




Effect of occupational therapy on self-determination skills of adolescents at risk of emotional and behavioral disorders: A randomized controlled trial

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Abstract

Background: Self-determination skills enable to support an individual's needs and make decisions to function independently. Improvement of self-determination skills has had a positive result for adolescents at risk of Emotional and Behavioral Disorders (EBD). The aim of this study was to investigate the effect of occupational therapy interventions on the self-determination skills of adolescent girls at risk of emotional-behavioral disorders.

Methods: In this single-blind control trial study, 14-16-years-old girl students (n=54) at risk of EBD were recruited by cluster sampling from secondary high schools of Tehran, Iran. Youth self-report Questionnaire (YSR) was used to include adolescents at risk of EBD in the study and were randomized into the intervention (n=27) and control group (n=27) by block randomization. The Student Self-Determination Scale (SDSS) and the Self-determination Parent Perception Scale (SDPPS) were used to collect data. Students in the intervention group participated in 8 – once a week- sessions of occupational therapy and the control group received no training. Data were analyzed by repeated-measures analysis of variance (RMANOVA), Bonferroni test and SPSS 16.0 version. The significance level was set at 0.05.

Results: The score of self-determinations (SDSS) increased significantly in the intervention group after the intervention ($p < 0.001$). Although the mean scores of self-determination at follow-up have increased in the intervention group compared to the post-test. No significant differences were found ($p > 0.05$); also, the score of parents' perception of student self-determination (SDPPS) increased but there were not significantly different ($p = 0.064$).

Conclusion: The findings indicated self-determination skills could be taught to adolescents at risk of EBD in OT sessions. Since self-determination has been identified as the necessary skills for adolescents at-risk to transition into adulthood, occupational therapists have an important role in promoting self-determination skills in adolescents at risk of EBD.

Keywords: Occupational Therapy Interventions, Self-Determination, Emotional And Behavioral Disorders, Adolescents

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Introduction

Adolescence is a transitional stage in life with special

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↑What is “already known” in this topic:

Self-determination knowledge and skills are important life skills for success throughout the transition from adolescence to adulthood. Students with emotional behavioral disorders (EBD) are at a low level of self-determination, so they need to gain training in this domain. As a result of, occupational therapists play a main role in transition services for adolescents by preparing occupation-based evaluation and intervention, but there is a gap in researches that occupational therapy can be an appropriate intervention to promote self-determination.

→What this article adds:

This study showed that the self-determination skills of EBD adolescents promote after occupational therapy sessions. Therefore, occupational therapy services can be used along with other educational services to strengthen the self-determination skills in high school settings for adolescents at risk of EBD.

characteristics. Some of these characteristics play an important role in the health of adolescents into adulthood (1). During the adolescent period, a variety of emotional, physical, and social challenges are experienced which can have negative effects on behavioral adaptation (2). Studies indicated that approximately 20% of school-age population have emotional and behavioral disorders (EBD). Despite the prevalence of this disorder in the students, less than 1% of all students with EBD are supported (3). These students have higher absenteeism rates and lower academic achievement relative to comparison peers with other disabilities (4). They have problems with self-regulation and self-control and they also show deficits in areas vital for self-determination such as setting goals, delaying gratification, and having a precise self-appraisal (5, 6).

Self-determination defined as “voluntary actions that enables one to act as a key factor to gain control of and self-direct their lives and to maintain or enhance the quality of life” (4), self-determination in disabled high school adolescents leads to positive results in education, work, leisure, independent living style, and quality of life (7-10). Thus, training programs in self-determination skills for youth with disabilities are important (11). Also, learning self-determination skills can help students with EBD make positive decisions as adults (12, 13). The model of self-determination developed by Field and Hoffman (1994) (14) emphasizes core concepts such as personal values, self-knowledge, and engagement in meaningful occupations. The model contains five components that address knowing and valuing oneself, making and meeting goals, communicating and dealing with conflict, and finally, learning from outcomes.

Occupational therapy interventions establish a client-centered approach to facilitate engagement in meaningful occupations (15). These interventions help at-risk adolescents to develop self-understanding through reality-based treatment (16). Occupational therapists have the main role in transition services by preparing occupation-based evaluation and intervention (17). The primary focus of occupational therapists is occupations and activities related to school, relationships with friends and family, work, and socializing and creative activities (16). Creative activities provide meaning value and broad opportunities for choice and self-determination (18). Participating in activity can develop new skills in clients and promote learning through doing, which is one of the skills of occupational therapists (19). Despite these potentials in occupational therapy, there is a gap in self-determination-based transition planning programs to assist adolescents with or at risk of EBD.

