

## Original Article

# The Effects of Stress-coping Strategies and Life Skills Trainings on the Mental Health and Academic Progress of Adolescent Cancer Patients: A Quasi-experimental Study

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### ABSTRACT

**Background:** Cancer is a serious illness which can cause significant complications such as mental disorders. **Objective:** This study aimed to investigate the effects of stress-coping strategies (SCS) and life skills (LS) trainings on mental health and academic progress among adolescent cancer patients. **Methods:** This quasi-experimental study was conducted on 120 Iranian adolescent cancer patients. Participants were randomly allocated to a control ( $n = 60$ ) and an experimental group ( $n = 60$ ). A demographic questionnaire and the General Health Questionnaire were used to collect data on adolescents' mental health and grade point average (GPA) both before and after study intervention. A SCS and an LS training programs were held for the adolescents in the experimental group. However, adolescents in the control group received no training about the strategies and skills. The Chi-square, the Fisher's exact, as well as the independent- and the paired-sample  $t$ -tests were used for data analysis. **Results:** In the experimental group, the mean scores of the somatic symptoms, anxiety/insomnia, depression, and social dysfunction subscales of mental health were  $8.91 \pm 6.17$ ,  $10.33 \pm 5.43$ ,  $15.33 \pm 7.34$ , and  $16.23 \pm 3.61$  at baseline and significantly decreased to  $4.71 \pm 2.51$ ,  $6.61 \pm 2.62$ ,  $11.05 \pm 2.84$ , and  $12.31 \pm 5.45$ , respectively ( $P < 0.05$ ), while the mean GPA significantly increased after the study ( $P < 0.05$ ). However, in the control group, neither mental health nor GPA changed significantly ( $P > 0.05$ ). **Conclusion:** SCS and LS trainings can promote mental health and academic achievement among adolescent cancer patients.

**KEYWORDS:** Adolescent, Cancer, Life skills, Mental health, Stress

## INTRODUCTION

Cancer is a serious illness which can considerably decrease afflicted patients' social energy,<sup>[1]</sup> cause them psychosocial problems,<sup>[2]</sup> anxiety, and depression,<sup>[3]</sup> and increase mortality rate.<sup>[4]</sup> It can also negatively affect the academic life of patients, particularly adolescent patients who are in the critical stage of their lives. Therefore, developing and using strategies to promote adolescents' mental health and academic progress seem necessary.<sup>[5-7]</sup>

Nurses as the main caregivers have the responsibility to help their clients, specially cancer patients to adapt to perceived stressors, changes, or threats that interfere with meeting life demands and roles.<sup>[8]</sup> Many evidence-based

programs including life skills (LS) have been tested and deemed effective in reducing youths individual, interpersonal, and environmental problems and behaviors.<sup>[9]</sup>


LS training is a potentially effective strategy for promoting academic progress.<sup>[10]</sup> By definition, LS are a set of capabilities for adaptive and positive behavior which enable individuals to effectively manage demands, expectations, and problems of daily life and perform their social responsibilities without inflicting

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harm to themselves and others.<sup>[9]</sup> Another potentially effective strategy for academic progress and mental health promotion is stress-coping strategies (SCS). These strategies reduce stress and anxiety.<sup>[11]</sup>

A study by Shabani *et al.* indicated that LS training significantly improved anxiety symptoms and mental health among cancer patients.<sup>[12]</sup> However, Naseri *et al.* found that neither LS training nor SCS training significantly affected anxiety among university students.<sup>[13]</sup> These contradictory results highlight the importance of conducting further studies to produce convincing evidence about the effects of these strategies and skills.

### Objectives

This study aimed to investigate the effects of SCS and LS training on mental health and academic progress among adolescent cancer patients.

## METHODS

### Study design and participants

This quasi-experimental study was conducted from January to June 2015 on 120 adolescent cancer patients. Adolescents with different types of cancer who were supported by Mahak Charity were conveniently recruited to the study from “Happy cottages” of Mahak Charity, Tehran, and Kermanshah, Iran. “Happy cottages” are places in some pediatric hospitals in Iran where hospitalized children can attend and play or spend time with their parents. Adolescents were randomly allocated to a control ( $n = 60$ ) and an experimental group ( $n = 60$ ) using a table of random numbers. A list of adolescents was prepared, and then, the random numbers table was used. Those who received an odd number were assigned to the treatment group and those who received an even number were assigned to the control group. In the experimental group, the training sessions were held in a separate cottage room to minimize information leakage from the adolescents in the experimental group to their counterparts in the control group. No blinding was used in this study.

