

The Effect of Self-Determination Activities on Communication and Interaction Skills and Academic Success (Grade Point Average) of Students at Risk of Emotional-Behavioral Disorders: A Randomized Controlled Trial

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Abstract

Background: Students with emotional and behavioral disorders (EBD) have lower academic efficiency than students with other disabilities and exhibit high levels of problematic behaviors and low levels of social functioning. This research aims to investigate the impact of self-determination activities on communication skills and scholastic achievement of students at risk of emotional-behavioral disorders.

Methods: The study was conducted through a randomized controlled trial during the academic year 2018-2019. The samples included 54 female students (14 to 16 years) at risk of emotional-behavioral disorders from secondary schools in Tehran, Iran. The sampling was conducted through a random cluster method. The applied tools encompass Youth Self-report and Assessment of Communication and Interaction Skills. Academic success was measured by students' grade point average (GPA) in two terms. The intervention was held in 8 sessions of 90 minutes, once a week, after the first term of academic of students for the intervention group and the control group did not receive any intervention during this period. The data were analyzed by SPSS-22, MANCOVA, T-test, and Chi-Square tests.

Results: The results of the multivariate analysis of covariance analysis showed self-determination has an impact on communication skills (physicality, information exchange and relations) of students at risk of emotional-behavioral disorders ($p < 0.05$). Comparing the difference between the averages of the two students' means, it was found that there was a significant difference in the two groups after the intervention ($p < 0.001$). Also, after the intervention, there was no significant difference between the two groups but the GPA of students in the intervention group increased from 13.19 to 15.61.

Conclusion: The findings suggested self-determination is effective for academic success and communication skills of students at risk of emotional-behavioral disorders and can be used in educational programs for these students.

Keywords: EBD, Emotional Disorders, Behavior Problems, Academic Success, Self-Determination, Communication, Social Interaction, Social Skills

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Introduction

The prevalence of mental disorders in children and adolescents in worldwide was 13.4% (1). The study indicated

that the prevalence of behavioral disorders was 19.8% in secondary students from a city in Iran (2). Students with

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↑What is “already known” in this topic:

The EBD students, in educational settings, exhibit low levels of social functioning and difficulty in their relationships and have lower academic efficiency than students with other disabilities.

→What this article adds:

Self-determination activities can be effective on the communication skills and GPA of the students at risk of emotional-behavioral disorders.

emotional-behavioral disorders have difficulty controlling their behavior, emotions, and relationships, exhibit high levels of misbehavior and have antisocial behavior patterns, difficulty in interpersonal relationships, limitations in participatory skills, and poor interaction with their peers (3-5). This disorder, with the occurrence of internalizing (depression and social anxiety), and externalizing (impulsivity and disobedience) behaviors, will cause significant challenges to teachers, parents, and peers in school. These challenges, containing the failure to provide approved behavioral patterns which are socially acceptable to peers and teachers, lead to short-term and long-term problems in students with emotional-behavioral disorders in their educational, psychosocial, and vocational areas (6).

The EBD students, in educational settings, exhibit high levels of problematic behaviors and low levels of social functioning. Students with emotional-behavioral disorders have lower academic efficiency than students with other disabilities (4). The rate of dropout in students with emotional-behavioral disorders is higher compared to peers without disabilities (50% vs. 44%), and they spend a lot of time jobless after leaving school (4, 7-9).

Of the most common problems addressed in students with or at risk of emotional-behavioral disorders is the shortage of communication and social skills and difficulty in their relationships (10). Although the definition of social skills is constantly developing, recent research has defined social skills as social competencies which allow individuals to solve problems when interacting with others, know social signals, and function well. Students who are recognized with emotional-behavioral disorders often do not have the social skills needed to negotiate their demands, meet social expectations, and develop relationships with peers and parents, in and out of the classroom (11). Research has suggested this group of negative behaviors of students with emotional-behavioral disorders leads to severe problems in the classroom environment; teachers address students' behavioral and communication problems to be the main obstacle to teaching and learning (7). In addition, past research has indicated students, who use appropriate social skills, may acquire necessary academic and social competencies for successful performance in school and society (7, 10).

