

Effectiveness of Mindfulness on Test Anxiety and Educational Well-being in Secondary School Female Students

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Abstract

Introduction: The present study was aimed to assess the effectiveness of mindfulness on test anxiety and educational well-being in secondary school female students.

Method: The study has been conducted based on a semi-experimental design of pretest-posttest type with a control group and a follow up stage. Forty students were selected based on a purposive sampling method and were assigned to two groups: (control and experimental groups, Each containing 20 individuals) based on a simple randomized method. One of the experimental group received mindfulness training for a period of 10 sessions, each lasting for 45 minutes (twice a week). Data analysis was conducted using Multivariate Covariance Analysis (MANCOVA) and ANCOVA's single-variable analysis method using SPSS software.

Results: The results of MANCOVA showed a positive and significant effect of mindfulness training on test anxiety and academic well-being. Also, the results of treatment in the follow-up test were stable after one and a half months.

Conclusion: According to the findings of this study it can be stated that mindfulness training can help reduce test anxiety and improve academic well-being.

Keywords: Mindfulness, Test Anxiety, Educational Well-being

Introduction

Students are one of the most important sectors of every society with the greatest amount of community budgeting and planning [1]. Therefore, one of the most important tasks of education in any country is to pay attention to the development of individuals in all aspects and to promote talented, healthy and balanced individuals, as well as to prepare efficient human resources in various social, cultural and economic sectors of the society. It should be noted that students have an important place because the growth and prosperity of the community will be the end result of the growth and prosperity of the students in that community. However, only a limited number of students in the education system can thrive and have good academic performances, the rest of the students for various reasons cannot achieve full success on this path. Academic well-being is one of the most important factors that improves student achievement and academic performance [2]. Academic well-being was developed with the aim of linking emotional and academic performance as well as optimizing the school-to-student relationship. This concept was first introduced by Tomenin-Sweeney et al. [3]. They defined academic well-being in four dimensions. The first dimension is the value of the school which means the value of the school to the student. It also includes the meanings and goals he or she pursues in school [4]. The second dimension is school burnout, which is defined as a pessimistic attitude towards school and a feeling of inadequacy in learning [5]. In the other dimension, academic satisfaction is referred to as

the feeling of pervasive satisfaction with the choice of goal and educational path [4]. The fourth level is school work engagement, which means focusing, sustaining, and engaging in all school affairs [6].

Students' academic well-being in the academic environment prevents fatigue from the necessary academic frameworks and homework, negative attitudes towards the classroom and school environment, as well as creating a passion and interest in homework and a sense of efficiency [7] and emphasizes the active overarching role of creating a favorable environment in the school [8]. Some researchers, such as Engels et al., have shown that students' perceptions of the school environment, the structure of the educational environment, and the relationship of students to teachers are characteristics of academic well-being. Students with high academic well-being have positive emotions, while students with low academic well-being have rated their events and academic performance as unfavorable. They experience more negative emotions such as anxiety, depression and anger [9]. Academic well-being emphasizes the active role of the student and his / her abilities in creating a vibrant academic environment. Students who are emotionally and cognitively involved with learning spend more time and effort studying and have higher academic well-being, cope appropriately with their educational needs and overcome issues of education [10].

On the other hand, adolescents experience a great deal of anxiety throughout their lives, and sometimes their school life and daily life are disturbed by high levels of anxiety. Exam anxiety is one of these types of anxieties that makes a person unwilling to contact with school. This anxiety may be generalized to social or academic anxiety [11]. Test anxiety is unpleasant emotions in situations where the individual is being evaluated in fact, test anxiety is one of the major obstacles to one's progress and excellence in the school environment, which forces society to bear huge costs [12]. A definition of test anxiety in adolescence is worry of suffering a reduction in one's self image and self-efficacy, particularly its reflection in the eyes of others, concurrently of cognitive processes and outstanding physical and mental discomfort. Test anxiety dispersed in three dimensions namely social derogation, cognitive obstruction and tenseness social derogation refers to the worries of being socially belittled and criticized by noteworthy others after a failure on tests while cognitive obstruction specifies a disturbed concentration, difficulty in recall, troubles in effective problem solving, before or during a stringent test and tenseness refers to the physical and affective discomfort [13]. Test anxiety is not only associated with negative attitudes, but also results in poor educational outcomes and low self-esteem, which is related to one's learning ability, This means, effective measures such as psychological interventions should be used to deal with test anxiety and then prevent academic failure [14]. Anxiety disorders are on the rise among students. However, it is still not possible to make a new classification for exam anxiety and to list the factors

