The Impact of Meurofeedback-Based Therapy on Reducing Test Anxiety and Shyness of Female Students at Competitive Dxamination Level

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Abstract

The main objective of this study was to evaluate the effect of neurofeedback-based treatment in reducing test anxiety and shyness of female students at competitive examination level in Ahvaz. The sample consisted of 40 students at competitive examination level that were selected by available sampling method from students referred to Ahvaz Aramesh counseling clinic, which were randomly divided into two experimental (n=20) and control (n=20) groups. The tools used were Friedman Test Anxiety Questionnaire (1997) and Stanford Shyness Questionnaire (1997). The experimental group received fifteen 30-minute sessions (three sessions per week) of neurofeedback treatment program. The study design was a semi-experimental and pretest-posttest one with control group. The results obtained using analysis of variance (ANCOVA) at significance level of α=0.05 showed that the neurofeedback-based therapy has an impact on reducing test anxiety and shyness of female students at competitive examination level in Ahvaz.

Keywords: neurofeedback treatment, test anxiety, shyness

1. Introduction

Today, much research has been done on treatment of epilepsy by neurofeedback with reports indicating about 70% of patients' treatment and 82% reduction of sudden seizures in patients under treatment. Although most patients continued taking the drug after neurofeedback, but neurofeedback has led to a 90% reduced risk of attacks (Ghoshoni, 2016). Also, anxiety a part of every human life, exits in everyone in a balanced level, which is seen as an adaptive response. Thus, one can argue that if there was no anxiety, all of us would fall in sleep behind our desks. Lack of anxiety may lead us facing with considerable difficulties and dangers. Therefore, anxiety as a part of every man's life comprises one of the components of his personality structure. From this point of view, some of the anxieties of childhood and adolescence can be considered normal and their positive effect on the process of development (transformation) may be accepted. In other words, one can say that anxiety creates construction and creativity in people in some cases. On the contrary, there is a morbid anxiety, since some level of anxiety can be constructive and useful that most people have to experience it, but it may also become chronic and persistent; in such case, not only the response cannot be considered adapted, but it should be seen as a source of the individual's failure and desperation that deprives the person from a major part of his possibilities, meanwhile developing a wide range of disorders from known anxiety disorders to unjustified fears and frights (Dadsetan, 2012). Anxiety is a term to express normal feelings experienced by people while facing with fear, danger, or pressures and stresses (Safooraii Parizi, 2016). Feeling anxious in these situations is right, and we usually feel anxious for a short time. Test anxiety is a special kind of anxiety that is characterized with physical, cognitive and behavioral symptoms when preparing for exams and doing tests. It turns to a problem when the high level of such anxiety interferes with preparing for the exam and doing the test (Latas et al., 2010). Addressing the phenomenon of shyness and its psychological foundations seems to be important as almost all of us have had some experiences of shyness in different situations. But more importantly, some people become subject to significant shyness in all social terms and situations. Thus, one can say that the vast majority of people have somehow experienced shyness in some points of their social life. Neurofeedback is a new and highly

effective treatment technology. This treatment was first used in America, and by revealing its positive effects, it has spread to Europe and the rest of the world. Very good and long-lasting therapeutic effects, lack of negative side effects and short period of treatment compared to other treatments led to approval of this treatment method by the American Food and Drug Administration. Neurofeedback treatment is currently used on a wide range of mood and cognitive disorders. Recording EEG, neurofeedback prepares the brain function as computerized information and provides such physiological information, which represent through brain waves (Schwartz & Andrasik, 2003). When people have normal anxiety levels, blood flow supply and activity of certain areas of the brain associated with attention, focus and learning become more and better. However, when anxiety is severe and disproportionate, it would adversely affect the individual's academic performance. Then, at the time of learning time, the individual will have no focus and attention and anxious; he cannot start or finish his homework; his ability to recall things from memory and using them at tests and exams will reduce, and cannot sleep well at nights, and such insomnia will lower his focus and attention.