The sample size was calculated using the results of a pilot study on thirty patients. In the pilot study, patients’ baseline mental health was assessed using the General Health Questionnaire (GHQ), and then, they were provided with SCS and LS trainings. Three weeks afterward, their mental health was reassessed. The mean score of GHQ changed from  $12.29 \pm 3.29$  at baseline to  $10.24 \pm 2.31$  after the intervention. Sample size calculation formula [Figure 1] determined that fifty patients were needed for each group ( $\alpha = 0.05$ ,  $\beta = 0.05$ ,  $S_1 = 3.29$ ,  $S_2 = 2.31$ ,  $\mu_1 = 12.29$ ,  $\mu_2 = 10.24$ ,  $f[\alpha, \beta] = 13$ ).

Inclusion criteria were individuals aged 9–18 years, being students, a definite diagnosis of cancer at least

$$n = \frac{S_1^2 + S_2^2}{(\mu_2 - \mu_1)^2} \times f(\alpha, \beta)$$

Figure 1: Sample size calculation formula

6 months before the study, no history of participation in SCS or LS training programs, and no affliction by other chronic illnesses, learning disabilities, or mental retardation (diagnosed by a clinical psychologist). Any absence from the training sessions was considered as the exclusion criterion. At the time of the study, 173 adolescent cancer patients were hospitalized in the study setting; 47 of them did not meet the inclusion criteria or refused to participate. The remaining 126 adolescents were recruited. Six adolescents withdrew from the study, and thus, the study was done on 120 adolescents [Figure 2].

### Data collection instruments and intervention

A demographic questionnaire and the GHQ were used for data collection. GHQ has four seven-item subscales, namely somatic symptoms, anxiety/insomnia, social dysfunction, and depression. Items are responded on a four-point Likert scale from “very low” (scored 0) to “very high” (scored 3). The total scores of GHQ and its subscales are 0–84 and 0–21, respectively. Taghavi reported that GHQ has acceptable validity and reliability. He found that the Cronbach’s alpha of the questionnaire was 0.90.<sup>[14]</sup> Participants completed the study questionnaires either personally or through a short interview by the first author. Adolescents’ academic progress was also assessed through their grade point average (GPA). All measurements were made both at the beginning of the study (i.e., at the beginning of the second semester of 2015 in January) and at the end the study (i.e., at the end of the second semester in June).

Adolescents in the experimental group were provided with SCS and LS training in thirteen 45-minute daily sessions held at 10:00. LS training was provided in sessions 1–8, while SCS training was provided in sessions 9–13 [Table 1]. All sessions were held and managed by a clinical psychologist. Teaching methods used in this study included lecture, group discussion, video presentation, pamphlets, and leaflets. Adolescents in the control group received no SCS or LS training.

### Ethical considerations

This study was approved by the Ethics Committee of Kermanshah University of Medical Sciences, Kermanshah, Iran (approval code: KUMS. REC.1395.441). Moreover, it was registered in the Iranian Registry of Clinical Trials (registration number: IRCT2016050727779N1). The aim of the study was explained to the participants, and their parents and their written informed consents were gained. Participants were able to voluntarily withdraw

from the study. They were assured that their information would be kept confidential. The researchers were sensitive to preserve the participants' rights according to the Helsinki Ethical Declaration.

### Data analysis

The data were analyzed using the SPSS software (version 13.0; SPSS Inc., Chicago, IL, USA). Initially, the assumption of normality was tested for all variables via the Kolmogorov–Smirnov test. This test showed that all variables had a normal distribution. Accordingly, the Chi-square, as well as the independent- and the paired-sample *t*-tests were performed for between- and within-group comparisons.

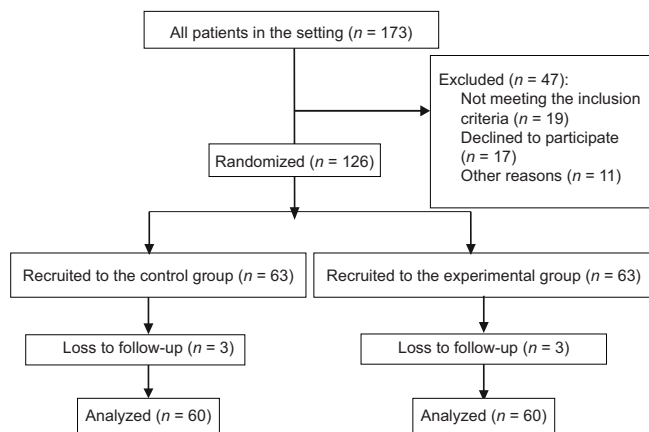


Figure 2: The flow diagram of the study

## RESULTS

On average, adolescents in the experimental and the control groups aged  $16.32 \pm 2.71$  and  $16.21 \pm 2.53$ , respectively ( $P > 0.05$ ). No significant difference was found between the groups regarding adolescents' demographic characteristics [Table 2].