Interventional studies have been conducted to reduce negative behaviors and increase students' social skills with or at risk for emotional-behavioral disorders. The interventions that have been applied so far are mindfulness and biofeedback (12), video modeling (13), and discontinuous attention (14). The findings of these studies suggest these interventions are effective in reducing externalization behaviors and increasing social skills. Interventions based on "Peer-Mediated Instruction (PMI)" are additionally a method as an evidence-based exercise to improve the educational outcomes of students with emotional-behavioral disorders addressed in the studies (8). Also, within the last 20 years, many studies have reviewed the effects of self-determination education among students with disabilities and self-determination has been realized and recognized as one of the most important factors in the successful transfer of students from education to independence (6,

15-19).

Feild et al. described self-determination as a set of skills, knowledge, and beliefs that empower a person to engage in self-regulatory, autonomous, and objective-directed behaviors. Perception of both one's strengths and weaknesses along with one's personal belief in ability and effectiveness are essential elements of self-determination. When individuals perform based on these skills and attitudes, they will be more capable of controlling their lives and accepting the role of successful adults in society (20). Field and Hoffman's self-determination model used in the present study consists of five sections self-awareness, planning, implementation, outcome experience and learning (21).

Due to the significance of the role of self-determination in adolescents with disabilities and/or emotional-behavioral disorders found in previous research and despite the problems adolescents with or at risk of emotional-behavioral disorders have in terms of communication skills and scholastic achievement, there is no available research to address both the impact of self-determination education on the communication skills of these students and to assess the scholastic achievement of adolescents at risk of emotional-behavioral disorders. Moreover, due to the existing problems in managing the behavior and communication skills of adolescents at risk of emotional-behavioral disorders, which will influence their relationships in the school environment, teachers, peers as well as students' scholastic achievement, it seems further research is needed to be conducted on interventions that can be effective in this context.

Thus, on the one hand, students' scholastic and communication problems are important, and on the other hand, self-determination has an impact on adolescents with disabilities. This research aimed to address the effect of self-determination on communication and interaction skills and scholastic achievement of students at risk of behavioral disorders.

Methods

Study design

This study was the secondary outcome of the RCT study with the objective of self-determination and effectiveness in students at risk of emotional behavioral disorders (22). The statistical population consisted of female adolescents studying in the first and second year of Tehran high schools who were at risk of EBD. the physical space in which intervention took place was in the classroom. The ethical approval was obtained from the local ethical committee (9321525001IR.IUMS.REC.1396).

The trial is registered with Clinical Trial Code (IRCT20171231038153N1).

Participants

The research sample consisted of 54 female students at risk of emotional-behavioral disorders in the semester of 2017-18 who were selected by random cluster sampling. A list of girls' high schools in the three districts was prepared and then four schools were selected for each district using random blocks. The inclusion criteria included age

14 to 16 years, female gender, obtaining a score of 60 to 70 in the Youth Self-Report (23), studying in normal high schools in Tehran province, and lack of taking psychiatric drugs. The exclusion criteria for samples consisted of lack of cooperation and willingness of the adolescent or parents to continue the intervention and two consecutive absences or 4 absences in all sessions.

Sample size

The sample size was determined based on the previous studies and the number of people eligible for inclusion criteria (24) and was based on the primary outcome as described in detail (22).

Tools

1) The Youth Self-report: The Achenbach System of Empirically Based form is used to assess adolescents with emotional-behavioral problems. The form was applied to screen and identify the youth at risk for emotional-behavioral disorders before conducting the intervention. It is a scale of 122 self-report questions for the youth aged 11 to 18, which can be responded to with a minimum education in the fifth grade of an elementary school for 15 minutes.