In a study, Jahanian Najafabadi et al. (2014) investigated the effect of neurofeedback training on reducing anxiety in those referred to the counseling and psychological services clinic in the city of Isfahan. The results of analysis of covariance showed that neurofeedback training is effective in reducing anxiety, and indicated that neurofeedback can significantly reduce the anxiety of participants in the research. In a study, Narimani, Rajabi and Delavar (2014) investigated the effects of neurofeedback on reducing symptoms of hyperactivity and attention deficit in students. The results indicated the efficacy of neurofeedback as a therapy approach in the treatment of attention problems and reduced hyperactivity symptoms among female students with attention deficit-hyperactivity disorder compared with the control group. In a research, Yaghoubi et al. (2009) did a comparative study on the effectiveness of neurofeedback, Ritalin and a combined therapy in reducing symptoms in children with hyperactivity attention deficit disorder. The results showed that the combined approach of neurofeedback therapy associated with Ritalin is more effective than each of these methods alone. The effectiveness rate of neurofeedback was as Ritalin; although parental satisfaction rate (reflected in the Connors posttest scores) of neurofeedback method was more than medication.

Wang et al. (2013) performed a study as "Biofeedback improves the high rate of biasing trait in anxious individuals". Biofeedback significantly reduced attentional bias trait in the anxiety of subjects.

Doric et al. (2012) performed a study entitled as "Neurofeedback in treating children and adolescents with ADHD". In their study, 91 children and adolescents in terms of age, gender, intelligence and random distribution of ADHD symptoms were examined. Parental reports showed a significant effect of the treatment used. Zhoe et al. (2009, quoted by Jahanian Najafabadi et al., 2014) studied the effectiveness of neurofeedback and biofeedback on academic performance of a group of student. The study findings showed that neurofeedback, along with biofeedback, can significantly improve test anxiety, depression and mood of the students. In their study, Gevensleben et al. (2009) investigated that whether neurofeedback is an effective treatment for attention deficit-hyperactivity disorder. The results indicated a significant impact in reducing the symptoms of ADHD, but the subjects' attitudes toward treatment showed no differences in two control and experimental groups. Zhoe et al. (2009) studied the effectiveness of neurofeedback and biofeedback on academic performance of a group of student. The study findings showed that neurofeedback, along with biofeedback, can significantly improve test anxiety, depression and mood of the students. Moore (2004) reviewed the background related to the treatment of anxiety disorders through neurofeedback training (GAD: 8 studies; Phobia disorder: 3 studies; OCD: 2 studies; Post-traumatic stress: 1 study). Training sessions were short in most of these studies. However, alpha training increased alpha wave production from 64% to 78%, and the anxiety scores significantly decreased for a group used the combined therapy compared to the non-treated group. Due to the increasing anxiety in students at competitive examination level and poor performance of anxious students in the exam session, this research was trying to answer this question whether neurofeedback-based therapy can affect the exam anxiety reduction and shyness of female students of Ahwaz?

2. Research Hypotheses

Hypothesis 1: The neurofeedback-based therapy has an impact on reducing test anxiety (social humiliation, cognitive error, stress) of students.

Hypothesis 2: The neurofeedback-based therapy has an impact on reducing shyness of students.

3. Method

3.1 Study Population, Samples and Sampling Method

The study population consisted of all female students at competitive examination level in the city of Ahwaz who had referred to Aramesh Center counseling clinic in Ahvaz during the time of study (2016). The samples were matched based on a clinical interview and gaining a standard deviation higher than the average on test anxiety questionnaire and shyness questionnaire, socioeconomic status and other variables of interest. The study sample included 40 individuals who were selected by available sampling method and randomly divided into two experimental (n=20) and control (n=20) groups.

