Original Article

The effect of self-determination skills training on academic vitality and optimism in students with hearing loss: a quasi-experimental study

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Abstract

Background: Hearing impairment, even if mild, can delay linguistic development and negatively affect the language acquisition process. This study designed to investigate the effect of self-determination skills training on academic vitality and optimism in students with hearing loss.

Method: This was a quasi-experimental study with pretest-posttest design and control group. The sample consisted of 30 students with hearing loss in Shahroud who were selected by available sampling method and randomly and equally assigned to the experimental and control groups (15 people in each group). The experimental group participated in a self-determination skills training program that was conducted in 8 sessions of 40 minutes (one session per week), while the control group did not participate in this program. Participants were assessed using the Academic Vitality Questionnaire and Optimism Questionnaire. Data were analyzed using univariate and multivariate analysis of covariance tests and SPSS-23 software

Results: Considering the differential results of multivariate analysis of covariance for experimental and control groups in the variables of academic vitality (P = 0.001) and academic optimism (P = 0.001), the difference between the experimental and control groups is significant. According to Eta squared, it can be said that in the variables of academic vitality and academic optimism, 33% and 39% of these changes are due to intervention, respectively.

Conclusion: This study emphasizes the role of self-determination interventions in positive academic variables. This method can be used in the educational and rehabilitation program of this group of children.

Keywords: Hearing Loss; Optimism; Personal Autonomy; Rejuvenation.

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Introduction

Hearing loss is a complex sensory problem that can affect one or both ears (1). Based on the World Health Organization, there are 466 million people with hearing impairments around the world: 34 million are children (2). In Iran, the prevalence of hearing impairment is estimated as 4.8 per 1000 live births (3). Hearing impairment has a negative effect on the language acquisition process by delaying the linguistics development (4) and limits the scope of one's relationship with other healthy people and isolation (5) and has harmful effect on his or her academic performance with hearing impairment (6).

Academic vitality is one of the areas referring to the ability of students to provide a constructive and positive response to a variety of challenges (7). Since students experience high academic stress in schools, their academic vitality can be affected (8). Traumatic personal experiences, lack of academic preparedness or belonging to high-risk communities and weakness in academic perseverance are among the influential factors in this regard (9).

Academic optimism represents the belief in the student's abilities towards school and his / her academic achievement (10), which is an individual belief influenced by various environmental factors in the person (11). People with high academic optimism have a more positive attitude towards internal factors such as their abilities and external factors, such as the school environment (12).

Improving the level of academic optimism and vitality in students with hearing loss can lead to their academic success (13), which is an approach related to motivation and social performance of people (14). It supports the three basic psychological needs of independence, competence and communication and can result in social adjustment (15).

Environments with an initiative opportunity can meet psychological needs of people (16). Training self-determination skills has a greater impact on reducing students' externalized behavioral problems compared to parental management training (17). The study conducted by Ntoumanis et al., show the impact of self-determination skills training program on mental health indicators (18).

Training self-determination skills is effective in meeting the psychological needs of autonomy, competence, communication and motivation (19). The results of a research conducted by Oga-Baldwin et al., also showed that training has a positive impact on academic engagement and students' academic self-regulation (20).

Despite many studies conducted in this area, no study was found to investigate the effectiveness of this program on academic vitality and academic optimism of students with hearing loss. Thus, the present study was conducted to investigate the effectiveness of self-determination skills training on academic vitality and academic optimism in students with hearing loss.

