significance level of 0.01. The results related to the construct validity also show that the first item of the sense of coherence questionnaire with a value of 3.55 determines the highest variance (27.34) of the tool, in comparison with other factors, which indicates the acceptable validity of the sense of coherence questionnaire. Also, the findings showed that this questionnaire was reliable with Cronbach's alpha coefficient of 0.77.²³ Cronbach's alpha coefficient of this questionnaire was re-examined and reported to be 0.75.

The Ryff's scale of psychological well-being-18 was developed by Ryff. The items are scored using a 6-point Likert scale, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

Therefore, the total score is in the range of 18–108, with higher scores representing greater well-being. This scale has 6 subscales: Autonomy, Personal Growth, Environmental Mastery, Purpose in Life, Self-Acceptance, and Positive Relations with Others.^{27, 28} In the National Survey of Families and Households (NSFH) II, the uncorrected correlations ranged from 0.65 to 0.98 although most (73.3%) were in the 0.65–0.81 range. The corrected latent correlations became substantially higher, ranging from 0.87 to 0.99. For Midlife in the United States (MIDUS) Series, the uncorrected latent correlations were notably lower, ranging from 0.48 to 0.87, with most (80%) being under 0.78, but corrected correlations became substantially higher, ranging from 0.76 to 0.96.²⁹ The validity and reliability of this questionnaire in Iran have been investigated by Khanjani et al. The correlation of the short version of this scale with the main scale has fluctuated from 0.70 to 0.89 percent. Its reliability has been confirmed using Cronbach’s alpha coefficient of 0.71.²⁴ Cronbach’s alpha coefficient of this scale was checked again by the researcher and reported to be 0.81.

After the approval of the research plan in the ethics committee of the university and obtaining the relevant letter of introduction, the researcher attended the oncology’s ward of Shahid Rajaei Hospital to select the research units in the morning and evening shifts; after interviewing the cancer patients and introducing himself, the researcher carefully examined them in terms of the inclusion criteria if they had a child in the age range of the research. Then, a written and informed consent form was completed by the parent and the adolescents. Adolescents were randomly

allocated to two intervention and control groups. The setting for education was also a room in Shahid Rajaei Hospital to observe the privacy of the adolescents. The number of sessions in the intervention group was 6, each consisting of 60 minutes and performed one day a week for 6 weeks. Interventions were performed in groups of 5 to 10 people. In the intervention group, Fordyce’s Happiness Educational Program³⁰ was implemented by the researcher with the help of a clinical psychologist using the methods of lectures, group discussions, questions and answers, and brainstorming. In short, they were covered in 6 sessions (Table 1).

In addition to the mentioned education sessions, the researcher provided the Fordyce Happiness Educational Program in the form of pamphlets to the intervention group at the end of each session. There was no intervention in the control group; however, the pamphlets about the Fordyce happiness were given them after completing the study. It should be noted that for prevention of data dissemination between the two groups, the intervention group was measured and evaluated on even days and the control group on odd days so that the participating members in both groups are not related to each other.

In addition to the baseline or pre-intervention, the sense of coherence and psychological well-being were assessed at the end of the intervention. Data were analyzed through IBM SPSS statistical samples version 21, using descriptive and inferential statistic. Chi-square test was used for nominal variables. Independent t-test was used for quantitative data. Normality of data was assessed by Kolmogorov-Smirnov test. The results of Mann-Whitney U test and Wilcoxon test

Table 1: Protocol of happiness educational program of Fordyce

Time	Content
1 st session	Introduction, definition of happiness, its necessity and importance
2 nd session	Learning to spend more time in social gatherings and do social activities
3 rd session	Principles of better planning and organization
4 th session	Teaching the principles of positive and optimistic thinking
5 th session	Teaching the principles of developing social and extroverted personality
6 th session	Teaching the principles of sincere communication as the most important source of happiness

were respectively reported for between-group and within-group comparisons of outcome variables due to lack of normal distribution. P-value less than 0.05 was considered as the statistical significance. Data collector and analyzer were blinded to the allocation of the participants in the two groups.

The current study was confirmed by the Research Ethics Committee (REC) of Yasuj University of Medical Sciences (YUMS) with the code of IR.YUMS.REC.1400.050. The purpose of the study was explained prior to the start of the sampling. Then, written informed consent was signed by both adolescents and their parents. The confidentiality of the collected data, voluntary participation in the study, and free withdrawal at each stage of the study without any effects on the treatment process were considered. The subject and his/her legal guardian were informed of all the information that could be effective in his/her decision, such as the title and objectives of the research, duration of the research, research method, etc. Parents were given the right to accompany their adolescents during the research. Information was given to the participants if they desired to know the results of the research. No cost was imposed on

patients, insurance institutions, and healthcare centers. The interventions were carried out in compliance with the protective guidelines of Covid-19.