However, some studies suggest that occupational therapy can be an appropriate intervention to promote self-determination (20-23), but there is limited evidence to examine the occupational therapy interventions in support of self-determination of the adolescent with or at risk of EBD. Therefore, the primary aim of this study was to determine the impact of occupational therapy interventions on the self-determination of adolescent girls at risk of EBD. The secondary aim of the research was to study the effects of OT interventions on parent's perception of the self-determination of their children.

Methods

Study Design

This single-blind (assessor) randomized controlled trial was designed in accordance with the CONSORT statement. Using block randomization, participants were assigned to the intervention and control groups. The ethical approval was obtained from the local ethical committee (9321525001IR.IUMS.REC.1396). The trial is registered with Clinical Trial Code (IRCT20171231038153N1). All participants provided informed consent and were free to withdraw at any stage. The setting for this study were classes of four public high schools.

Participants

Participants represent 54 high school age female students at risk of EBD selected by random cluster sampling from schools of North, South and Center of Tehran, Iran. The ages of the baseline participants 14 to 16 years old (mean age=15.26; SD=0.9). The participants studied in tenth (n=38; 80.85%) and eleventh grade (n=9; 19.15%) public high schools. The inclusion/ exclusion criteria were (a) age 14 to 16, (b) scores 60 to 70 from the YSR (24), (c) written informed consent from the adolescents and their parents.

Sample size and Randomization

We calculated the sample size requirements per group based on a previous study and using the following formula $n = \frac{2}{d^2} \times C_{p.Power}$, given a power of 80%, a confidence interval of 95%, and 0.87 mean differences. A sample size of 40 participants with 20 participants per group was required (25, 26). However, considering the attrition rate, 54 adolescents were randomly sampled for the intervention (n=27) and control (n=27) groups. Participants were randomized 1:1 into the intervention and control groups using the block randomization method (block size of 6). An independent person, who has not responsible elsewhere in the study, randomized codes by randomization block. Concealment of allocation was performed using sequentially numbered, sealed opaque envelopes. Figure 1 shows the recruitment and flow of participants throughout the trial.

Procedure

The study occurred during the academic year 2018-2019. At first, four girl high schools were randomly selected. The YSR conducted on 500 students, and 54 students at risk of EBD were included. Seven participants, after randomization, were deleted from the control group. They were reluctant to continue the research. All participants were assessed in pre- and post-intervention by a blinded assessor (master's degree in occupational therapy). The intervention program was implemented group-based. After completing the pre-test (SDSS and SDPPS), according to Yalom and Leszcz's suggestion about the number of people in group therapy (27), the participants in the intervention group were divided into three groups (two groups of 10 and 1 group of 7 persons). The students in intervention groups received eight 90-min sessions of occupational therapy and a self-determination plan. At the start of the intervention, the participants received instructions about the intervention from the

