



Comparing Problem Solving, Mindfulness and Study Skills Trainings in Reducing Test Anxiety and Improving Academic Achievement in Female Students

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ABSTRACT

gold: To compare teaching problem solving and study skills of mindfulness in reducing anxiety and improving academic achievement of university female students of Medical Sciences Shahrekord 2015-2016

Methods: This quasi-experimental study including pre-test and post-test with control group, the study population female 1200 University of Medical Sciences and sampling 180 students were selected through random cluster sampling method. And with anxiety test Spielberger and clinical interviews were troubled 65 then 60 of them with full satisfaction with randomly 3 experimental groups and one control group. Education is one of the three groups (mindfulness, problem solving, learning the correct ways) into an 8 5/1 hour session experienced a fourth group that make up the control group received no intervention. At the end of test anxiety for four runs in the second semester scores of both groups were compared in two semesters.

Results: The results showed that between experimental and control groups, there is a significant difference in the reduction of anxiety. Mindfulness in groups of test anxiety and problem solving methods will often have more study is compared with the correct training. Also in the academic performance test, control group, there were significant differences between experimental groups.

Conclusion: It is concluded that mindfulness techniques Teach correct the problem methods to reduce anxiety in students' academic performance are considered female. It seems that cognitive therapy and learning the correct way to study the effects are more obvious.

Keywords: test anxiety, problem solving techniques, cognitive therapy, training, study skills, academic achievement

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INTRODUCTION

Anxiety is an integral aspect of human life. However, it can also be treated as a double-edged sword of adjustment or underdeveloped compromise of human. Although living without anxiety is not possible and imaginable, a lot of efforts as well as a time and money have always been spent for its treatment (Sadok & Sadvk, 2001; translated by Pour Afkari, 2011). Test anxiety is a type of school anxiety, which is closely related to the performance and student's educational achievement as a common and an important phenomenon. This anxiety is a very important cognitive-emotional variable that a lot of research has been dedicated to it (Hill & Wigfield, 1984). According Test Anxiety Association of America (2010), the incidence of severe test anxiety among high school students is almost 15 to 20 percent. The students are suffering from low performance in the exam, difficulty in understanding educations, and poor performance in other areas (Harrison, 2011). Test anxiety is actually a widespread phenomenon that is associated with impaired performance in school exams and it can be considered as the most common and persistent fear among students (Ganzn Muller 2006; Orbach, Lindsly, and Grey, 2007). Due to fear, anxiety and rumination, anxiety exam is experienced through the potential failure during the test position and fear of negative evaluation is determined in the

field of education (Hall, 2005; Lawson, 2006). Zolmke (2007) considers test anxiety as a particular fear pattern and focused in response to the position of evaluating student's performance. Students with high test anxiety have less willingness to do their homework than students with reduced exam anxiety. They turned their attention to activities unrelated to the task, preoccupation with worry, self-criticism and physical concerns and therefore, have less attention to the task-based efforts; and reduce their performance (Vienna, 1980; quoted by Lawson, 2006). Several studies have examined the effectiveness of interventions and mindfulness-based techniques as well as study skills on test anxiety, which includes the following:

Linden (1973) in a study entitled as "The impact of meditation practice on test anxiety and improved 'reading' in students, came to the conclusion that the conscious mind meditation has a significant effect in reducing anxiety and increasing student's achievement. Ferrando (2005) in a study entitled as "Using mindfulness-based cognitive therapy in reducing anxiety, came to the conclusion that mindfulness-based cognitive therapy has a significant effect in reducing anxiety in students. Paterniti (2007) in a study entitled as "Comparison of the effectiveness of mindfulness-based program with study skills, test anxiety treatment," came to the conclusion that both methods are effective in reducing anxiety, but mindfulness-based cognitive therapy is significantly more effective in reducing anxiety with regard to study skills training. Beauchemin, Hutchins & Peterson (2008) in a study entitled as "The impact of

mindfulness in reducing anxiety, increasing social skills and academic performance on 34 students with test anxiety and learning disabilities for five weeks of mindfulness-based cognitive therapy, came to the conclusion that in addition to improving academic performance and increase social skills, this treatment led to the reduction of anxiety and state-trait anxiety. Kadaie (2006) in a study entitled as "Comparison of the effectiveness of multimodal therapy and study skills training on reducing anxiety in male students," came to the conclusion that both methods are effective in reducing anxiety and there is no difference between two methods in terms of effectiveness. Sobhi Gharamaleki (2006) in a study entitled as "Evaluation of the effectiveness of cognitive therapy and study skills training in reducing anxiety and increasing academic performance with respect to the personality components" came to the conclusion that both cognitive therapy and study skills training are effective in reducing test anxiety. Haqqani (2007) in a study entitled as "Evaluation of the effectiveness of cognitive and metacognitive strategies on reducing test anxiety of male college students" came to the conclusion that such guidelines will help reduce test anxiety. Altemayer & Woodward (1981) and Mackashi, Pinterich, & Line (1985) have shown that study skills training is an effective in reducing anxiety (quoted from Johnson, 2007). Dodeen (2008) in a study came to the conclusion that use of cognitive therapy alone is not enough for reducing exam stress, but teaching them how to study, is also essential for an increased academic performance and decreased test anxiety. The man is constantly faced with the situations needing problem-solving in order to maintain his adaptation for a level of performance. Lack of appropriate skills for problem solving is related to a number of emotional and behavioral problems in adulthood such as depression and anxiety in (Akbari, Shaghaghie & Behrozian 2011) and test anxiety (Hoffman, 2010). One of the effective ways to reduce test anxiety in students is problem-solving skills training, which is one of the components of social cognition and cognitive-behavioral process and one is trying to detect an effective and adaptive solutions for conditions that cause problems and encounter in everyday life. In this definition, problem solving is considered as a purposeful, active and conscious activity (Nezu & Zurilla 2005). Problem-solving is described as a practical coping skill that leads to increased self-esteem and has a connection with optimal personal adjustment and includes five steps: understanding the self, problem definition, different ways to make a list of solutions, making decisions about the most appropriate solution, and testing selected solutions (Kelinke, 2003). The results of Nezu and Zurilla (2002) have demonstrated the relationship between social anxiety and problem solving, so that orientation is negatively correlated to the worry and anxiety. The result of the study by Olabisi (2014) on high school students showed the effectiveness of problem solving training on test anxiety. Rena (1980) also showed that the cognitive components of test anxiety are affecting more than other concerns of emotional components in dealing of learners with this phenomenon and therefore an intervention such as problem solving skills target the cognitive ability in learners that can help them manage the level of test anxiety. The results of the study by Akbari, Shaghaghie and Berezina (2011) investigating the effect of problem solving training on test anxiety of 40 female students showed that the problem solving training program reduces test anxiety level in the students. The four-month follow-up results of these researchers also showed that the effectiveness of the problem solving training is stable; thus, according to the research conducted and the high prevalence of test anxiety as well as since this anxiety is considered as a major deterrent factor in students' progress and performance imposes huge costs on society, the need to evaluate the effectiveness of psycho-educational interventions