Methods

The present study was an experimental research with a pretest-posttest design with a control group. The statistical population included all students with hearing loss in Shahroud, Iran. To conduct the present study, 30 high school students with hearing loss were selected by a convenience sampling method and were randomly and equally divided into one experimental group and one control group (15 in each group). The inclusion criteria were: having severe to deep hearing impairment, moderate to high Intelligent Quality (IQ), no other neurodevelopmental disorders, high school education and written consent to participate in the research. Exclusion criteria were unwillingness to continue cooperation and having more than two sessions of absence. Then, using the academic vitality scale (2012) and the academic optimism questionnaire (2013), the pre-test was implemented for the experimental group and the control group. Then, the members of the experimental group received the self-determination skills training program, while the members of the control group did not participate in any intervention. Finally, post-test was taken from both groups using the mentioned tests. In order to observe ethical considerations, in addition to receiving written consent from the parents of the subjects and keeping the information confidential, a two-day workshop was held for the control group at the end of the study and they were given an educational booklet about the intervention program.

The normality of data distribution was first examined and confirmed using Shapiro-Wilkes test, the assumption of homogeneity of variance was tested using Leven's test and the assumption of homogeneity slope was examined using regression test (0.05).

Measurement tool

Academic Vitality Scale: To measure academic vitality, the questionnaire developed by Hossein Chari & Dehghani Zadeh, (21), which was adapted from Martin & Marsh, questionnaire, was used (22). This questionnaire is one-dimensional and has 4 items. The answers to the questions are in the form of a 7-point Likert scale from 7 (strongly agree) to 1 (strongly disagree) and people answer each question according to the frequency of their behaviors. The reliability coefficient of the whole scale in Martin & Marsh, questionnaire using Cronbach's alpha and test-retest method is equal to 0.80 and 0.67, respectively. Also, the validity of this questionnaire was examined by factor analysis method and the factor load of items was reported between 0.65 and 0.78 (22). The number of questions was 9 items . The reliability coefficient of the whole scale using Cronbach's alpha and test-retest method was obtained at 0.80 and 0.73, respectively. The correlation range of items was reported between 0.51 and 0.68, which indicated good consistency and stability. Also, to investigate the factor structure of the questionnaire, the principal component factor analysis method with varimax rotation at the item level was used. The factor load was obtained between 0.50 and 0.64 (21).

Academic Optimism Scale: This scale, designed by Tschannen-Moran et al., has 28 questions and three subscales of academic emphasis, students' trust in teachers and unity in school. The questions are answered on a 5-point Likert scale from 1 (very low) to 5 (very high), and people answer each

Table 1. Description of intervention sessions based on self-determination

Session	Goal	Content
1	Introduction and familiarity with research goals	Communicating and introducing members, introducing the curriculum in general, stating research objectives and class rules, the benefits of improving self-determination skills, motivating regular attendance in sessions and implementing pre-tests
2	Decision-making skills training	Teaching decision-making and selection skills. Teaching decision-making steps and components
3	examining the positive and negative points	Teaching independent judgment instead of relying on the teacher's judgment, examining the positive and negative points of the person, thinking about specific individual abilities and talents, teaching how to select internal criteria
4	Teaching autonomy and self-discipline	Teaching the way of giving person the right to select, providing feedback and giving the right to criticize the content, teaching the way of proposing and suggesting
5	Reviewing previous sessions and complementary training	Performing practical activities in line with the skills of selecting, criticizing and decision making
6	Training belonging and communication skills	training the skill of cooperation and effective communication in small class groups
7	Reviewing previous sessions and complementary training	Training to receive support from important people in life and to communicate effectively in small class groups
8	Summarizing and implementing the post-test	Summarizing the taught materials, providing feedback to students and conducting surveys and post-tests

Table 2. Demographic information of the study groups

Group	Grade	Sex	Number (%)	Total
hearing loss	Second year of high school	Girl	9(60%)	15
		Son	6(40%)	
Low-talented	Second year of high school	Girl	7(47%)	15
		Son	8(53%)	

question according to the frequency of their behaviors. In this regard, the questions 17, 23 and 28 are scored in reverse. The reliability of this questionnaire using Cronbach's alpha method was obtained at 0.89 for the subscale of academic emphasis, 0.86 for students' trust in teachers, 0.91 for unity in school and 0.92 for the whole tool. Also, Tschannen-Moran et al., found a strong relationship among three subscales of this questionnaire using factor analysis (23).