affecting it; Thus, exam anxiety as an important tool is in a state of ambiguity that professionals are always looking for in its prevalence, etiology, classification and confrontation [15]. Students with test anxiety often develop "Mind Rumination", which is associated with emotional disorders and physiological arousal [16]. Although researchers believe that the main cause of test anxiety in students is diverse, they find it beneficial to use psychological services to reduce test anxiety. However, the weakness in the etiology of test anxiety and the inconsistency in the effectiveness of therapeutic practices of test anxiety have led researchers to encounter various ambiguities [17].

Due to the high prevalence of test anxiety and its negative effects on academic performance, researchers have used several therapeutic approaches to reduce it. Among the used methods, regular desensitization and relaxation techniques can be mentioned [18]. One of the interventions that can modulate test anxiety and negative attitudes to school is mindfulness training [3] which involves deep thinking and automatic reflection on current events [19]. Mindfulness can be expressed as the automatic ability of attention and its driving force towards a specific purpose and experience [20, 21, 22] In fact, consciousness is a type of meditation that historically goes back to the ancient traditions of the Eastern religions, and especially to Buddhism. Kabat-zin defines mindfulness as purposeful in a specific way and in the present, without any prejudice or predetermined judgment [23]. Researchers have identified mindfulness as one of the most important prerequisites for cognitive therapy and emphasize its three essential components, including focusing on the present, impeding judgment, and targeted awareness. Practicing consistency on mindfulness techniques creates awareness of daily activity. The person is aware of the functions of the mind and the mastery of automatic intrusive thoughts about the past and the future by these techniques and releases the mind from their control. Having a mindfulness skill helps people focus on the present to avoid unpleasant events. This is because most mental problems stem from the mind's focus on past and future events [24]. Previous research has shown that test anxiety and lack of academic well-being are at the root of many problems during one's academic life that can affect a person's lateral functioning in their daily lives. Therefore, it is necessary to investigate the effectiveness of mindfulness training on improving the above variables. However, useful research has been done in the area of mindfulness and its effect on test anxiety and academic well-being [25, 26 ,27] And they pointed to the role of mindfulness training on reducing anxiety in academic settings and, based on overseas research, it can also be concluded that there are some relatively valid findings on the effect of mindfulness on test anxiety. Focusing on psychological constructs can be useful in the prevention and treatment of hypertension which is a physical consequence of anxiety [28]. Kochuchakkalackal and Reyes showed the effectiveness of Cognitive Restructuring Intervention Program "on the psychological well-being of adolescents [29]. Meta-

cognitive interventions are effective in reducing test anxiety in female students [30]. Mental care may also reduce anxiety, promote social skills, and improve the educational performance of adolescents with learning disabilities [31]. The cognitive approach, combined with relaxation techniques and combined interventions, reduces test anxiety and enhances students' performance [32]. Mindfulness and meditation training are effective on exam anxiety [33]. According to the above mentioned content, the purpose of this study was to investigate the effect of mindfulness on academic well-being and test anxiety of secondary school girls. Researchers have found that mindfulness had a positive effect on educational components [34].

Studies have shown [35, 36] that mindfulness education is also an important factor in enhancing students' view of the school, teachers and peers. Also, they have found that students who were trained in this way were better able to adapt to the environment and peers than their classmates. Research has confirmed that the components of mindfulness are essential to building a positive attitude towards school. Measures to increase mindfulness can enhance the sense of belonging and participation in the school environment. However, one cannot yet emphasize the decisive contribution of cognitive training in building school partnerships and subsequently a positive attitude to school environments [3]. Some have researchers emphasized the role of mindfulness in creating a positive attitude towards school and have provided credible reasons for the role of mindfulness in increasing school enthusiasm and motivation for academic success.