The scale consisted of two parts of competence that each part containing four areas of activities, scholastic performance, social efficiency, and general competence. The syndromes consisted of 112 items, and the subjects underlined the number which fits their own conditions according to a three-point scale (0, 1, and 2). These scales include 1- Isolation, 2- Physical complaints, 3- Depression / Anxiety, 4- Social problems, 5- Thinking problems, 6- Attention problems, 7- Delinquent behavior 8- Aggressive behavior. Also, the subscale of other behavioral problems encompasses a heterogeneous set of different problems and discomforts such as disobedience, not eating, and so on. by imposing cut-off scores, these empirical syndromes can be used to arrive at present versus absent categories of psychopathology, which is important in the medical assessment tradition.

The youth self-report is of appropriate reliability and validity in several studies. The internal consistency of the tools in 900 students in Tehran with the use of Cronbach's alpha method was 0.74 to 0.88. The reliability of its scales through retesting has been reported to be between 0.3 to 0.6 at a one-week interval and between 0.47 and 0.81 at a 7-month interval. The same coefficients with a time interval between three to four weeks were obtained at 0.87 on the general scale of problems and 0.69 on the scale of capabilities (23, 25).

2) The Assessment of Communication and Interaction Skills (ACIS): Kirsty Forsyth (1996), with reference to the model of human occupation, has reviewed and revised this test to measure communication and interaction skills and has gained the validity and reliability of this tool (23). This scale is an observational assessment method that measures the level of communication and interaction skills when individuals participate in a communication activity. In this research, the level of communication and interaction skills of students before and after the intervention was

measured with this tool.

The test contained 20 items of communication and interaction skills, which were classified into three main areas of "Physicality, information exchange, and relationships." Physicality consisted of 6 subscales as contact, looking, gestures, skillful movements, orientation and physical posture. Information exchange was of 9 subscales, including pronunciation, assertiveness, requesting, initiating interaction, expressing emotions, modulating voice, responding, speaking, and continuity of speech. The relations included 5 subscales which were cooperation, adaptation, focus, relationships and observance. The test ranking scale was a selection of one of the four "appropriate and adequate, questionable, ineffective and disruptive" options (26). The validity and reliability of the test in Iran were evaluated by Keivani et al. in 2001 and acceptable results were obtained (27).

Intervention Program

The intervention program was based on Field and Hoffman's model of self-determination (19). The model has five main parts of self-awareness, recognizing values, planning, implementing and gaining experience, and learning from the results. Before the intervention, a six-person panel of experts on youth mental health was formed to decide how to carry out the intervention program. The meeting agenda was divided into two parts of discussion and activities implementation in each session (Table 1). The program was held by the first author in 8 group sessions based on previous studies (28) for 90 minutes once a week for 2 months for all members of the intervention group in the school environment and in the classroom with appropriate physical conditions. The sessions were organized in 2 sessions of 45 minutes, with a 30-minute break time per day.

Procedures

Initially, after obtaining the code of ethics from the Ethics Committee of Iran University of Medical Sciences, the research conduct permit was obtained from the Directorate of Education of Tehran Province. This research was conducted in the 2017-18 academic year after the first round of school exams. With the coordination and permission of school principals and the consent of students and their parents, which was in the form of a written consent form, out of 500 students who filled out the youth self-report form, 54 students who were at risk for emotional-behavioral disorders were identified as a research sample and 27 students were randomly assigned to the intervention group and 27 to the control group. Participant flow is presented in Figure 1. Participants were randomized in a ratio of 1:1. Assessment of Communication and Interaction Skills (ACIS) was measured before and after the intervention sessions by a blinded person about the randomization of participants. After randomization and placing the participants in groups, 7 individuals were removed from the control group due to unwillingness to cooperate. The participants in the intervention group were randomly divided into 3 groups of 7 to 10 people. The intervention was conducted for all three groups by the researcher and