3.2 Research Design

This study was based on pre-test and post-test design with control group with a quasi-experimental approach. The experimental and control groups were matched randomly. Then, they completed Friedman's Test Anxiety and Stanford Shyness questionnaires. The experimental group received fifteen 30-minute sessions of neurofeedback treatment program (three sessions per week). Then, the two groups again completed Friedman's test anxiety and Stanford shyness questionnaires. The differences between pre-test and posttest of each group were evaluated in terms of significance.

Table 1. Research outline

Group	Pre-test	Independent variable	Post-test
Experimental	T1	X	T2
Control	T1	_	T2

The goal was to reduce anxiety and familiarity with treatment goals and treatment process. The treatment was planned based on anxiety and shyness protocols.

Instructions of session 1: Recording the profile, Getting familiar, Counseling, Measuring head and Doing the EEG. To do this, the student sits in a comfortable armchair in front of a monitor. The therapist measures particular points and connects the electrodes at designated points. The treatment protocol is written based on the EEG.

Instructions of sessions 2 and 3: Training deep-breathing exercises (to reduce anxiety) based on the written protocols (each session, three 10-minute protocols to be worked) Fz in front of the head to reduce anxiety, soft sleep adjustment, Pz behind the head to increase theta and alpha to reduce anxiety and increase relaxation, F4 on the right side of the head to reduce anxiety and increase incentive.

Instructions of session 4: Training deep-breathing exercises, Doing relaxation protocol (pz) along with songs without words, Visualization and Repeating the protocols of previous sessions.

Instructions of session 5: Doing deep breathing, a 5-minute counseling with the aim of realizing positive self-assessments and increasing self-confidence, Implementation of previous protocols.

Instructions of sessions 6 and 7: Doing deep breathing, Doing 10-minute protocols, At the end, 15 minutes assignments every night: Before bed, to lit up a candle and focus on its burning to reduce anxiety and increase concentration, Attending friends and speaking, in the first stage, with those easier to communicate.

Instructions of sessions 8 and 9: Doing deep breathing, Performing relaxation and anxiety protocols and a new F3 protocol in which three indices of disturbing thoughts, sleep and learning are controlled, encouraging to go in social situations, writing prominent and positive features of self and positive assessments of them, Talking about interpersonal relationships.

Instructions of session 10: Doing deep breathing, Training self-relaxation and Doing it daily, Doing treatment protocols.

Instructions of sessions 11 and 12: Doing deep breathing, Doing relaxation protocol with instrumental songs with the sound of sea, Positive visualization to reduce anxiety, Positive suggestion of individual capabilities.

Instructions of sessions 13 and 14: Doing deep breathing, Performing therapeutic protocols, Encouraging walking out with friends, Training skills to establish desirable social relationships with others.

Instructions of session 15: Doing deep breathing, Performing therapeutic protocols, Talking about the progress of their ability to enhance communication and control anxiety.

3.3 Measurement Tool

Data collection data in this study included gathering information from subjects in the field, literature and literature background by library method. Data collection tool included Friedman test anxiety questionnaire and Stanford Shyness Inventory.

Friedman's test anxiety questionnaire:

The questionnaire has 23 questions with the purpose of assessing different aspects of test anxiety (social humiliation, cognitive error, stress). Its response spectrum was a Likert-type, but the scoring method is reversed regarding the questions 1, 2, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 20, 21 and 22. In this study, the Cronbach alpha test values are given in the following table for the Friedman's test anxiety:

Table 2. Cronbach's alpha values in test anxiety inventory

Dimension	Cronbach's alpha
Social humiliation	0.90
Cognitive error	0.85
Stress	0.83
Total	0.91

3.4 Stanford Shyness Questionnaire

The questionnaire has 40 questions, and aims to assess the shyness of individuals. Its response range was a Likert type. To get the questionnaire overall score, the scores of all your questions should be summed together. This score would have a range from 40 to 160. In Nadi Najaf Abadi et al.'s (2014) studies, the structure validity of the questionnaire was obtained as 0.74 and approved. In the present study, the Cronbach's alpha for Stanford Shyness Inventory was obtained as 0.87.

