

Effectiveness of Problem Solving Skills Training on Psychological Hardiness and Cognitive Emotion Regulation Strategies in High School Students

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Abstract

Purpose: The aim of the present study was Examining the effectiveness of problem solving skills training on psychological Hardiness and cognitive emotion regulation strategies of high school students in Tehran.

Methodology: Method of research was an applied one in terms of purpose and a quasi-experimental in terms of data collection, with pretest-posttest, control group, random assignment of subjects. Statistical population included all female students studying in Tehran in 2017-18. Forty students were assigned through convenience sampling. That is 40 students were split into two groups, assigning 20 to each, one group as control and the other as experiment group. The experiment was trained problem solving (8 sessions, lasting 90 minutes each); the control group received no treatment (training). To collect data, the Psychological Hardiness Scale (Kobasa, 1979) and Cognitive Emotion Regulation Strategies (Garnefski et al, 2001) were used. Data analysis based on the data obtained from the questionnaires through SPSS-v22 was done at 0.05 significance level in two parts, descriptive and inferential (Covariance analysis).

Findings: Results showed that problem solving skills training affected adolescent's psychological hardiness and cognitive emotion regulation strategies ($p < 0.001$).

Conclusion: Therefore, Problem-solving skills training can be used as an effective intervention to improve psychological hardiness and cognitive emotion regulation strategies in high school students.

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1. Introduction

Students as the cornerstones have important roles and positions to accomplish the aims in educational system of the country. Therefore, considering them improves the moral and educational system more than before. In adolescence, when they have put childhood behind and they are in the eve of a new period in life, they face two moral paradoxical extremes. Sometimes they are aggressive, the other time they happen to show some high moral human values (George, et al., 2019). For this reason, the period is labeled as identity crisis (Gnilka and Broda, 2019). In adolescence period, the attention directs to the necessities of "Self", instead of focusing on action and behavior in the world outside. An adolescent equipped mentally enough, is ready to stable his personality; as a result, he will reach a balance in his personality in spite of conflicts, two-sided tendencies, identity confusion, losing prior balance and getting anxious (Villarosa-Hurlocker, et al., 2018). As the adolescents encounter various challenges, hurdles, and specific-period pressures (such as weak grades, levels of stress, threatening self-confidence as a result of poor performance, decrease of motivation and interest, behaving intolerably in difficult problems, ...in their academics everyday), students' psychological hardiness may be influenced by the conditions and problems adolescents and academics at high school. Hardiness is a collection of personality characteristics that acts as a resistance source against life pressures. A considerable sense of curiosity, a tendency to have interesting and meaningful experiences, believing in the effectiveness of whatever subjected to mental imaginations, expecting change as natural and any important motive may bring about growth and progress, self-disclosure and strength, the ability of perseverance, these characteristics all make one usefully adapt to difficult events of life. The logic behind these selections is some optimistically cognitive assessments that help individuals perceive their characteristics in spite of difficulties. Hence, people change intolerable events to tolerable ones (Ghazwani, Khalil, Ahmed, 2016). Some factors such as social malfunction in students or a fault in adaptive skills storage of learners via limiting their ability to respond to the requirements of academic life, a considerable decrease in positive emotional experience, and an increase in negative emotional experience, all of which may influence student's emotion regulation strategies and disorder them. In addition, cognitive emotion regulation strategies in students can be affected by the adolescence and academic conditions and problems at high school. Moreover, the individual's ability to adjust and manage things makes him realize emotions in himself and others. Behaving improperly toward emotions, usually named negative ones, such as sorrow, anger, and anxiety can have unpleasant effects on individuals' body and temperament (Mash, et al, 2011).

Regarding the points mentioned above, it is of high value to find treatment ways and lessen disorders caused by adolescence and academics. Problem solving training is a way of treatment in which the individual learns to apply his effective cognitive skills in coping with problematic interpersonal successes. Problem solving approach can be considered as a tool in facing many of their situational problems and solving them. Furthermore, it is believed in problem solving training strategy that problem solving training increases self-efficacy expectancy and individuals' personal sufficiency (Gellis and Bruce, 2018). Therefore, it is probable that it can affect the levels of social anxiety, psychological hardiness, and cognitive emotion regulation strategies and compassion to students themselves. Problem solving is often described with expressions such as autonomy, sufficiency, and self-confidence. There are 5 phases in problem solving training process to which many theorists agree as following: 1. general orientation 2. Defining and structuring the problem 3. presenting unique solutions 4. decision Making 5. research and survey. The research by Tavakoli Timaji and Poor Hamzeh (2016) which investigated the effectiveness of problem solving skills training on psychological hardiness in the couples with low matrimony satisfaction showed that problem solving training significantly decreased the couples' psychological hardiness. In addition, Aghaei, Mirzaei & Ahmadi (2016), Guarino (2018) investigated problem solving on psychological hardiness in elementary school students. Results showed problem solving training significantly affected their psychological hardiness.