Table 1. Self-determination intervention program

Session	Title	Objectives	Content
1	Introduction to the concept of self-determination and reviewing its strengths and weaknesses	Self-awareness	Expressing strengths and weaknesses in physical, mental, emotional and social areas in the group and feedback provision to each other
2	Thinking about desires to create opportunities	Self-awareness	Drawing on desires and discussion about how they fulfill and review people's needs and priorities
3	Identifying matters of importance and life values	Recognizing values	Working with pottery mud to prepare a symbolic symbol of values
4	Creating opportunities to set long-term goals	Planning	Defining the goal and distinguishing long-term from short-term goals, setting long-term goals symbolically by selecting images in magazines and newspapers and pasting them on cardboard, and making collages
5	Setting short-term goals	Planning	Discussion and information exchange and planning for short-term goals and determination of the steps to achieve the long-term goals
6	Practicing daring skills	Implementation	Role-playing on problems in communication skills and then helping each other solve problems
7	Practicing and conducting self-determining behavior	Implementation	Cooking and painting symbolically likening group members to a variety of foods based on moral characteristics and giving feedback to each other
8	Experiencing the results and learning	Gaining experience and learning from the results	Arranging the environment, entertaining the guests (as an instance of a self-determined person), photographing and summarizing the results

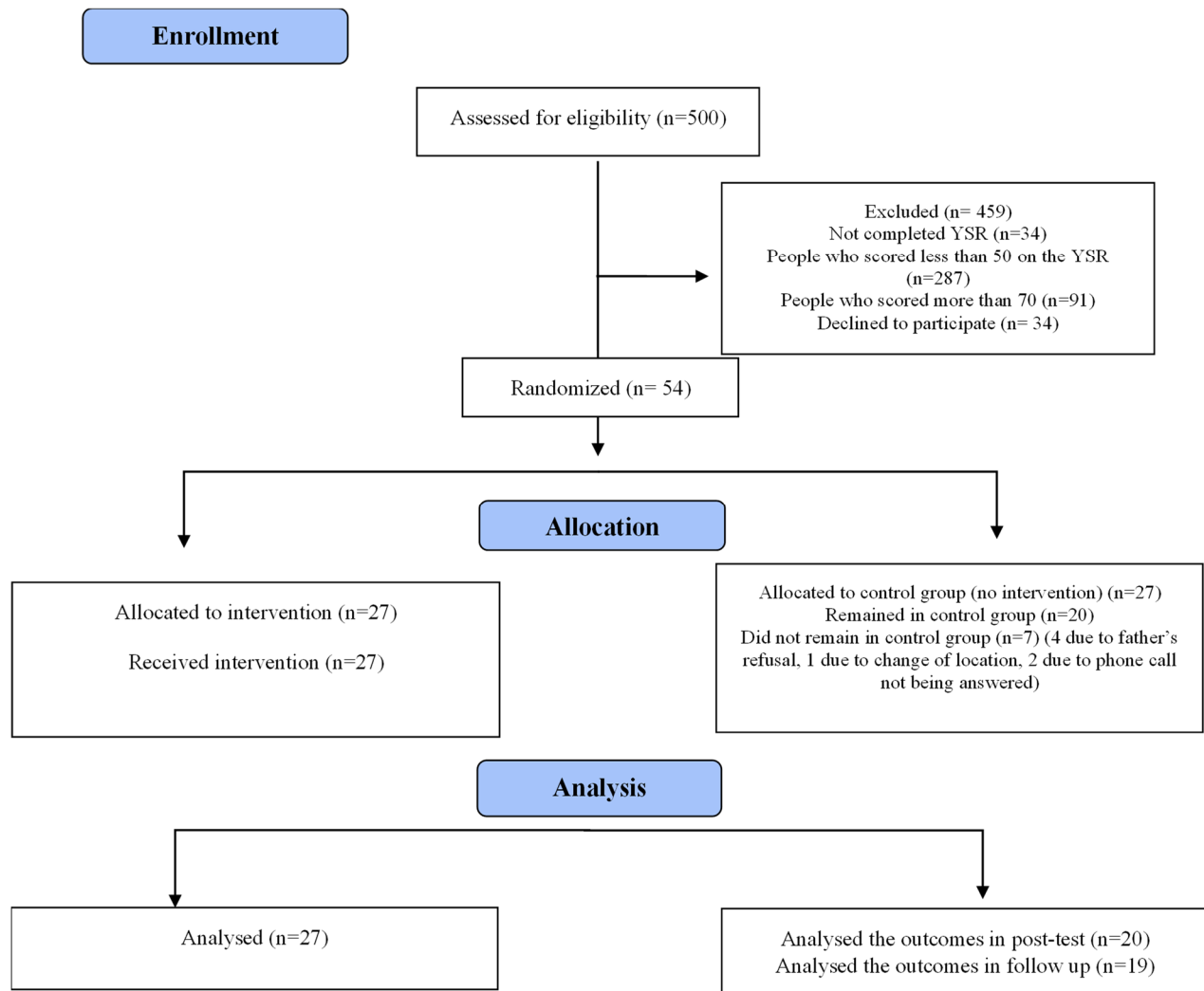


Fig. 1. CONSORT 2010 flow diagram of participants

the first author. The grade point average (GPA) of all participants in each term was received from school officials. The intervention was performed after receiving the first-semester grade point average and before obtaining the

second-semester grade point average.

Statistical analyses

At the end of the research conduct, the collected data

were analyzed by software SPSS version 22, and Chi-square and T-tests were applied for descriptive statistics. Multivariate Analysis of Covariance was applied to determine the significance of the differences between intervention and control groups in each of the dimensions of communication and interaction skills. The use of this analysis requires the observance of the assumptions which were reviewed before the test. Levene's test² was applied to investigate the homogeneity of error variance of the research variables in the two groups. To determine the overall effect of group variables on research variables, the Wilks Lambda test was used.

Results