3.5 Neurofeedback Device

In the present study, the neurofeedback therapy approach was performed by using devices equipped with computerized systems and the researcher supervising. This device includes Procomp 5 hardware from Thought Technol Ltd Company and Infiniti BioGeraph software. Initially, the neurofeedback receiving group, according to the treatment protocol, were given fifteen 30-minute sessions of neurofeedback treatment with increased alpha wave, while the control group received no treatment neurofeedback. To capture alpha wave activity, while the subjects are sitting on a chair placed in front of the monitor screen, according to the international 20-10 system, an active electrode of EEG recording at O1 and O2 regions and two reference and ground electrodes were respectively placed on the right and left ears. Each subject receives 15 sessions of neurofeedback during 5 weeks. All sessions include 5 minutes to reach the initial calmness, 2 minutes of recording baseline data and 30 minutes of healing process. Providing audio bonuses is provided to supply the criteria set in the first sessions that had been explained to the subjects.

4. Results

The descriptive findings of this study included statistics indices such as mean, standard deviation and number of sample subjects for all variables in this study are presented in Table 1.

Table 3. Mean and SD of test anxiety and shyness scores of experimental and control groups in the pre-test and post-test and follow-up stages

Variable	Stage	Statistical index Group	Mean	SD	Number
Test Anxiety	Pre-test	Experimental	58.80	4.57	20
		Control	58.60	3.99	20
	Posttest	Experimental	30.95	5.96	20
		Control	59.40	4.09	20
	Follow-up	Experimental	31.92	5.18	20
		Control	58.42	3.68	20
Shyness	Pre-test	Experimental	97.15	21.23	20
		Control	98.45	17.94	20
	Posttest	Experimental	63.40	12.56	20
		Control	98.05	17.51	20
	Follow-up	Experimental	63.48	12.62	20
		Control	97.15	17.42	20

As can be seen in Table 3, in the pre-test phase, the values of mean and standard deviation of test anxiety of each of the experimental and control groups are respectively as 58.80 and 4.57 and 58.60 and 3.99, while the values of mean and standard deviation in the posttest phase are equal to 31.95 and 5.96 and 59.40 and 40.09, respectively. In shyness variable, in the pre-test stage, the values of mean and standard deviation for experimental and control groups are respectively as 97.15 and 21.23 and 98.45 and 17.94, while in the post-test stage, the values of mean and standard deviation are equal to 63.40 and 12.56 and 98.05 and 17.51, respectively.

Table 4. Results of Levin test regarding the pre-assumption of equality of scores variances of the research variables between the two groups of the population

Test anxiety variable	F	First degrees of freedom	Second degrees of freedom	Significance level
Pretest	0.663	1	38	0.421
Posttest	0.322	1	38	0.574

As can be seen in Table 4, the null hypothesis of equality of scores variances of the two groups for test anxiety variable is confirmed. This means the pre-assumption of equality of scores variances in both experimental and control groups was confirmed. However, when the samples sizes are equal, the significance of Levine test will not have a significant impact on nominal alpha level.

Table 5. Results of Levin test regarding the pre-assumption of equality of scores variances of the research variables between the two groups of the population

Shyness variable	F	First degrees of freedom	Second degrees of freedom	Significance level
Pretest	0.612	1	38	0.439
Posttest	1.113	1	38	0.298

As can be seen in Table 5, the null hypothesis of equality of scores variances of the two groups for shyness variable is confirmed. This means the pre-assumption of equality of scores variances in both experimental and control groups was confirmed. However, when the samples sizes are equal, the significance of Levine test will not have a significant impact on nominal alpha level.