RESULTS

Ninety-two adolescents (48.9% male versus 51.1% female with a mean age of 15.31±2.97 years) with parents with cancer (38% father versus 62% mother) completed the present study. No statistically significant differences were observed in their demographic characteristics (except education level of the affected parent) between the two groups (Table 2).

The state of the distribution of the outcome variable was assessed using the Kolmogorov-Smirnov statistical test. Because the distribution of the scores of the outcome variables did not have a normal distribution, the results of the non-parametric tests including Mann-Whitney U test and independents samples Median test were reported for mean rank and median scores of outcome variables, respectively.

Mann-Whitney U test showed no statistically significant differences for the mean rank of the sense of coherence before

Table 2: Participants characteristics by the groups

Variable	Group	Intervention	Control	P value
Age (year), Mean±SD	Adolescent	15.1±2.74	15.5±2.13	0.5*
	Affected parent	47.76±8.92	49.58±13.29	0.4*
Duration of diagnosis of disease (month), Mean±SD		24.19±20.8	27.3±26.16	0.3*
Adolescent gender, n (%)	Male	24 (52.2)	21 (45.7)	0.6**
	Female	22 (47.8)	25 (44.3)	
Gender of the Affected parent, n (%)	Father	17 (37)	18 (39.1)	1**
	Mother	29 (63)	28 (60.9)	
Occupation of Affected parent, n (%)	Unemployed	41 (89.1)	37 (80.4)	0.38**
	Employed	5 (10.9)	9 (19.6)	
Education of the Affected parent, n (%)	Under Diploma	14 (30.4)	27 (58.7)	0.002***
	Diploma	30 (65.3)	13 (28.3)	
	College degree	2 (4.3)	6 (13)	
Diagnosis, n (%)	Non metastatic	31 (67.4)	26 (56.5)	0.39**
	Metastatic	15 (32.6)	20 (43.5)	
Treatment, n (%)	Chemotherapy	29 (63)	22 (47.8)	0.2***
	Radiotherapy	4 (8.7)	2 (4.3)	
	Surgery	2 (4.3)	3 (6.5)	
	Combined treatment	11 (23.9)	19 (41.3)	

*Independent t-test; **Fisher Exact test;***Chi-square test

the intervention. Between-group comparison for median scores of the sense of coherence using independent samples median test also showed no significant differences between the two groups before the intervention ($P > 0.05$); however, a statistically significant difference was observed at the end of the intervention between the two groups ($P < 0.05$). In addition,

the result of the Wilcoxon test for within-group comparison indicated a statistically significant difference in the mean rank scores of the sense of coherence and its dimensions in the intervention group at the end of the intervention compared with pre-intervention ($P < 0.05$) (Table 3).

No statistically significant differences were

Table 3: Comparison of the sense of coherence and its subscales between and within the intervention and control groups

Variable		Intervention		Control		P value*
		Range	Median (IQR) ^a	Range	Median (IQR)	
Total sense of coherence	Before	40-50	45 (2.75)	41-48	45 (3)	0.841
	After	48-61	55.5 (3)	41-48	45 (3)	<0.001
	P value**	<0.001		1		
Comprehensibility	Before	10-14	12 (2)	10-14	12 (1.25)	0.4
	After	15-24	18 (2.25)	10-14	12 (1.25)	0.001
	P value**	<0.001		1		
Manageability	Before	14-18	16 (2)	14-19	16 (1)	0.5
	After	16-23	19 (2)	14-19	16 (1)	<0.001
	P value**	<0.001		1		
Meaningfulness	Before	15-18	16 (1)	14-18	16 (1)	0.9
	After	14-23	18 (2)	14-18	16 (1)	<0.001
	P value**	<0.001		1		

*Mann-Whitney U test; **Wilcoxon; ^a Inter-quartile range

Table 4: Comparison of psychological well-being and its subscales between and within intervention and control groups

Variable		Intervention		Control		P value*
		Range	Median (IQR) ^a	Range	Median (IQR)	
Total psychological well-being	Before	77-85	81 (3.25)	76-85	81 (2.25)	0.6
	After	74-105	95 (2)	76-85	81 (2.25)	<0.001
	P value**	<0.001		1		
Self-Acceptance	Before	13-16	15 (2)	13-16	15 (1)	0.5
	After	13-20	16 (3)	12-16	15 (1)	<0.001
	P value**	<0.001		1		
Environmental Mastery	Before	13-17	15 (1)	13-17	16 (1)	0.6
	After	11-20	17 (2)	13-17	16 (1)	0.04
	P value**	<0.001		1		
Personal Growth	Before	13-16	15 (1)	13-16	15 (2)	0.6
	After	8-19	16 (2.25)	13-16	15 (2)	0.005
	P value**	0.002		1		
Positive Relationship with others	Before	8-12	10 (2)	8-12	10 (1.25)	0.6
	After	10-19	16 (3)	8-12	10 (1.25)	<0.001
	P value**	<0.001		1		
Purpose in Life	Before	10-13	11 (2)	9-13	11 (2)	0.7
	After	10-19	15 (4)	9-13	11 (2)	<0.001
	P value**	<0.001		1		
Autonomy	Before	12-16	15 (1)	13-16	15 (1)	0.09
	After	10-20	15 (2.25)	13-16	15 (1)	<0.001
	P value**	0.04		1		