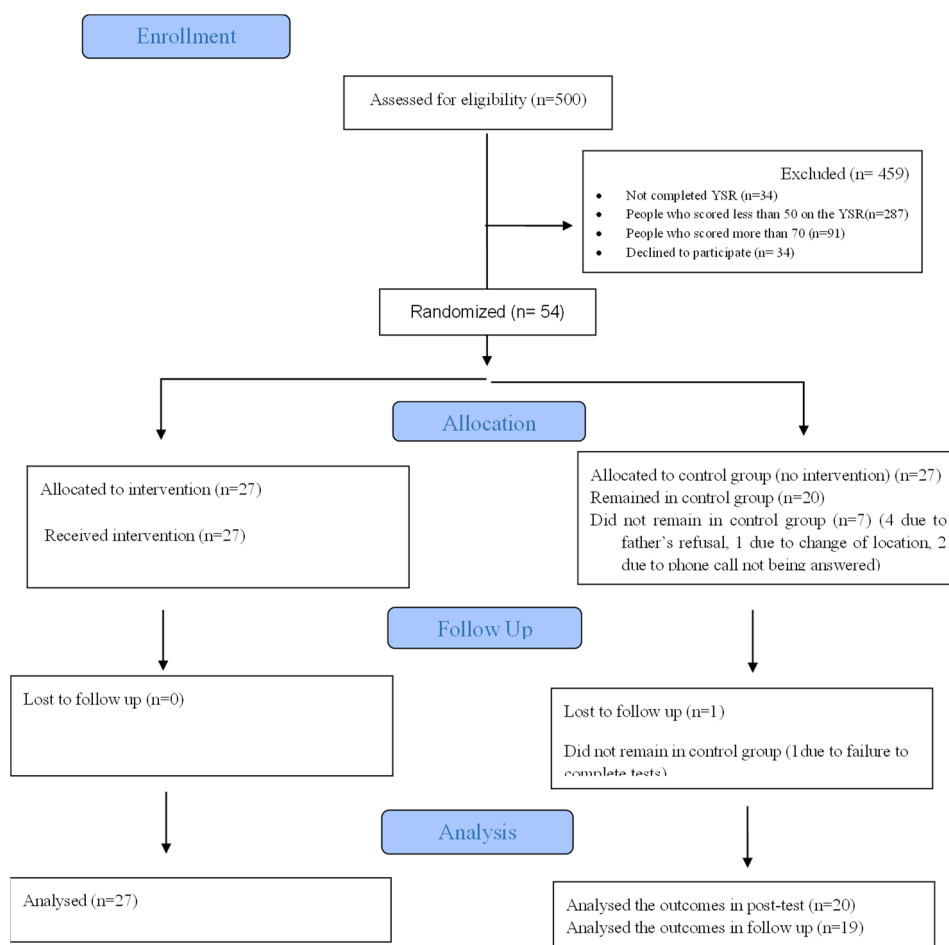


Fig. 1. CONSORT 2010 flow diagram of participants

researchers in the classroom. We set up a virtual group internet-based where the students of intervention groups to debate about their questions.

Our intervention program provided three consultation sessions to parents of the participant intervention. The sessions informed the parents about self-determination and the problems that are encountered the adolescents at risk of EBD. Each session lasted for one hour during the intervention plan for adolescents. The first session was held after the first intervention plan session. In that session, the concepts of self-determination were educated. An additional five sessions included parents of the intervention group discussing and reporting on the improvements in behavior by adolescents in self-determination.

The control group received no intervention. At the end of the study, the researcher provided comprehensive information back to the control group about the effects of the intervention in the form of a brochure, and she invited participants of the control group to receive a copy of the designed intervention free of charge.

Both groups were followed up after 10 weeks from post-test. The assessor conducted SDSS and SDPPS as a blind study of the intervention allocation.

Youth Self-Report (YSR)

The YSR has 112 items. It is a self-report questionnaire to assess the knowledge of adolescents (11 to 18 years old) about their emotional and behavioral function. The items contain eight subscales, with two broad bands (Internalizing and Externalizing) and a Total Problems Scale. Participants responded to items using a 3-point Likert scale (0 = Not true, 1=Somewhat or Sometimes True, 2=Very True or Often True). Based on a previous research, the overall internal consistency of the YSR was good ($\alpha = 0.95$)(24). Minaei et al. adapted and standardized the psychometric properties of the Persian version of the YSR (28).

Student Self-Determination Scale (SDSS)

The SDSS measurement presented by Hoffman et al. in two self-report versions examined the cognitive and emotional dimensions of self-determination. The SDSS is a 92-item self-report instrument. Students answer each item as "That's me" or "That's not me." One such item is: "I know what is important to me." Based on the Field and Hoffman self-determination model, the SDSS consists of five components namely "know-yourself" (16 items), "value-yourself" (16 items), "plan" (19 items), "act" (25 items), and "experience outcomes and learn" (16 items). This scale at

the end provides a score for each component and one score for the total student self-determination. A higher score on the SDSS indicates higher self-determination ability. The estimated time of completion is between 30 to 50 minutes. Validity and reliability of SDSS were confirmed ($\alpha=0.91$) (14). The Persian version of SDSS was prepared and confirmed in terms of psychometrics properties (29).

Self-determination Parent Perception Scale (SDPPS)

The SDPPS tool, which measures self-determination from a parent's perspective, is a 30-item scale that asks parents to rate students on the five-point Likert scale (1 = low, 5 = high) on various sections of the Field and Hoffman model (1994). Finally, five scores for each component, and by summing up the scores, the total score of the scale is obtained. The higher score in SDPPS shows a higher level of self-determination of the student from the parent's perspective. In the study of Hoffman et al., Cronbach's alpha coefficient was 0.95 (14), and the validity and reliability of the tool in the Iranian population have been verified by the authors (30).