Method

This study was semi-experimental with a pre-test, post-test and follow-up design. The statistical population of the study consisted of all female secondary school students in Shiraz. The total number of these students in the four educational districts of Shiraz was 20,600 who were educated in the year 1397-1398. In this study, multi-stage cluster random sampling was used to select the sample. At First, out of the four educational districts, three was randomly selected, then one high school was randomly selected and five classes were randomly selected from among the existing classes and 120 people responded to test anxiety and academic well-being. From the 120 students, 40 students were purposefully selected and randomly assigned to two experimental (mindfulness) and control groups, (each containing 20 individuals). The experimental group received mindfulness training for a period of 10 sessions, each lasting for 45 minutes. It should be noted that the students participating in this study were in the age range of 16-17 years old. In order for students to participate in the research, the entrance criteria included: students who had a standard deviation below the mean in the psychological well-being test and a standard deviation above the mean in the test anxiety test, no use of psychiatric drugs, students studying in the school year, and not receiving any other training before and during the mindfulness intervention. Also the exclusion criteria included: missing more than one session in mindfulness training sessions, failure to respond to

questionnaires, and participants' unwillingness to continue training sessions. Data analysis was conducted using MANCOVA and ANCOVA's single-variable analysis method and using SPSS software.

The tools used in this study were as follows:

Test Anxiety Scale: The Test Anxiety Scale was developed by Friedman & Bendas-Jacob [37]. It has 23 questions designed to measure test anxiety dimensions (cognitive error, social humiliation, and stress). Scoring on this scale is a triple Likert scale (the lowest score is 0 and the highest is 3). In the Baezzat et al.'s, research [37], the validity of the above test was used by construct validity and factor analysis. After entering 23 items in factor analysis test, results showed that all items had a dependency above 0.3. Cronbach's alpha was used to assess the reliability of the questionnaire (social humiliation 0.90, cognitive error was 0.85, stress 0.83, total 0.91) [13]. The reliability coefficient of this questionnaire was calculated through Cronbach's alpha for social humiliation, cognitive error, stress and total test scales in the present study and were 0.86, 0.83, 0.80, 0.87 respectively, indicating high internal consistency between questions and reliability anxiety test tool.

Academic Well-Being Scale: Tuominen-Soini et al. [4], validated this scale through confirmatory factor analysis and confirmed its four constructs. The Cronbach's alpha value of the questionnaire for the four dimensions of school value, school burnout, academic satisfaction, and engagement with school performance were 0.064, 0.77, 0.91, and 0.94, respectively [38]. This questionnaire has two types of scoring which are 7-point Likert scale (lowest score is 1 and highest score is 7) and 5-point Likert scale (lowest score is 1 and highest score is 5). In Iran, the researchers used exploratory and confirmatory statistical methods to determine the factor validity of this questionnaire and Cronbach's alpha coefficient to investigate internal consistency. Fit indices of confirmatory factor analysis confirmed four factors in this questionnaire. The Cronbach's alpha coefficient of the whole questionnaire, 0.87 school value factor 0.88, school burnout factor 0.73, academic satisfaction factor 0.73, and schoolwork involvement factor 0.75 have been obtained. Also, in order to investigate the divergent validity of the questionnaire, the correlation between the scale score and its extracted factors with the overall academic stress score was calculated which indicates the validity of the academic well-being scale. The range of coefficients obtained in the whole sample was from 0.61 to 0.86 to which indicates good scale validity. [4]. The reliability coefficients for total score and dimensions of school value, burnout, school satisfaction, and school performance were 0.89, 0.78, 0.85, 0.81, 0.87 respectively.

Results

Table 1 shows the mean differences in pre-test, post-test of test anxiety and academic well-being. After the implementation of mindfulness, scores on the posttest of the experimental group improved (Table1). Significance of mean difference in pre-test and post-test was analyzed using multivariate analysis of covariance (MANCOVA). The assumptions of the covariance analysis test were

examined at first. To test the homogeneity of variances, Levin's test of equality of variances was used. Levine's test was in test anxiety ($F=2.80$) and in academic well-being ($F=3.2$). The experimental and control groups were homogeneous in error of variances before the intervention (pre-test). Kolmogorov-Smirnoff test results confirmed the normality of the dependent variable distribution. The results of group F^* pre-test anxiety test showed that the slopes of pre-test, post-test regression in the experimental group and the control group were not significant ($F=1.68$). The results of group F^* academic well-being pre-test showed no significant difference between pre-test, post-test in experimental and control groups ($F=1.58$). Therefore, the interaction of regression slopes of test anxiety and academic well-being variables with the group were not significant

and the assumption of the homogeneity of regression slopes was confirmed. In this study, pre-test of test anxiety and academic well-being were considered as covariates. The Pearson correlation coefficients between test anxiety and academic well-being were 0.16. It can be said that the assumption of multiple nonlinearity between covariates (covariates) was confirmed. As shown in Table 2, statistical tests of multivariate analysis of covariance (Mankova) in training and control groups showed that these groups were significantly different in at least one of the dependent variables (Table 3), the F ratio of single-variable analysis of covariance for the test anxiety variable ($F=46.24$), academic well-being ($F=29.83$) were obtained. These findings indicate that there is a significant difference in the dependent variables (test anxiety, academic well-being) between the intervention group and the control (Table 3).