*Mann-Whitney U test; **Wilcoxon; ^aInter-quartile range

observed in the mean rank and median score of psychological well-being using Mann-Whitney U test and independent samples median test, respectively, between the two groups before the intervention ($P>0.05$); however, a statistically significant differences were observed at the end of the intervention between the two groups ($P<0.05$). Moreover, the result of Wilcoxon Signed Rank test for within-group comparison indicated a statistically significant difference in the mean rank scores of psychological well-being and its dimensions in the intervention group at the end of the intervention compared with pre-intervention ($P<0.05$) (Table 4).

DISCUSSION

This research was conducted to determine the effect of the Fordyce Happiness Educational Program on the sense of coherence and psychological well-being of adolescents who have a parent with cancer. The findings of this study showed that, immediately after the intervention, the Fordyce Happiness Educational Program increased the overall mean score of the sense of coherence of adolescents with a parent with cancer. In this regard, Ghaljaei et al. showed that Fordyce Happiness training program was effective and useful for the competence of mothers of premature infants admitted to the Neonatal Intensive Care Unit and to promote and maintain the mental health of mothers.³¹ Also, Barezzaei et al. showed that Fordyce Happiness Training could reduce the depression of mothers of Premature Infants Admitted to the Neonatal Intensive Care Unit.³² The results of these studies are consistent with those of the present study. The number of intervention sessions in these studies is close to the present study.

Since family relationships have a positive relationship with sense of coherence, there is a triangular relationship between family relationships, sense of coherence and happiness. Sense of coherence has played an important role in achieving happiness. Happiness is an important predictor of health and lifestyle. Happier people have a healthier

lifestyle. Therefore, it can be concluded that happiness plays an important role in promoting health.³³ Perhaps one of the reasons for the positive effect of the intervention can be the mentioned cases because by increasing happiness, many mental and psychological problems of adolescents are reduced and they can adapt to difficult and important conditions. According to the results of the present study, Fordyce Happiness Educational Program has improved the sense of coherence in adolescents with a parent with cancer and has reduced stress and psychological pressure on them. In this regard, Mikaeili et al. showed that training on the Fordyce Happiness Program is effective in reducing fatigue perception and increasing the sense of coherence of diabetic patients;³⁴ also, Da-Silva-Domingues et al. indicated that the sense of coherence was related to health behaviors both as a protective factor against high-risk behaviors and in its positive association with preventive and health-promoting behaviors of adolescents, young adults and university students.³⁵ These are consistent with the present study.

The results of the present study revealed that immediately after the completion of the intervention, the Fordyce Happiness Educational Program increased the overall mean psychological well-being score of adolescents with a parent with cancer. Sargolzaei et al, showed that happiness training improved thalassemia major patients' psychological well-being.³⁶ Also, Elham et al. showed that cognitive behavioral therapy focused on insomnia, mindfulness-based cognitive therapy, and Fordyce happiness training could be used in psychiatric centers to increase the affective capital of women with migraine.³⁷

Positive psychology focuses on the factors that help promote optimal well-being and examines the functional consequences of these states. Increasing positive emotions leads to social, occupational, and health benefits. Stronger social relationships reduce mortality and help people cope with stressful factors in life.³⁸ According to the stated content, however, as much as it is possible

to provide happiness to adolescents, the level of their psychological well-being will also increase, and this will improve their mental and psychological condition and their stress and worries. On the other hand, it causes adolescents to take better care of their parents in such conditions. Therefore, the present study showed that the Fordyce Happiness Educational Program, which is a part of positive psychology, promoted positive emotions and helped to improve the psychological well-being of adolescents with a parent with cancer, reducing the level of stress and anxiety in these people.

Consideration of mental health of adolescents who have a parent with cancer is the strength of this study. Cultural, social, economic, and religious factors, the possibility of making mistakes in the self-reporting due to the lack of concentration, and the possibility of non-cooperation and adherence to the implementation of practical plans of the participants due to the conditions and problems in the living environment are among the limitations of this study. Therefore, the generalization of the findings of this study should be done with caution. More studies with a large sample size and a longer period are needed to evaluate the clinical effectiveness of the Fordyce Happiness Educational Program.

CONCLUSION

Based on the findings of this research, it can be concluded that the implementation of the Fordyce Happiness Educational Program has a significant effect on promoting the sense of coherence and improving the psychological well-being of adolescents who have a parent with cancer. Therefore, it is suggested that the members of the health team should consider the implementation of this educational program for adolescents who have a parent with cancer and use this useful and beneficial educational program.

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