Intervention Program

Before the intervention, a six-member expert panel was formed to decide how to implement the intervention program. The expert panel included four assistant professors and two Ph.D. students in occupational therapy who were skilled in adolescent mental health.

The intervention program was implemented in group sessions. The intervention was delivered and led by the first author. The author's role in the three groups of the intervention was leader, facilitator, and supporter. The intervention consisted of 8 sessions. Each 90-minute session occurred once a week with a rest time of 30 minutes between two forty-five minute sessions in one day. The sessions had two parts containing discussion and implementation of the activity.

At the start of a session, a description of the previous session was given to remind. The content of the discussion sections of the intervention was based on Field and Hoffman's Self-Determination Model (14). This model contains five components including: Know Yourself, Value Yourself, Plan, Act, and Experience Outcomes and Learn.

The activities were implemented along with components of self-determination in intervention sessions (Table 1). The group leader used specific therapeutic strategies derived from MOHO to interact and support students in intervention groups (31).

Statistical analyses

SPSS 16.0 software (SPSS, Inc., Chicago, IL, USA) was used for statistical analyses. For descriptive statistics, mean and standard deviation were used. Data were analyzed using the repeated measures general linear model (GLM), with three levels by time (pre, post, and follow up) and considering groups (intervention and control). Wilks' Lambda multivariate tests are reported to describe the effects of time analyzed. As the Mauchly's test of sphericity did not demonstrate the data homogeneity, the Greenhouse-Geisser test was established. Furthermore, one-way analysis of variance (ANOVA), with a 95% confidence level and Bonferroni posthoc correction, were performed to detect between-group differences. In all statistical tests, the significance level was considered as $P < 0.05$.

Results

Forty-seven adolescents at risk of EBD after attrition (20 as a control and 27 as an intervention group) with the mean age of 15.26 months ($SD=0.9$) participated in this research. Demographics are presented in Table 2.

As shown in Table 3, the mean of student self-determination in the intervention group in the post-test (Mean= 154.30, $SD= 6.11$) and follow-up (Mean= 157.00, $SD= 13.49$) has increased but in the control group the mean of student self-determination has decreased in the post-test

Table 1. Intervention Program

Session	Subject of Discussion	Activity part	Goal
1	Expressing the dreams, weaknesses, strengths, needs and preferences	students write about their physical, mental, emotional and social characteristics in pre-prepared forms, then talks about it and feedback to each other in the group.	Know yourself
2	Thinking about options, supports, expectations and wishes to create opportunities	Participants draw their dreams and express their desires and emotions through conversation and using painting.	Know yourself
3	Identifying the importance and values of life, objectify values	Using clay, they made symbolic products of their values	Value yourself
4	Creating opportunities to set long-term goals, plan actions to meet goals	They made a list of their long-term goals in different areas as a collage by selecting pictures in magazines and newspapers and pasting them into cardboard)	Plan
5	Setting Short-Term goals	They write short-term goal based on their long-term goal in the pre-prepared forms and talk about whether their goals are realistic and achievable	Plan
6	Practicing assertive skills and Communication	Role-playing about problems that they experience in communication skills in school or home, then help to each other to solve problems.	Act
7	Practice and act self-determined behavior	Cooking (preparing a meal and salad) .The students likened each member of the group to a fruit or food based on their moral characteristics and drew it.	Act
8	Experiencing consequences and learning	Arranging the environment and inviting guest (as a model of self-determined person), making photographs, summarizing the results	Experience Outcomes and Learn

Table 2. Demographic and clinical information of participants

Frequency		Intervention group		Control group	
		N	%	N	%
Age (year)	14-15	19	70.37	17	85
	15-16	8	29.62	3	15
Grade	tenth	20	74.07	18	90
	eleventh	7	25.92	2	10
Family status	Living with parents	24	88.88	15	75
	Living with mother	0	0	1	5
	Living with father	3	11.11	4	20
Family income (Millions of Iranian rials)	Less than 20	16	59.26	16	80
	Between 20 and 60	10	37.04	3	15
	More than 60	1	3.70	1	5
Mother's education	illiterate	5	18.52	4	20
	middle School	5	18.52	6	30
	diploma	14	51.85	9	45
	Bachelor	3	11.11	1	5
Father's education	illiterate	5	18.52	2	10
	middle School	12	44.44	9	45
	diploma	9	33.33	9	45
	Bachelor	1	3.70	0	0