Therefore, as said, the conditions and problems in adolescence and academic period at high school may affect the girls there in terms of psychological hardiness and cognitive emotion regulation strategies. Therefore, any factor that can affect the above variables and improve them, pave the way appropriately for their psychological condition. Problem solving training is looked at as a useful way to cope with many situational problems, leading to sustaining and promoting personality integration. The studies concerned with the effect of problem solving training on different psychological, social, cultural, and educational aspects and so on are increasing. The purpose of this research is to respond if problem-solving skill training significantly affects psychological hardiness and cognitive emotion regulation strategies.

2. Methodology

The method of research is an applied one in terms of aim, and quasi-experimental with pretest-posttest, control group, and random distribution of subjects in terms of data collection. The statistical population includes all female students studying in 2017-18 at high school in Tehran. In the research, 40 qualified subjects were decided to contain the sample via randomly convenience sampling (20 for problem solving training group and 20 for control group). After some coordination with school's responsibilities and attracting the parents' consent, some classes were selected through simple random sampling, and finally all the students in the selected classes completed the questionnaires. Then, those 40 students who gained the lowest grades were chosen and assigned randomly in experiment and control groups. At the next step, the students in the experiment group were invited to attend educational classes through invitation cards on which a summary of time, place and the goals of education classes were written. After being trained, posttest was given to all 3 groups. A summary of problem solving training sessions is shown in table 1.

The instruments administered in the present study include Psychological Hardiness Questionnaire (PHQ) (Kobasa, 1979) and the Cognitive Emotion Regulation Questionnaire (CERQ) (Garnefski et al., 2001). Psychological Hardiness Questionnaire was used based on surveying personal viewpoints (Hardiness) (Kobasa, 1979). The PHQ is a 50-item questionnaire, measured on a 4-point scale ranging from 1 (not right) to 4 (quite right), Consisting of the following three conceptually distinct subscales, namely Commitment, Control, and Challenge; each consisting of the following items respectively, 16, 17, and 17. In the study by Mady (2003), internal consistency was obtained for all the subscales as following: challenge (.71), control (.84), commitment (.75), and Hardiness totally (.88). The questionnaire was computed in terms of form and content, and revised where necessary. In the study by Kiamarsi & Abolghasemi (2006) Cronbach's reliabilities of the subscales ranged from .86, .82, .72, and .69, respectively for commitment, control, challenge, and all together.

Cognitive Emotional Regulation Questionnaire (CERQ): Garnefski et al (2001) which was to assess what participants tend to think after experiencing threatening or stressful life events developed the instrument. The CERQ consists of 36 items with 9 subscales including self-blame (items 1, 10, 19, 28), acceptance (2, 11, 20, 29), focus on thought/rumination (3, 12, 21, 30), positive refocusing (4, 13, 22, 31), refocus on planning (5, 14, 23, 32), positive reappraisal (5, 15, 33, 24), putting into perspective (7, 34, 25, 16), catastrophizing (8, 17, 35, 26), and blaming others (9, 26, 27, 18) which were measured on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). The questionnaire includes self-blame, acceptance, focus on thought/rumination, catastrophizing, and blaming others, as negative emotion regulation components, and positive refocusing, refocus on planning, positive reappraisal, putting into perspective, as the positive emotion regulation components. In the questionnaire, individuals are expected to reveal their reactions to threatening experiences or stressful threatening life events through answering to five questions, which evaluate the emotion regulation and control strategies. The questionnaire exists in two specific forms for adults and kids (Zare, 2017). The questionnaire developers (Garnefski et al., 2001) obtained the consistency via Cronbach Alpha for positive strategies (91), negative strategies (87), and total

questionnaire (93). Hassani (2011) validated the the questionnaire in which observed its validity based on internal consistency with Cronbach Alpha (.76 - .92), and retest with correlational domain (.51-.77).