Table 6. Results of the Kolmogorov-Smirnov test regarding assumption of normal distribution of test anxiety scores

Variable	Number	Mean	F	Significance level
Test anxiety	40	58.70	0.604	0.859

As seen in Table 6, as achieved significant level on test anxiety variable is higher than the significance level (0.05), therefore, the assumption of normal distribution of mental health scores is confirmed.

Table 7. Results of the Kolmogorov-Smirnov test regarding assumption of normal distribution of shyness scores

Variable	Number	Mean	F	Significance level
Shyness	40	97.80	0.765	0.603

As seen in Table 7, as achieved significant level on shyness variable is higher than the significance level (0.05), therefore, the assumption of normal distribution of shyness scores is confirmed.

Hypothesis 1: The neurofeedback-based therapy has an impact on reducing test anxiety (social humiliation, cognitive error, stress) of female students at competitive examination level.

Table 8. The results of one-way analysis of covariance on the post-test scores mean of test anxiety of female students at competitive examination level in experimental and control groups with pre-test

Variable	Source of changes	Sum of squares	Degrees of freedom	Mean of squares	F	Significance level of P	Eta squares	Statistical power
Anxiety	Pre-test	266.090	1	266.090	10.06	0.0001	0.214	1
	Group	7548.91	1	7548.91	285.61	0.0001	0.855	1
	Error	977.83	37	26.42				

As shown in Table 8, in pre-test control, there are significant differences between female students of experimental and control groups on test anxiety variable (p<0.0001 and F=285.61); thus, the first hypothesis is confirmed. In other words, according to the mean values of female students, the neurofeedback-based therapy reduced the test anxiety of the experimental group compared to the control group. The rate of effect or difference is equal to 0.85. In other words, 85% of individual differences in the scores of test anxiety posttest are related to the effect of neurofeedback-based therapy. The statistical power is equal to 1.00. In other words, there has not been the possibility of type-II error.

Hypothesis 1-1: The neurofeedback-based therapy has an impact on reducing social humiliation component of test anxiety of female students at competitive examination level.

Table 9. The results of one-way analysis of covariance on the post-test scores mean of social humiliation component of test anxiety of female students at competitive examination level in experimental and control groups with pre-test

Variable	Source of changes	Sum of squares	Degrees of freedom	Mean of squares	F	Significance level of P	Eta squares	Statistic al power
Anxiety	Pre-test	32.285	1	32.285	9.46	0.0004	0.204	1
	Group	974.89	1	974.89	281.51	0.0001	0.884	1
	Error	128.89	37	3.463				

As shown in Table 9, in pre-test control, there are significant differences between female students of experimental and control groups on social humiliation component of test anxiety variable (p<0.0001 and

F=281.51); thus, the first hypothesis is confirmed. In other words, according to the mean values of female students, the neurofeedback-based therapy reduced the social humiliation component of test anxiety of the experimental group compared to the control group. The rate of effect or difference is equal to 0.88. In other words, 88% of individual differences in the scores of social humiliation component of test anxiety posttest are related to the effect of neurofeedback-based therapy. The statistical power is equal to 1.00. In other words, there has not been the possibility of type-II error.

Hypothesis 1-2: The neurofeedback-based therapy has an impact on reducing cognitive error of test anxiety of female students at competitive examination level.

Table 10. The results of one-way analysis of covariance on the post-test scores mean of cognitive error of test anxiety of female students at competitive examination level in experimental and control groups with pre-test

Variable	Source of changes	Sum of squares	Degrees of freedom	Mean of squares	F	Significance level of P	Eta squares	Statistical power
	Pre-test	79.511	1	79.511	15.302	0.0001	0.293	0.968
Anxiety	Group	835.930	1	835.930	160.87	0.0001	0.813	1
	Error	192.261	37	5.196				

As shown in Table 10, in pre-test control, there are significant differences between female students of experimental and control groups on cognitive error component of test anxiety variable (p<0.0001 and F=160.871); thus, the first hypothesis is confirmed. In other words, according to the mean values of female students, the neurofeedback-based therapy reduced the cognitive error component of test anxiety of the experimental group compared to the control group. The rate of effect or difference is equal to 0.81. In other words, 81% of individual differences in the scores of cognitive error component of test anxiety posttest are related to the effect of neurofeedback-based therapy. The statistical power is equal to 1.00. In other words, there has not been the possibility of type-II error.