In Iran, Ghadam pour et al., investigated the psychometric properties of this questionnaire. They removed 4 questions from the original version and measured the reliability of the questionnaire by calculating the Cronbach's alpha coefficient. It was obtained at 0.95 for the subscale of academic emphasis, 0.85 for students' trust in teachers, 0.90 for unity in school and 0.96 for the whole tool. The results of scale factor analysis also showed that there is a strong relationship among all three components (24).

To conduct the research, the researcher referred to high schools in Shahroud in north-east of Iran, and after selecting the sample, the subjects were randomly assigned to two experimental and control groups. Then, the experimental groups received the intervention related to the self-determination skills training program in eight 50-minute sessions and the control groups did not receive any programs**.** It should be noted that ethical considerations such as obtaining written consent from the subjects to training and participate in the research process, observing the voluntary inclusion and exclusion of participants from the research, respecting the privacy of clients and non-biased publication of results were observed. A brief description of the structure of the sessions in the self-determination skills training program, taken from the Pintrich-Schunk approach (25), is presented in Table 1**.**

It should be noted that multivariate analysis of covariance was used to examine the dependent variables and subscales of each of them. Data were analyzed using SPSS-23 software.

Results

The demographic information of the subjects is presented in Table 2. In the hearing loss group, in the grade of second year of high school, among 15 people, 9 were boys and 6 were girls. The low-talented group in the second year of high school education, among 15 people, 7 were girls and 8 boys.

Descriptive indicators including mean and standard deviation related to pre-test and post-test scores of academic vitality and academic optimism in two experimental and control groups are shown in Table 3**.**

The results of Table 3 show that the mean and standard deviation of academic vitality and academic optimism score changed before the intervention and after the intervention. In the inferential findings section, to investigate the research hypotheses and the significance of the observed changes, first analysis of covariance was used.

Table 3. Mean and standard deviation in pre-test-post-test stages in control and experimental groups

Variable	Group	Pretest		Posttest	
		Mean	SD	Mean	SD
Academic vitality	Experimental	26.60	5.31	29.66	5.96
	Control	23.86	3.38	24.06	5.56
Academic optimism	Experimental	79.80	2.24	83.93	1.51
	Control	80.06	3.76	80.33	3.80

Table 4. Multivariate analysis of covariance test results for experimental and control groups in the variables of academic vitality and academic optimism

Test type	Value	df	error df	F	P
Pillais Trace	0.52	2	25	13.79	0.001
Wilks Lambda	0.47	2	25	13.79	0.001
Hotelling's Trace	1.10	2	25	13.79	0.001
Roy's Largest Root	1.10	2	25	13.79	0.001

The results of Table 3 show that the mean and standard deviation of academic vitality and academic optimism score changed before the intervention and after the intervention. In the inferential findings section, to investigate the research Wilkes test, the assumption of homogeneity of variance was tested using Leven's test and the assumption of homogeneity slope was examined using regression test (0.05).

Table 4 shows the results of analysis of covariance for experimental and control groups in the variables of academic vitality and academic optimism. Based on the results of Table 3, it can be estimated that the experimental and control groups in at least one of the dependent variables have significant differences (P <0.001). To understand this difference, the results of multivariate analysis of covariance are reported in Table 4.

As the results of Table 5 show, considering the pre-test scores as covariates, the difference between experimental and control groups in terms of academic vitality (P = 0.001) and academic optimism (P = 0.001) is significant. Based on Eta squared, it can be stated that in the 33% and 39% of the changes in the variables of academic vitality and academic optimism, respectively, are due to intervention.

hypotheses and the significance of the observed changes, first analysis of covariance was used. For this purpose, the normality of data distribution was first examined and confirmed using Shapiro-

Discussion

The results of analysis of covariance showed that the difference between experimental and control groups in terms of academic vitality and academic optimism was significant. Therefore, based on the mean scores, it can be stated that interventions based on self-determination have an impact on the academic vitality and academic optimism of students with hearing loss. The results of the present study are in line with the results of studies conducted by Bodaqi & Sheikh al-Islami, (13) and Oga-Baldwin et al., (20).