The average age of the participants in the intervention group (15.26 ± 0.9) and the control group (15.00 ± 0.91) were homogeneous. In both groups, the number of samples in the tenth grade was higher in both groups. Both groups were equally distributed in terms of income, and there were more people with a family income of fewer than 2 million Tomans. In both groups, more samples lived with both parents; most mothers in both groups had a diploma, and most fathers had a high school degree. Additionally, the Chi-square test in qualitative variables and T-test in quantitative variables indicated the distribution of all studied variables was the same in the two groups and the groups were homogeneous ($p > 0.05$). Table 2 gives an overview of participant characteristics.

The mean of all three variables corresponding to the communication and interactive skills test in the post-test increased in the intervention group, but the control group variable of relations did not change and physicality and information exchange compared to the pre-test decreased (Table 3).

The results showed Levene's test is not significant for all dimensions at the level of 0.05 ($p > 0.05$). Thus, the condition of homogeneity of intergroup variances was observed, and no difference was seen between them. The results of Box's M2 test confirmed the homogeneity of the covariance matrix of the dependent variables at all levels of the independent variable (Box's $M = 35.408$, $p = 0.061$). Also, the absence of multivariate outlier data was investigated using Mahalanobis distance but outlier data was not identified and the accuracy of this hypothesis was reviewed. Hence, according to the relevant multivariate statistics, i.e., Wilks Lambda which was not significant at a 95% confidence level, the assumption of homogeneity of regression coefficients was established. Due to the assumptions of multivariate analysis of covariance, we were allowed to use this statistical test.

Given the results provided in Table 3, it can be seen the overall effect of the group is significant because F is related to all four tests with (13.577), and a freedom degree (3) is significant at the level ($p < 0.001$). That is, there is a significant difference between the two groups of intervention and control in at least one dimension of communication and interactive skills.

The mean and standard deviation of pre-test and post-test scores of each of the dimensions of communication and interaction skills and the results of multivariate analysis of covariance are provided in Table 4 to determine in which variables this general effect exists. Information on multivariate analysis of covariance is shown in Table 4, which compares the mean of the participants in the intervention and control groups in terms of dimensions of communication and interaction skills (physicality, information exchange and relations).