Hypothesis 1-3: The neurofeedback-based therapy has an impact on reducing stress component of test anxiety of female students at competitive examination level.

Table 11. The results of one-way analysis of covariance on the post-test scores mean of stress component of test anxiety of female students at competitive examination level in experimental and control groups with pre-test

Variable	Source of changes	Sum of squares	Degrees of freedom	Mean of squares	F	Significance level of P	Eta squares	Statistical power
	Pre-test	128.684	1	128.684	16.69	0.0001	0.310	1
Anxiety	Group	1002.463	1	1002.463	129.38	0.0001	0.878	1
	Error	286.675	37	7.784				

As shown in Table 11, in pre-test control, there are significant differences between female students of experimental and control groups on stress component of test anxiety variable (p<0.0001 and F=129.38); thus, the first hypothesis is confirmed. In other words, according to the mean values of female students, the neurofeedback-based therapy reduced the stress component of test anxiety of the experimental group compared to the control group. The rate of effect or difference is equal to 0.87. In other words, 87% of individual differences in the scores of stress component of test anxiety posttest are related to the effect of neurofeedback-based therapy. The statistical power is equal to 1.00. In other words, there has not been the possibility of type-II error.

Hypothesis 2: The neurofeedback-based therapy has an impact on reducing shyness of female students at competitive examination level.

Table 12. The results of one-way analysis of covariance on the post-test scores mean of shyness of female students at competitive examination level in experimental and control groups with pre-test

Variable	Source of changes	Sum of squares	Degrees of freedom	Mean of squares	F	Significance level of P	Eta squares	Statistical power
Shyness	Pre-test	944.764	1	944.764	8.34	0.0001	0.186	1
	Group	1148.55	1	1148.55	49.20	0.0001	0.533	1
	Error	4145.074	37	112.029				

As shown in Table 12, in pre-test control, there are significant differences between female students of experimental and control groups on shyness variable (p<0.0001 and F=49.20); thus, the second hypothesis is confirmed. In other words, according to the mean values of female students, the neurofeedback-based therapy reduced the shyness of the experimental group compared to the control group. The rate of effect or difference is equal to 0.53. In other words, 53% of individual differences in the scores of shyness posttest are related to the effect of neurofeedback-based therapy. The statistical power is equal to 1.00. In other words, there has not been the possibility of type-II error.

5. Discussion & Conclusion

Hypothesis 1: The neurofeedback-based therapy has an impact on reducing test anxiety of female students at competitive examination level in Ahvaz.

Hypothesis 1-1: The neurofeedback-based therapy has an impact on reducing social humiliation component of test anxiety of female students at competitive examination level in Ahvaz.

Hypothesis 1-2: The neurofeedback-based therapy has an impact on reducing cognitive error of test anxiety of female students at competitive examination level in Ahvaz.

Hypothesis 1-3: The neurofeedback-based therapy has an impact on reducing stress component of test anxiety of female students at competitive examination level in Ahvaz.