Table 3. Descriptive statistics of student self-determination and parent perception of student self-determination in both intervention and control groups pre and post intervention and follow up

	Groups	Pre-test		Post-test		Follow up	
		Mean	SD	Mean	SD	Mean	SD
Student self-determination	Intervention	143.70	11.89	154.30	6.11	157.00	13.49
	Control	146.00	10.01	141.63	10.48	140.95	9.24
Parent perception of student self-determination	Intervention	72.56	16.15	83.56	7.34	82.26	8.28
	Control	74.05	17.61	72.42	17.18	71.79	16.05

(Mean= 141.63, SD=10.48) and follow-up (Mean= 140.95, SD=9.24) compared to the pre-test. Also, the mean of parent perception of student self-determination in the intervention group has increased at the post-test (Mean= 83.56, SD=7.34) but at the follow-up (Mean=82.26, SD=8.28) has decreased. The mean of parent perception of student self-determination in the control group at the post-test (Mean=72.42, SD=17.18) and at follow up (Mean=71.79, SD=16.05) has decreased.

A repeated-measures ANOVA with a mix of one within group effect for time (Pretest, Posttest, and Follow up) and one between group effect (intervention and control) was conducted to compare the effect of occupational therapy on student self-determination and parent perception of student self-determination. In student self-determination, the Wilks' Lambda multivariate test of overall differences among groups was statistically significant for time (Wilks'

Lambda= 0.827, , p=0.017) and for time * group (Wilks' Lambda= 0.466, p< 0.001) In the parent perception of student self-determination, the Wilks lambda multivariate test of overall differences between intervention and control groups was statistically significant for time (Wilks' Lambda= 0.810, p=0.011) and for time * group (Wilks' Lambda= 0.840P =0.024). Thus, it can be concluded that the occupational therapy interventions has been effective on student self-determination (Fig. 2) and parent perception of self-determination (Fig. 3) during the time and between the two groups.

determination and parent perception (p< 0.05), the degrees of freedom were corrected using the epsilon obtained through the Greenhouse-Geisser procedure. The result of a repeated measures ANOVA with a Greenhouse-Geisser correction detected that the effect of intervention on student self-determination has been significant for time (p= 0.040),

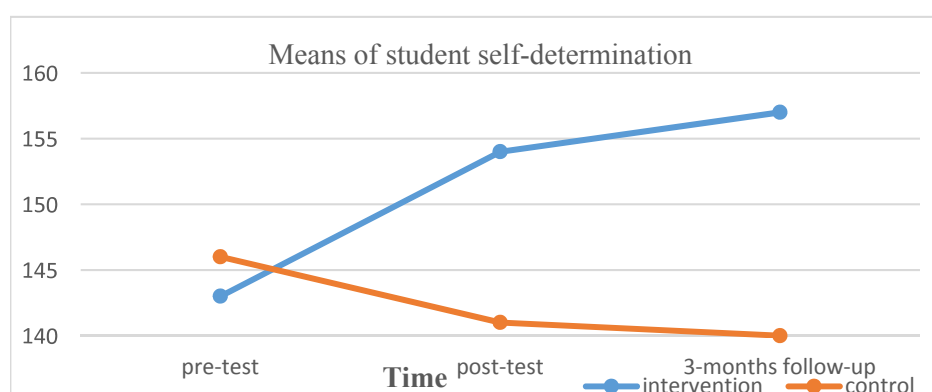


Fig. 2. Means of student self-determination assessed at pre-test, post-test, and 3-months follow-up