Table1. Problem Solving Training (session 1

Sessions	Topics of content (outline)	Type of content, Conceptual–procedural Knowledge(theoretical-practical knowledge)	Goals	Teaching methods Lecture, question /answer Role playing Group discussion	Educational aids or audiovisual aids	Evaluation method (questionnaire or interview)
1	Realizing general situation	(theoretical-practical knowledge)	Problem-orientation	Giving lecture & theatrical classes	PowerPoint	Interview
2	Reinforcing first step, i.e. general situation	(theoretical-practical knowledge)	Describing the Problem	Question/ Answer	educational aids	Interview
3	Defining the problem precisely	Conceptual–procedural Knowledge	Framing the problem	Lecturing & group discussion	PowerPoint	Questionnaire
4	Providing a list of different solutions-brainstorm	(theoretical-practical knowledge)	Defining and realizing the problem, problem analysis and setting real aims	Group workshops	Audiovisual aids	Interview
5	Evaluating	Conceptual–procedural Knowledge	Presenting a new solution and the possibility of choosing the most efficient choice among answers	Question/ Answer and Group discussion	PowerPoint	Questionnaire
6	Decision making for executing the solution reached	(theoretical-practical knowledge)	Decision making and predicting probable consequences, realizing the utility of the consequences	Group discussion	PowerPoint	Interview
7	Proving	(theoretical-practical knowledge)	Executing the Solution, and the method reached	Question/ Answer And Role playing	Educational aids	Questionnaire
8	Reviewing prior steps, distributing questionnaires, and evaluating previous sessions	(theoretical-practical knowledge)	Observing the results followed and evaluation	Group discussion	Audiovisual aids	Interview

Data analysis was utilized through SPSS-v22 in two sections of descriptive and inferential (Covariance analysis) at significant level of .05.

3. Findings

In this section, the research variables are shown using measures of central tendency.

Table2. Descriptive statistics for psychological hardness and cognition emotion regulation strategies in adolescents

Group	Test	N	Mean	SD	Least	Most
Problem solving skills	Psychological hardness- pretest	20	109.4	34.94	4	138
	Psychological hardness- posttest	20	122.65	46.46	6	143
	Positive emotion regulation- pretest	20	36.75	18.45	25	96
	Positive emotion regulation- posttest	20	72.4	23.57	28	97
	Negative emotion regulation- pretest	20	63.7	13.7	20	69
	Negative emotion regulation- posttest	20	29.35	16.13	22	72
Control	Psychological hardness- pretest	20	112.95	32.31	4	137
	Psychological hardness- posttest	20	109.5	32.5	2	142
	Positive emotion regulation- pretest	20	37.05	17.2	28	95
	Positive emotion regulation- posttest	20	38.75	17.37	23	90
	Negative emotion regulation- pretest	20	65.15	15.31	21	70
	Negative emotion regulation- posttest	20	62.5	14.17	24	70

As you see the results in table 2, in experiment group with problem solving skills training, the mean is found of 109.4 for psychological hardness pretest (S.D. = 34.94), a mean of 122.65 for psychological hardness posttest (S.D. = 46.46), a mean of 36.75 for positive emotion regulation pretest (S.D. = 18.45), a mean of 72.4 for positive emotion regulation posttest (S.D. = 23.57), a mean of 63.7 for negative emotion regulation pretest (S.D. = 13.7), and a mean of 29.35 for negative emotion regulation posttest (S.D. = 16.13). Therefore, attending problem solving skills classes improves psychological hardness as well as positive and negative cognitive emotion regulation in two experiment groups, while no change was seen in psychological hardness and positive and negative cognitive emotion regulation in control group who did not participate in problem solving skills classes.

Table3. Results of multivariate analysis of covariance to study between-group difference of variables average

Changes source	Change source	Value	F	df	error	a
Main effects in groups	Pillai's Trace	.830	28.307	5	29	.001*
	Wilks' k	.170	28.307	5	29	.001*
	Hotteling's trace	4.880	28.307	5	29	.001*
	Roy's largest Root	4.880	28.307	5	29	.001*

Based on the results in table 3, in Pillai's Trace test ($f=28.307$), Wilks' k ($f=28.307$), Hotteling's trace (28.307), and Roy's largest Root (28.307) are significant at .05 level. The findings indicate that the subjects are different from each other at least in one of the variables. Studying the results in the table above shows that the treatment, i.e. pretest and posttest groups had significant effect on psychological hardness and positive and negative cognitive emotion regulation in adolescents.

Table 4 as the main table shows multivariate analysis of covariance (MANCOVA) between-groups difference in psychological hardness and positive and negative cognitive emotion regulation in adolescents.