In explaining the result that self-determination skills training affects the academic vitality of students with hearing loss, it can be stated that supporting competence and autonomy is essential for growth and well-being in any learning environment. At each level of education, students whose needs are better met are better able to adjust to the situation in the classroom and school and show better self-regulation in relation to school. Also, they will be more motivated intrinsically than

Table 5. Results of multivariate analysis of covariance test for experimental and control groups in the variables of academic vitality and academic optimism

Sources of Change	Dependent variables	SS	df	MS	F	P	η2
Pre-test	Academic vitality	812.89	1	812.89	189.82	0.001	0.088
	Academic optimism	2785.41	1	2785.41	464.75	0.001	0.94
Group membership	Academic vitality	56.43	1	56.43	13.17	0.001	0.33
	Academic optimism	101.19	1	101.19	16.88	0.001	0.39

students whose needs are not met at school (26). Thus, it can be stated that students' perception of their competence affects their academic motivation and vitality.

Also, training of self-determination skills training begins with two dimensions of self-knowledge and self-worth. Self-knowledge involves identifying one's strengths and weaknesses, important needs and preferences, and deciding what is important to him or her. Self-worth includes praising one's strengths, recognizing one's rights and responsibilities, and self-care (25). Students with hearing loss gain a better understanding of themselves by knowing themselves and valuing themselves more and more, apart from their problems.

They can also have more positive explanations in the face of events. All of these factors strengthen their academic vitality. In explaining this result that self-determination skills training has an effect on the academic optimism of students with hearing loss, it can be stated that in the process of self-determination skills training, students create solutions to their problems and deal with the environment appropriately using goal-setting techniques, planning and acting based on goals and programs. Thus, activities such as goal setting, planning and action can increase optimistic explanatory style and reduce pessimistic explanatory style in students (27).

Also, students with hearing loss attribute failure to low ability and attribute success to chance when they experience repeated failures in the school environment. Thus, if the issues are properly identified and defined by the students and proper targeting and planning are done, they will go through the half of the path of self-determination process, which can result in increased individual success. Thus, the person will feel more that he or she can influence the environment and will have a more optimistic explanatory style than those around him.

Recommendations

To generalize the results of the effectiveness of the intervention, it is recommended to use larger samples, use longer sessions and use the follow-up stage. Also, due to the effectiveness of this intervention on academic vitality and academic optimism, it is recommended to use this intervention as an effective treatment course to improve the academic skills of students in schools and counseling centers by specialists.

Conclusion

In general, given the importance of the present study and the role of self-determination interventions in positive academic variables and the need to design and apply self-determination interventions in educational situations, it seems that the results of the study on the effectiveness of self-determination skills training on academic vitality and student optimism can be used by professors and planners in the above-mentioned areas.

Research Limitations

The present study, like any other studies, faces some limitations. These limitations include not controlling all disturbing variables such as attention and concentration, fatigue and health status of the subjects, relatively short time of interventions, impossibility to implement the follow-up stage due to special conditions of students and limitations of the academic year and the small sample of the study. Thus, these limitations should be considered in generalizing and relying on the results of this research.

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Author's contribution

Zahra Tabatabii and Ghasem Norouzi developed the study concept and design. Ahmad Abedi acquired the data. Zahra Tabatabii and Ghasem Norouzi analyzed and interpreted the data, and wrote the first draft of the manuscript. All authors contributed to the intellectual content, manuscript editing and read and approved the final manuscript.

Informed consent

Questionnaires were filled with the participants' satisfaction and written consent was obtained from the participants in this study.

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Conflict of interest

The authors declare that they have no conflict of interests.

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