At baseline, there were no significant differences between the groups regarding the mean scores of mental health and its subscales ( $P > 0.05$ ). In the experimental group, the mean scores of the somatic symptoms, anxiety/insomnia, depression, and social dysfunction subscales of mental health significantly decreased ( $P < 0.05$ ). However, in the control group, no significant changes were observed in the mean scores of mental health and its subscales ( $P > 0.05$ ). Between-group differences regarding the posttest mean scores of mental health and all its subscales were statistically significant [ $P < 0.05$ ; Table 3].

Study groups did not differ significantly regarding adolescents' mean GPA at baseline ( $P = 0.18$ ). However, after the intervention, GPA in the experimental group was significantly higher than the control group [ $P < 0.001$ ; Table 4].

## DISCUSSION

This study aimed to investigate the effects of SCS and LS training on mental health and academic progress among adolescent cancer patients. Findings indicated

Table 1: The outlines of the training sessions

Sessions	Skills/strategies	Skills/strategies in detail
1-3	Recognition (self-awareness)	Intellectual skills: Awareness of one's own positive and negative attributes; recognition of personal capabilities and abilities; familiarity with others' opinions about oneself
4-5	Decision-making	Intellectual skills: Understanding the concept of decision-making; familiarity with the process and the methods of decision-making Physical skills: Developing interest in the method of accurate decision-making; understanding the necessity of reflection before each decision-making
6-7	Empathy	Intellectual skills: Understanding the concept of empathy; understanding the difference between empathy and sympathy Physical skills: Ability to empathize with others; ability to modify daily conversations
8	Time management	How to concentrate, use different types of memory, and effectively use space and time
9-11	Stress coping	Understanding the concept of stress; familiarity with the complications of anxiety and stress; progressive muscle relaxation; the ability to stop negative thinking and anxiety
12-13	Attitude	Tendency to change unpleasant sensations; the possibility of getting relief from severe psychological stress; to get hopeful about future

that SCS and LS trainings were effective in alleviating anxiety. Shabani *et al.* and Kim *et al.* also reported the positive effects of LS training on stress<sup>[12]</sup> and the

positive effects of SCS training on anxiety among cancer patients.<sup>[15]</sup>

Findings also revealed that SCS and LS trainings significantly alleviated sleep problems such as insomnia. Similarly, Tuomilehto *et al.* reported that their lifestyle intervention could be an effective treatment for sleep apnea.<sup>[16]</sup> In a cancer patient, on the one hand, grappling with the chronic pain, and on the other hand, the anxiety of the unknown future can affect the sleep status. Therefore, LS training and SCS training are necessary to prevent insomnia in cancer patients.

Another finding of the study was the positive effects of SCS and LS trainings on depression among adolescent cancer patients. In line with this finding, two earlier studies found that lifestyle interventions significantly reduced depression.<sup>[17,18]</sup> After receiving a definitive diagnosis of cancer, patients may predict a grim future for themselves and consider cancer as the end of their lives. Accordingly, they may develop a wide range of mental disorders.<sup>[19,20]</sup> It seems that the reduction of depression level by SCS and LS training is related to the changes in the cognitive aspect of patient behavior; in this regard, the patients can learn how to relax their mind so that they will be able to cope with anxiety, stress, and depression.

The study findings also showed significant improvement in adolescents' social function after the SCS and LS training programs. Adolescents are often under great peer pressure and are extremely sensitive about their appearance and body image.<sup>[21]</sup> Consequently, any serious physical health problem, such as cancer, can significantly affect their appearance, peer relationships,

**Table 2: Between-group comparisons regarding participants' demographic characteristics**

Demographic characteristics	Groups <sup>a</sup>		P value
	Control	Experimental	
Gender			
Male	36 (60)	34 (56.67)	0.711
Female	24 (40)	26 (43.33)	
Family history of cancer			
Yes	19 (31.67)	21 (35)	0.699
No	41 (68.33)	39 (65)	
Financial problems for cancer treatment			
Slight	18 (30)	15 (25)	0.503
Moderate	33 (55)	39 (65)	
Serious	9 (15)	6 (10)	
Type of cancer			
Leukemia	22 (36.68)	20 (33.33)	0.989
Bone cancer	11 (18.33)	12 (20)	
Brain tumors	9 (15)	10 (16.67)	
Hodgkin's lymphoma	11 (18.33)	12 (20)	
Lung cancer	7 (11.66)	6 (10)	
Type of treatment			
Chemotherapy	35 (58.33)	37 (61.67)	0.929
Radiotherapy	16 (26.67)	15 (25)	
Surgery	9 (15)	8 (13.33)	
The highest parental education status			
Illiterate	10 (16.67)	8 (13.34)	0.827
Primary and secondary	36 (60)	39 (65)	
University	14 (23.33)	13 (21.66)	