Table 1. Statistical characteristics of anxiety and academic well-being in pre-test and post-test

dependent variable	group	Pre-test		Post-test		Follow up-test	
		M	S	M	S	M	S
Test Anxiety	Experimental group	42.41	3.65	24.34	5.50	22.70	8.01
	Control group	37.70	4.20	36.65	3.18	36.42	3.20
Academic Well-Being	Experimental group	74.22	10.11	94.88	9.15	94.2	11.1
	Control group	73.30	10.96	71.85	8.19	71.30	8.70

Note: There was a significant difference between the control and experimental groups' mean

Table 2. Multivariate covariance analysis of the impact of mindfulness on test anxiety and academic well-being

Tests	Value	F	f	df Error	p
Pillais Trace	0.80	49.37	2	24	0.0001
Wilks Lambda	0.20	49.37	2	24	0.0001
Hotelling's Trace	4.10	49.37	2	24	0.0001
Roy's Largest Root	4.10	49.37	2	24	0.0001

Table 3. Single-variable analysis of covariance for test anxiety and academic well-being

Source of variable	SS	df	MS	F	p	Eta
Anxiety Test	950.12	1	950.12	46.24	0.0001	0.63
Academic Well-being	2307.44	1	2307.44	29.83	0.0001	0.55

In order to test homogeneity of variances, the Levin's test of equality of variances was used. Levin test was in test anxiety ($F=3.2$) and in academic well-being ($F=2.80$). The Kolmogorov-Smirnoff test results confirmed the normality of the dependent variable distribution (in exam anxiety ($Z=0.98$) and in academic well-being ($Z=0.75$). The results of group F^* pre-test anxiety test showed that the slopes of pre-test regression, follow-up in experimental group and control group were not significant ($F=0.773$). The results of group F^* academic well-being pre-test showed no significant differences between pre-test and follow-up in the experimental and control group ($F=1.64$). Therefore, the interaction of regression slopes of test anxiety and academic well-being with the group is not significant and the assumption of homogeneity of the

regression slopes is confirmed. Pearson correlation coefficients between test anxiety and academic well-being were 0.54. It can be said that the assumption of multiple nonlinearity between covariates is confirmed. As shown in Table 4, statistical tests of multivariate analysis of covariance (Mankova) in the training and control groups showed that these groups were significantly different in at least one of the dependent variables (Table 4). According to Table 5, the F ratio of single-variable analysis of covariance for the test anxiety variable ($F=30.82$) and academic well-being ($F=31.53$) were obtained. These findings indicate that there is a significant difference in the dependent variables (test anxiety, academic well-being) between the intervention groups of mindfulness and control.

Table 4. Multivariate covariance analysis of the impact of mindfulness on test anxiety and academic well-being in the follow-up stage

Tests	Value	F	df	df Error	p
Pillais Trace	0.71	29.18	2	25	0.0001
Wilks Lambda	0.30	29.18	2	25	0.0001
Hotelling's Trace	2.34	29.18	2	25	0.0001
Roy's Largest Root	2.34	29.18	2	25	0.0001

Table 5. Single-variable analysis of covariance for test anxiety and academic well-being in follow-up stage

Source of Variable	SS	df	MS	F	p	Eta
Anxiety Test	1141.33	1	1141.33	30.81	0.0001	0.55
Academic Well-being	2400.73	1	2400.73	31.53	0.0001	0.55