According to the contents of Table 4, it is concluded the

Table 2. Frequency distribution of demographic variables

Variable		Intervention Group (27 samples)		Control Group (20 samples)		P- value
		Frequency	Percentage	Frequency	Percentage	
Age	14-15	19	70.37	17	85	0.373
	15-16	8	29.62	3	15	
School grade	10th	20	74.07	18	90	0.266
	11th	7	25.92	2	10	
Family income level	Less than 2 million Tomans	16	59.26	16	80	0.373
	Between 2 to 6 million Tomans	10	37.04	3	15	
	More than 6 million Tomans	1	3.70	1	5	
Family status	Living with parents	24	88.88	15	75	0.303
	Living with father	0	0	1	5	
	Living with mother	3	11.11	4	20	
Mother's educational status	Illiterate	5	18.52	4	20	0.127
	High school	5	18.52	6	30	
	Diploma	14	51.85	9	45	
	Bachelor	3	11.11	1	5	
Father's educational status	Illiterate	5	18.52	2	10	0.714
	High school	12	44.44	9	45	
	Diploma	9	9	9	45	
	Bachelor	1	45	0	0	

Table 3. Significance test of multivariate analysis of covariance

Test	Value	F	df	Df _E	P-value
Pillai's trace	0.505	13.577	3	40	<0.001
Wilks Lambda	0.495	13.577	3	40	<0.001
Hotelling's trace	1.018	13.577	3	40	<0.001
Roy's Largest Root	1.018	13.577	3	40	<0.001

Table 4. Results of descriptive statistics and multivariate analysis of covariance to determine the intergroup difference in the studied variables

Variables	Group	mean \pm SD ¹	SS ¹	df ¹	F	P- value
Physicality	Pre-test Intervention	21.44 \pm 1.36	16.481	1	22.290	<0.001
	Control	21.15 \pm 1.69				
	Post-test Intervention	22.11 \pm 1.31	82.763	1	13.012	0.001
	Control	20.65 \pm 1.81				
Information exchange	Pre-test Intervention	32.41 \pm 3.46	12.142	1	8.793	0.005
	Control	32.30 \pm 2.47				
	Post-test Intervention	33.67 \pm 1.73				
	Control	30.75 \pm 4.12				
Relations	Pre-test Intervention	18.11 \pm 1.01				
	Control	18.00 \pm 1.17				
	Post-test Intervention	19.15 \pm 1.07				
	Control	18.00 \pm 1.07				

Table 5. Comparison of students' GPA and scholastic achievement in the first and second grades

Variable	Average	Standard deviation	T-test			
			Homoscedastic	T value	Degree of Freedom	P- value
GPA of the first term	Intervention	13.19	No	2.97	41.83	0.005
	Control	15.13				
GPA of the second term	Intervention	15.61	Yes	0.40	45	0.055
	Control	15.41				
The difference between the GPA of the two terms	Intervention	2.41	No	3.94	32.47	<0.001
	Control	0.28				

intervention group has higher scores than the control group in terms of physicality and information exchange.

Table 5 shows in the first term, there is a significant difference between the two groups in terms of students' grade point average (GPA), but after the intervention, the GPA of students in the intervention group increased from 13.19 to 15.61, but there is no significant difference in the two groups.

Given the difference between the GPA in the two terms, after the intervention, the difference between the GPA of the two grades in the intervention group was higher than that of the control group, and finally, the difference became significant.

Discussion

This research aimed to review the effect of self-determination on communication and interaction skills and scholastic achievement of students at risk of emotional-behavioral disorders. The results indicate the effect of self-determination skills training on increasing communication and interaction skills as well as academic achievement of students at risk of emotional-behavioral disorders.

In terms of the findings of the first hypothesis, the effect of self-determination training on students' communication and interaction skills was consistent with the results of the study conducted by Kelly et al. (2014) and Mansournejad et al. (2019). They have reported self-determination training leads to the improvement of externalizing behaviors and on-task behaviors in students with emotional-behavioral disorders (6, 19). Also, the findings of the present study show that teaching self-determination to students at risk for emotional-behavioral disorders can improve their communication and interaction skills, including physicality, information exchange and relations skills.