<sup>a</sup>All data are presented as frequencies (%)

**Table 3: Within- and between-group comparisons regarding the mean scores of mental health and its subscales<sup>a</sup>**

Mental health and its subscales	Groups	Time		95% CI	P <sup>b</sup>
		Before	After		
Anxiety/insomnia	Experimental	10.33 ± 5.43	6.61 ± 2.62	2.253-5.215	<0.001
	Control	10.53 ± 4.69	10.33 ± 2.37	-0.528-0.928	0.584
	P <sup>c</sup>	0.831	<0.001		
Depression	Experimental	15.33 ± 7.34	11.05 ± 2.84	2.787-5.781	<0.001
	Control	15.53 ± 4.21	15.95 ± 2.33	-0.996-0.163	0.155
	P <sup>c</sup>	0.855	<0.001		
Somatic symptoms	Experimental	8.91 ± 6.17	4.71 ± 2.51	3.166-5.268	<0.001
	Control	8.95 ± 4.29	8.89 ± 5.01	-0.215-0.348	0.637
	P <sup>c</sup>	0.973	<0.001		
Social dysfunction	Experimental	16.23 ± 3.61	12.31 ± 5.45	3.097-4.771	<0.001
	Control	16.06 ± 3.71	16.14 ± 4.99	-0.462-0.329	0.737
	P <sup>c</sup>	0.803	<0.001		
Overall mental health	Experimental	50.81 ± 16.14	34.66 ± 10.92	13.781-18.553	<0.001
	Control	51.09 ± 11.59	51.31 ± 10.92	-1.085-0.652	0.619
	P <sup>c</sup>	0.917	<0.001		

<sup>a</sup>All data are presented as mean±SD, <sup>b</sup>The paired-sample *t*-test, <sup>c</sup>Independent-sample *t*-test. CI: Confidence interval of the difference, SD: Standard deviation

**Table 4: Within- and between-group comparisons regarding the students' mean grade point average<sup>a</sup>**

Group	Time		95% CI	P <sup>b</sup>
	Before	After		
Experimental	15.32 ± 2.15	16.77 ± 1.42	-1.785--1.087	<0.001
Control	15.64 ± 1.94	15.61 ± 1.95	-0.254-0.301	0.868
P <sup>c</sup>	0.419	<0.001		

<sup>a</sup>All data are presented as mean±SD, <sup>b</sup>Paired-sample *t*-test,

<sup>c</sup>Independent-sample *t*-test. CI: Confidence interval of the difference, SD: Standard deviation

and social function.<sup>[21,22]</sup> It seems that the changes (such as hair loss) that are caused by chemotherapy may disrupt adolescents' social function, but our study indicated that this problem can be decreased by SCS and LS trainings. Perhaps, the SCS and LS trainings can help the patients to recognize the personal capability and then facilitated their social presence and ability to communicate with others.

Another finding of the study was a significant improvement in somatic symptoms following the SCS and LS training programs. Psychological adaptation among adolescent cancer patients greatly affects their physical health complaints. Therefore, psychological reinforcements can improve their physical condition.<sup>[23,24]</sup> It seems that the SCS and LS training could help the patients to reduce their unpleasant sensations toward their symptoms, get relief from severe psychological stress, and get hopeful about future. Such changes then have led them toward a better psychological adaptation and decreased their complaints of somatic symptoms.

This study also indicated the positive effects of SCS and LS trainings on the academic progress of adolescent cancer patients. Similarly, Hatami and Kavousian found that LS training enhanced students' educational, emotional, and social adjustments.<sup>[25]</sup> Cancer can significantly affect academic life.<sup>[26,27]</sup> Yet, this study showed that SCS and LS trainings improve both mental health and academic progress among adolescent cancer patients. In our interpretation, improvement of the mental health may help the patients to have a school progress; however, the exact relationship between the mental health and academic progress should be investigated in further studies.

A limitation of this study was the lack of blinding that should be considered in the future study designs. Another limitation was the psychological condition of the participants while they presented in the training sessions. The cancer patients were really sensitive because of their chronic pain and some other stressors; therefore, sometimes, they were not able to endure the training sessions; in this regard, we had to consider

more break time and our trainer was an expert woman in clinical psychology who had experience in this field. Small sample size was another limitation of this study; therefore, further studies should have an increased number of participants. In the present study, our instrument measures insomnia and anxiety together; based on this limitation, a special instrument for assessing the sleep status should be considered in further researches.

## CONCLUSION

The findings of the present study suggest that SCS and LS trainings can be effective strategies for promoting academic progress and different aspects of mental health among adolescent cancer patients. Healthcare providers can use these strategies in the oncology wards to produce more positive patient outcomes.

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## Conflicts of interest

There are no conflicts of interest.

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