Discussion

The purpose of this study was to investigate the effect of mindfulness on exam anxiety and academic well-being in secondary school students. The results of the first hypothesis showed that mindfulness training reduced test anxiety in the experimental group. Therefore, based on the effectiveness of mindfulness training on reducing the first hypothesis of the research, test anxiety was confirmed. These results are consistent with the results of Gregory's study [32] that examined the effect of mindfulness-based techniques training on reducing test anxiety as well as Sep's studies [18]. In explaining these findings, it can be said that mindfulness techniques can be effective in increasing muscle relaxation and reducing mental distress and thus in reducing anxiety and stress [36]. The main mechanism of mindfulness seems to be self-control. This is because repeatedly focusing on a neutral stimulus, such as breathing, creates an appropriate attention environment and prevents mental occupation with threatening thoughts and concerns about performance during the exam and assessment position. These techniques increase one's awareness of current experiences and shift attention to cognitive and cognitive systems and more efficient processing of information reduces anxiety and physiological stress in the individual [40]. Mindfulness training is one of the therapies based on stress reduction and mental therapy in which the mental representation of the objects in life that are out of the immediate control of humans is taught by breathing and thinking. In fact this is a combination of relaxation and mindfulness [36]. Mindfulness training affects the cognitive system and information processing by increasing people's awareness of the present, through techniques such as paying attention to the body and breathing and shifting awareness to the here and now. As in this model it is believed that students with test anxiety are constantly in a very high state of arousal, knowing that their learning is being evaluated [41] is important. Mindfulness reduces rumination and dysfunctional attitudes in individuals. It also alerts people to their redundant thoughts and redirects their thoughts to other aspects of the present, such as breathing, walking with the presence of mind or environmental sounds, thereby raising rumors and concerns [25]. Mindfulness strategies can be used in the classroom to help reduce exam anxiety and increase academic performance. Doing these exercises can help students relax and become more aware of their bodies and moods [42]. In the consciousness of the mind, the individual becomes aware of the mental approach at every moment, and after being aware, learns to move his mind from one style to another. In the consciousness of the mind, the individual becomes aware of the mental approach at every moment, and after being

aware, learns to move his mind from one style to another. Therefore, it can be argued that mindfulness training and focusing on different aspects of consciousness, can reduce negative self-talk, thereby enhances one's self-control and environmental conditions. On the other hand, it can be argued that deep breathing, which is a mindfulness treatment technique, has been able to reduce situational anxiety in students, so it can be expected that mindfulness training will reduce test anxiety in students.

The results of the study in the second hypothesis showed that mindfulness had a positive effect on the academic well-being of secondary school students. This finding is in line with the findings of Beauchem et al. [42] and Larkin et al. [34] who found that mindfulness facilitates personal performance and academic achievement. In explaining this hypothesis, it can be said that mindfulness exercises, by increasing people's awareness of the present moment, through techniques such as paying attention to breathing and the body and shifting consciousness to the here and now can cause changes in one's thinking patterns and attitudes. As Kabbat-Zain [39] defines mindfulness as focusing on particular ways of aiming at the present, without judgment, it leads to the understanding that these are only thoughts and are not necessarily the truths. Also they should not lead to avoidant behavior or negative attitudes. As a result, mindfulness is effective in reducing rumination, and this reduces maladaptive cognitive content and negative affective symptoms, especially dysfunctional attitude symptoms [36]. In the training of mindfulness, a cognitive reconstruction is performed without the instructor being directly involved in the design of the dysfunctional data and attitudes of the subjects [39]. Implementing mindfulness training for students encourages them to feel valued in the school environment. This feeling is associated with increased academic achievement and leads to a positive attitude toward school [43]. Consequently, it can be argued that mindfulness intervention because of the creation of meta-cognitive monitoring and teaching present-day techniques can help students overcome inadequate thoughts processing and negative attitudes. It can be argued that mindfulness interventions because of the creation of meta-cognitive monitoring and teaching present-day techniques can help students overcome inadequate thoughts of and negative attitudes. Therefore, their negative attitude towards school is greatly reduced. Overall, the results confirm that mindfulness training help students understand their emotions, to fully experience them, and to become aware of their mental approaches. In fact, the full experience of emotions and awareness of emotions has led them to change their mental attitude from one style to another in order to reduce or increase the excitement of these situations when they are anxious or in the rush of negative attitudes and thoughts in different situations and confront it.

Conclusion

According to the findings of this research, mindfulness training can lead to reduced test anxiety and increased academic well-being. One of the limitations of this study was the limitation of generalization of research results to the community of boys as the statistical population of this research is composed of high school girl students of second grade in Shiraz. The results of this study cannot be generalized to the gender of boys and other cities. Therefore, in order to reaffirm the interactive relationships of variables, it is suggested that this research be replicated across communities and samples to provide more empirical support. Another limitation of this study was the non-use of other psychological interventions for comparisons. It is suggested that other educational methods be used to reduce test anxiety and increase academic well-being and compare the results of this studies. Finally, considering the effectiveness of mindfulness training on these variables, it is recommended that the program be run in educational settings by psychologists and counselors for students.

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