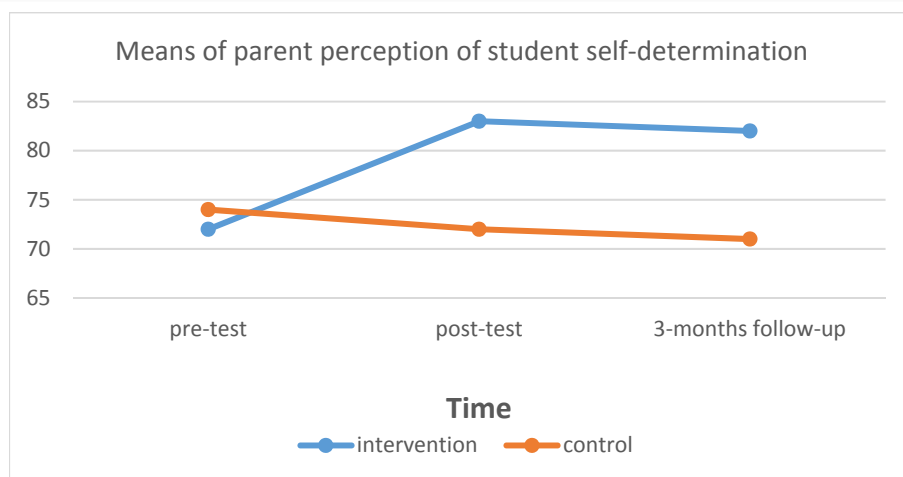


Fig. 3. Means of parent perception of student self-determination assessed at pre-test, post-test, and 3-months follow-up.

and for time * group ($p < 0.001$).

Furthermore, a repeated measures ANOVA with a Greenhouse-Geisser correction, showed that the effect of intervention on parent perception of self-determination has been significant during the time ($p = 0.032$), and for time * group ($p = 0.002$). Table 4 shows the results of the Tests of Within-Subjects Effects.

According to Table 5, the results showed that the effect of intervention between groups in student self-determination was statistically different ($p < 0.001$). Figure 2 shows that the intervention had an increasing effect in the intervention group, but self-determination decreases through time in the control group; although no significance differ-

Table 4. Tests of Within-Subjects Effects of student self-determination and parent perception

	Source		Mean square	df	F	P-value	Partial Eta Squared
Student self-determination	Time	Sphericity Assumed	411.800	2	3.629	0.031	0.076
		Greenhouse-Geisser	411.800	1.618	3.629	0.040	0.076
		Huynh-Feldt	411.800	1.709	3.629	0.038	0.076
		Lower-bound	411.800	1.000	3.629	0.063	0.076
	Time* group	Sphericity Assumed	2126.322	2	18.738	<0.001	0.299
		Greenhouse-Geisser	2126.322	1.618	18.738	<0.001	0.299
		Huynh-Feldt	2126.322	1.709	18.738	<0.001	0.299
		Lower-bound	2126.322	1.000	18.738	<0.001	0.299
	Error	Sphericity Assumed	56.740	88			
		Greenhouse-Geisser	70.127	71.20			
		Huynh-Feldt	66.395	75.20			
		Lower-bound	113.479	44.00			
Parent perception self-determination	Time	Sphericity Assumed	272.942	2	4.735	0.011	0.097
		Greenhouse-Geisser	503.739	1.084	4.735	0.032	0.097
		Huynh-Feldt	489.614	1.115	4.735	0.031	0.097
		Lower-bound	545.883	1.000	4.735	0.035	0.097
	Time* group	Sphericity Assumed	563.565	2	9.777	<0.001	0.182
		Greenhouse-Geisser	1040.110	1.084	9.777	0.002	0.182
		Huynh-Feldt	1010.946	1.115	9.777	0.002	0.182
		Lower-bound	1127.129	1.000	9.777	0.003	0.182
	Error	Sphericity Assumed	57.643	88			
		Greenhouse-Geisser	106.386	47.681			
		Huynh-Feldt	103.403	49.057			
		Lower-bound	115.286	44.000			

Table 5. Tests of Between-Subjects Effects of student self-determination and parent perception

	Source	Mean square	df	F	P-value	Partial Eta Squared
	Intercept	2902211.094	1	13140.90	<0.001	.997
Student self-determination	Group	2595.007	1	11.750	.001	.211
	Error	220.853	44			
	Intercept	775128.796	1	1668.521	<0.001	.974
Parent perception of self-determination	Group	1502.941	1	3.235	.079	.068
	Error	464.560	44			

Table 6. Post Hoc Bonferroni adjusted pairwise comparisons of student self-determination and parent perception of self-determination at pre-test, post-test and 3- months follow up

Dependent Variable	Measurement Time	Mean Difference	Standard Deviation	P-value
Student self-determination	Pretest-Posttest	-3.11	1.14	< 0.001
	Pretest- Follow up	-4.12	1.81	0.084
	Posttest- Follow up	-1.01	1.74	1.000
Parent perception of self-determination	Pretest-Posttest	-4.68	1.96	0.064
	Pretest- Follow up	-3.72	1.92	0.177
	Posttest- Follow up	0.96	0.45	0.123

ence was found in parent perception of student self-determination ($p= 0.079$). The [Figure 3](#) also indicates these results.