These findings are consistent and coordinating with the results of research by Jahanian Najafabadi et al. (2014), Wang et al. (2013), Zhou et al. (2009), Garrett and Silver (1976) and Hammond (2005). These findings are consistent and coordinating with the results of Jahanian Najafabadi et al. (2014) that investigated the effect of neurofeedback training on reducing anxiety in those referred to the counseling and psychological services clinic in the city of Isfahan. The results of analysis of covariance showed that neurofeedback training is effective in reducing anxiety, and indicated that neurofeedback can significantly reduce the anxiety of participants in the research. These findings are also consistent and coordinating with the results of Wang et al. (2013) study as "Biofeedback improves the high rate of biasing trait in anxious individuals". Biofeedback significantly reduced attentional bias trait in the anxiety of subjects. They are also consistent and coordinating with the results of study by Zhoe et al. (2009) who studied the effectiveness of neurofeedback and biofeedback on academic performance of a group of student. The study findings showed that neurofeedback, along with biofeedback, can significantly improve test anxiety, depression and mood of the students. They are consistent and coordinating with the results of study by Gareth and Silver (1976) as well. Their study included a randomized selection, four different treatment groups and a control group of waiting list. In one study, a significant decrease was observed in test anxiety, while no significant decrease was seen in the untreated control group and relaxation training group. Other individuals also received courses of neurofeedback training and muscle biofeedback training. In these subjects, the anxiety scores significantly decreased compared with the untreated group.

They are also consistent and coordinating with the results of Hammond (2005), who performed a study entitled as "Neurofeedback with anxiety and emotional disorders". The findings of this show that neurofeedback in addition to biofeedback can significantly improve test anxiety, depression and mood. They are also consistent and coordinating with the results of Godoy (2005) who showed in his study that the efficacy of existential psychotherapy on the levels of social anxiety (associated with shyness), depression and quality of life in pulmonary patients is more than the cognitive-behavioral approach. Explaining this finding, one can say that principally the mental image and cognitive assessment of each individual are related to his situation and failure. It is often seen that the students suffering from test anxiety have negative and unrealistic thoughts of their own, do not consider themselves competent and deserving individuals and have a strong fear of failure. In fact, this is not anxiety that directly leads to reduced performance and low score of an individual in a test, but the thoughts of

unsuccessful people associated with anxiety are the main cause of this problem. Also, an important part of cognitive symptoms of test anxiety involves negative thoughts and self-talks. Other symptoms include inability to organize thoughts, difficulty in concentrating, difficulty in remembering words and key concepts, disturbing thoughts about performing better than others and comparing themselves with others.

Hypothesis 2: The neurofeedback-based therapy has an impact on reducing shyness of female students at competitive examination level in Ahvaz.

The results in Table 4-7 showed that neurofeedback-based treatment has an impact reducing shyness of female students at competitive examination level in Ahvaz, and the hypothesis was confirmed. Specifically, no study was found to compare it with the results of this finding. However, one can say that these findings are consistent and coordinating with the results of research by Jahanian Najafabadi et al. (2014), Wang et al. (2013), Zhou et al. (2009), Garrett and Silver (1976) and Hammond (2005). These findings are consistent and coordinating with the results of Jahanian Najafabadi et al. (2014) that investigated the effect of neurofeedback training on reducing anxiety in those referred to the counseling and psychological services clinic in the city of Isfahan. The results of analysis of covariance showed that neurofeedback training is effective in reducing anxiety, and indicated that neurofeedback can significantly reduce the anxiety of participants in the research. These findings are also consistent and coordinating with the results of Wang et al. (2013) study as "Biofeedback improves the high rate of biasing trait in anxious individuals". Biofeedback significantly reduced attentional bias trait in the anxiety of subjects. They are also consistent and coordinating with the results of study by Zhoe et al. (2009) who studied the effectiveness of neurofeedback and biofeedback on academic performance of a group of student. The study findings showed that neurofeedback, along with biofeedback, can significantly improve test anxiety, depression and mood of the students. They are consistent and coordinating with the results of study by Gareth and Silver (1976) as well. Their study included a randomized selection, four different treatment groups and a control group of waiting list. In one study, a significant decrease was observed in test anxiety, while no significant decrease was seen in the untreated control group and relaxation training group. Other individuals also received courses of neurofeedback training and muscle biofeedback training. In these subjects, the anxiety scores significantly decreased compared with the untreated group.

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