Table4. Results of MANCOVA to study between-groups difference in variables

Changes source	Variable	SS	Df	F	a	Eta
Group	Psychological hardness	38518.807	1	43.667	.001*	.570
	Positive emotion regulation	10376.912	1	36.559	.001*	.526
	Negative emotion regulation	10300.865	1	68.409	.001*	.675
Error	Psychological hardness	29109.653	33			
	Positive emotion regulation	9366.850	33			
	Negative emotion regulation	4969.029	33			

* $P \leq .05$

The multivariate analysis showed a significant difference between the score means of experiment and control groups concerning psychological score in posttest ($F_{1, 33}=43.667$, $P=.001$). Therefore, attending problem solving skills training classes affects psychological hardness in adolescents (.57) showing as a cause to increase psychological hardness in posttest in comparison with pretest. Controlling pretest, a significant difference was observed between the mean of experiment and control groups due to positive emotion

regulation score in posttest ($F_{1, 33}=36.559$, $P=0.001$), So attending problem solving skills classes affects positive emotion regulation up to 52.6 percent. That is, the classes act as a cause to increase positive emotion regulation in posttest in comparison with pretest. Controlling pretest, a significant difference was observed between the mean of experiment and control groups due to negative emotion regulation score in posttest ($F_{1, 33}=68.409$, $P=0.001$), So attending problem solving skills classes affects negative emotion regulation up to 67.5 percent. That is, the classes act as a cause to decrease negative emotion regulation in posttest in comparison with pretest. Therefore, the hypothesis 2 is confirmed at the .95 confidence level, i.e. problem solving skills training affects significantly on psychological hardiness and cognitive emotion regulation strategies in adolescents.

4. Discussion

The focus of this paper was to study the effectiveness of problem solving skills training on psychological hardiness, and cognitive emotion regulation strategies in adolescents. Regarding this, the results of a study by Tavakoli Timaji and Poor Hamzeh (2016) showed that problem solving skills training had a significant effect on psychological hardiness of couples with a low quality matrimony satisfaction. Studying effectiveness of problem solving training on psychological hardiness of nursery and midwifery students showed that the mean for psychological hardiness scores in experiment group had a significant decrease comparing the control group (Ghavi Panjeh, Ebrahimi, Atri, 2014). In addition, Guarino (2018) showed that problem solving training had a significant effect on psychological hardiness in elementary students. To describe the finding, in the sessions the focus was to clarify this notion that when people face a typical problem, ordinary reactions associated with the prior solutions or conditional reflex are not able to help them to overcome the problems, but he has to execute past experiences and apply his knowledge while solving the problem. He has to recall the prior solutions and revise what he has learnt before. Moreover, he should put his information, skills, and habits together to clear their relationship with each other and the problem as well in order to draw out the suitable solution or solutions, consequently, take action to solve the problem. Therefore, we conclude that the training sessions for affecting problem solving on psychological hardiness were statistically significant.

Moreover, participating in classes training problem-solving skills affects positive emotion regulation in adolescents by increasing positive emotion regulation in posttest comparing with pretest. On the other hand, attending problem solving skills classes affects negative emotion regulation that is it decreases negative emotion regulation in posttest comparing with pretest. Aghaei, et al (2016) studied effectiveness of problem solving skills on cognitive emotion regulation strategies and self-esteem in the patients with MS showed that the mean scores in some cognitive emotion regulation strategies with self-esteem in experiment and control group are significant. The results showed that problem-solving skills are significantly affective on improving self-esteem and cognitive emotion regulation strategies. The study by Alikhani & Aghaei (2015) in effectiveness of problem solving training on cognitive emotion regulation strategies in high school female students in grade three in Isfahan showed no significant difference in posttest phase between experiment and control groups concerning cognitive emotion regulation strategies. While at follow-up one, a significant difference was shown between experiment and control groups concerning cognitive emotion regulation strategies totally and the subscales (self-blame, catastrophizing, and blaming others). To describe this, the emphasis in the sessions was the point that there is a difference between a person who faces a problem, decides to solve it but fails, with one who avoids the subject just for fear of execution problems, in spite of considering thinking about it as absurd. One of the most important causes why this way of challenging with the problem was wrong is that execution problems need an extra thinking and decision making, and when they were set to be challenged with, we understand they are not so much unsolvable as we used to think, just devoting some more time leads to solution, which increased emotion regulation in adolescents.

Regarding the fact that the high school students were the sample in the research, it is recommended to the coming researchers to study problem solving in different student grades and even students in university. Undoubtedly, the present findings can be used in comparative studies. Moreover, repeating this study on lower age groups and higher as well may lead to some valuable outcomes on effectiveness of this method on psychological hardiness and cognitive emotion regulation strategies. Therefore, it is firmly recommended that researchers apply the principles and the specific aspects of problem-solving skills training sessions in learning-teaching process and, finally studying the effects; in other words, it is better for them to study the effect of problem solving on class context. Clearly, it will be highly profitable to pave the way for these kinds of study to find the basic solutions in teaching methods. Consequently, investigating the effectiveness of the method(s) in other centers, and organization will result in efficient and interesting outcomes.

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