The results of the Bonferroni post hoc test in [Table 6](#) revealed that there was a significant difference in student self-determination between pretest-posttest ($p< 0.001$), but no significant difference between posttest and 3-month follow up ($p> 0.05$). Further results also indicate that there were no significant differences in parent perception of self-determination between pretest-posttest and posttest- follow-up ($p> 0.05$).

Discussion

The current study examined the effect of occupational therapy interventions based on MOHO and Field and Hoffman self-determination model on self-determination of adolescents at risk of EBD. The intervention group's results indicated that occupational therapy has a positive effect on student self-determination compared to the control group. Furthermore, comparing the pretest, posttest and follow-up scores revealed that self-determination has increased for participants of the intervention group. Although the mean scores of parent perception of student self-determination have increased from pretest to posttest; we found no significant differences. These findings supported the hypothesis that occupational therapy interventions could be strengthen self-determination among adolescents at risk of EBD.

Similar results has also been obtained by Juan et al., stating that occupational therapists can provide a meaningful, client-centered transition process on increasing self-determination (17). The research by Gregitis et al. proved that establishing an Occupation-Based Self-Determination program for EBD students could foster self-determination skills (23). Angell et al. determined occupational therapy is an appropriate support for students with disabilities to have self-determined behavior during adolescence to adulthood (19).

A part of the study focused on holding consultation sessions for the parents of the intervention groups. The improvement of mean scores of parent's perception about their adolescent self-determination at pretest-posttest ([Table 5](#)) occurred, but by the end of the intervention and at 3-months follow up, the mean scores have decreased. It could be concluded that the parents became more aware of the dreams, strengths, weaknesses of their children during the intervention, but perhaps the number of sessions was not enough, or the need for parents of students with EBD to counseling may remain during the adolescence. Field and Hoffman suggested that parents attend with their adolescents and perform activities with each other in sessions (32). It seems that this method causes students to interact

more with their parents and can be useful in the parent perception towards the student self-determination.

The achieved experience gained in the present study also showed that parental support and encouragement of adolescents could increase the students' willingness to engage in activities. Previous research has found that family support is important in adolescence (33, 34). It seemed that adolescents who were repressed and humiliated by their families, some of the disturbing thoughts toward their parents emerged during the projective activities in the intervention sessions; as a result, they hesitated to finish the activities that required creativity such as pottery or paintings and they were trying to abandon the practice.

Most adolescents participating in this project at the beginning of intervention sessions were impulsive and unfamiliar about their future and goals and were also uninformed and reluctant about their self-awareness and values. During the occupational therapy interventions based on MOHO concepts, they were able to increase the awareness of their interests, values, abilities, weaknesses, and performance capacity and adapt themselves to the living environment, which enhanced their motivation for future choices. The authors believe that considering the concept of MOHO can help to develop and structure the occupation-based interventions. This belief has been confirmed in previous studies (35-37).

Conclusion

The findings of this study indicated that occupational therapy interventions might be beneficial and effective for adolescents at risk of EBD to develop self-determination skills. Thus, by increasing self-awareness and self-esteem can prevent of possible future harms. Considering the findings of the present study on the role of occupational therapy interventions to enhance self-determination skills and the importance of the preventive role in adolescents at risk of EBD, it seems to be a need for further work in both clinical and research contexts.

Study limitations

It is suggested that future research can determine the effect of the present study's interventions with a range of other factors such as different ethnicity, gender, and adolescence ages since only adolescent girls at risk of EBD were examined in this study. Since students in this study couldn't attend sessions on two days of the week, the sessions were held in a day of the week with a longer time (90 min). It is suggested to implement the intervention sessions (45 min) in two days per week for future research. The intervention program of the present study can also be implemented individually by considering the conditions and

characteristics of the adolescent and the family, their needs and priorities regarding the environment and context of adolescent life. Another suggestion for future research is to administer this study in EBD adolescents with their parents and teachers. Since the importance of self-determination has been identified in adolescent transition, it is recommended that occupational therapists consider self-determination in topics of future research.

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Conflict of Interests

The authors declare that they have no competing interests.

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