The result can be elaborated based on the theories expressed by Field et al. (2012). They reported that positive relationship is one of the key areas of education which should be taught to students to help them become more

self-determined. Also, according to Deci and Ryan's theory of self-determination, which considers relatedness as one of the three psychological needs of human beings (along with autonomy and competence) that if put together leads to a great sense of self-determination, this result is achieved that there is a direct relationship (21) between the two components of self-determination and communication and interactive skills.

Since the self-determination model of Field and Hoffman (2004) applied in the intervention increases people's self-awareness about their strengths and weaknesses in social skills, it seems by teaching self-determination and practicing in the intervention sessions and receiving feedback from others, the knowledge of students' social skills increased. The characteristics of communication and interaction skills include the ability to convey goals, needs and coordinate social actions to "cooperate with others," which consist of physical communication with others, speaking, participating, collaborating with others and expressing oneself (29). In self-determination training interventions conducted in the present study, emphasis was placed on communication and social skills such as assertiveness skill practice, type of conversation, expression of needs and communication with family and peers in the form of role-playing, practice and training.

Social skills training enables students to acquire the academic and social skills necessary for successful performance in school and the community (10). As a result, the second hypothesis was the investigation of self-determination education on the academic achievement of students with emotional-behavioral disorders, assuming the impact of the intervention on communication and interactive skills and analyzing the extent to which they may have scholastic achievement.

The statistical results obtained from the data collected from the students' GPA suggest that there is a significant difference between the two groups in relation to the students' GPA in the first term, and the GPA of the control

group is higher than the intervention group, but after the conducted intervention since the GPA of the students of the intervention group increased from 13.19 to 15.61 and the GPA of the control group changed from 15.13 to 15.41, it is found that there is more change in the GPA of the intervention group than the control group but the difference between the two groups was not significant. Thus, it can be concluded that the students participating in the intervention group were weaker in terms of academic status than the control group, but by participating in the intervention sessions, they could have more scholastic achievement than the control group.

The findings were consistent with the results of previous research which showed that self-determination skills education can lead to increased scholastic performance and achievement of educational goals in youth with disabilities (15-18). In general, it seems self-determination education is effective on the scholastic achievement of the youth at risk of emotional-behavioral disorders like those with disabilities.

According to the findings of Sang Ju et al., who concluded that self-defense, self-awareness, problem-solving, and goal setting and achieving are important characteristics for achieving self-determination. This improves self-determination skills, and leads to the academic and scholastic achievement of students with disabilities (30). The findings of this research can be explained by the fact that the youth experienced that despite various problems in the family, environment and living conditions, but relying on four main behaviors and outputs such as hard work, balancing expectations with their abilities, using some creative and self-directed methods in doing homework, compensating for some weaknesses and shortcomings, and ultimately being helped by support forces, not to increase dependency but as support along the way, can help them achieve success and scholastic progress.

Erickson et al. (2015) indicated that scholastic success depends on skills such as planning, organizing and ultimately gaining profit (14). The results of this study are consistent with Ericson's study results. So it can be explained that increasing the individual's awareness of the strengths and weaknesses in their social skills gained through self-determination training play a vital role in determining success in learning and academic achievement of students at risk of emotional-behavioral disorders.

Of the limitations of the research was the reviewed sample of female students aged 14 to 16 years, and it was not possible for the researchers to intervene in boys' schools. Therefore, it is limited to generalizing the results to other students of different ages and genders. It is suggested that future studies measure the effectiveness of this study in young boys at risk for emotional-behavioral disorders and compare the results with each other. In addition, due to the unavailability of all research samples, it was not possible to follow up on the study results after six months to one year; hence, it is suggested future studies to follow up on the impact of the present study interventions on communication skills of adolescents at risk for emotional-behavioral disorders after six months to one year.

Conclusion

Students at risk of emotional and behavioral disorders have difficulty in the social and academic skills. The self-determination activities and programs lead to increase self-awareness, which result in an improvement of communication and interaction skills. Furthermore, these programs may lead to better results in the academic skills of the EBD students.

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Conflict of Interests

The authors declare that they have no competing interests.

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