is frequently seen in reducing anxiety. Also since test anxiety stems from an early age and increases during the educational periods, methods used for intervention can also be considered as ways to prevent test anxiety. In this case their studied effectiveness can be considered as an introduction to the application of the techniques and methods of prevention. This study compares the effectiveness of problem-solving training, mindfulness methods and proper techniques of studying in reducing anxiety and improving students' academic achievement in Shahrekord University of Medical Sciences. The results of the study could be applicable to teachers, psychologists and counselors on campus.

Method:

This research was a quasi-experimental study with pretest-posttest control group design. The study population consisted of 1200 female students in Shahrekord University of Medical Sciences. Among them, 180 female students were randomly selected and through Spielberger test anxiety and clinical interviews, 65 female students with severe anxiety were identified. Then, with full satisfaction, 60 students were randomly divided into 3 experimental groups and one control group. Three groups received one of these trainings (mindfulness, problem solving and correct methods of study training) for 8 sessions lasting 1.5 hours and the fourth group that composed the control group, did not receive any training. At the end, a measure of test anxiety was administered for four groups and in the second semester, two semester's scores were compared with each other. At the end of the project, mindfulness skill was taught for the control group for increasing their motivation.

Research Tools:

In this study, Spielberger test anxiety and clinical interview were used for determining test anxiety in students and the average scores of the first and second semester were used to evaluate their academic performance. Spielberger test Anxiety inventory was developed by Eshpel Burgers (1980 quoted from Abolqasemi *et al.* 2004). It consists of 20 items that describe responses before, during and after the test. The questionnaire includes two subscales of anxiety and excitement. Each participant responds to any item on the basis of a four-item Likert scale ranging from very often to never. These options are scored based on the values of 1 to 4. In this questionnaire, a high score indicates high test anxiety in person. It should be noted that, because anxiety and excitement aspects were not the purposes of this study, then; the total score was used to achieve the research objectives. Research on the reliability and validity of the questionnaire was satisfactory. This questionnaire is correlated with test anxiety measure in boys (82.0%) and girls (83.0%) respectively (Sarason, 1986). Also the questionnaire's correlation with the State-Trait Anxiety Inventory has been reported in girls (86.0%) and boys (77.0%), respectively. Cronbach's alpha coefficient of the questionnaire was reported 92.0% both in girls and boys. A test-retest reliability coefficient of the questionnaire was reported 80.0% after three weeks and a month (Register *et al.*, 1991; quoted from Abolqasemi, 2004). In the present study, the reliability of the questionnaire was found 85.0% using Cronbach's alpha.

Summary of Mindfulness-based stress reduction program training sessions:

First session: to communicate, to define and conceptualize, and the use of mindfulness training. Second session: Learn about the relaxation, relaxation training for 14 groups of muscles of the forearm, upper arm, calf muscles, thighs, abdomen, chest, shoulders, neck, lips, eyes, jaw and forehead. Third session: relaxation training for the sixth group of muscles of the hands and arms, legs and thighs, abdomen, chest, neck and shoulders, jaw, forehead and lips and homework relaxation training. Session IV: mindfulness training of breathing: a short review of

the previous session, learn about mindfulness of breathing, breathing exercises training with relaxation and without thinking about something else and watching breathing technique training and mindfulness homework assignment of breathing for 20 minutes before bedtime. Session V: body scanning technique training: technique training for attention to the movement of the body while breathing, focus on the body and move them and search for physical sensations (hearing, taste, etc.), mindfulness homework for eating (eating calmly and according to taste and sight of food). Session VI: thoughts mindfulness training: attention training to the mind, negative and positive thoughts, pleasant and unpleasant thoughts, allowing the entry of negative and positive thoughts in mind and easily remove it from the mind without judgment and strong focus on them and homework for writing daily positive and negative experiences without judging them. Session VII: full Mindfulness: repeating training sessions 4, 5 and 6 each for 20 to 30 minutes. Session VIII: Review and summary of previous sessions and administration of posttest.

Summary of training sessions for study skills:

First session: to communicate, conceptualize, articulate the logic of effective training and time management techniques training and formation of study behavior. Second session: cognitive strategies training including repetition and review, semantic

and organizational development. Third session: metacognitive strategies training, including planning, monitoring and evaluation, and regulation. Session IV: Education and study strategies training, particularly for summary and review. Session V: A brief training in how to read, skim and read words. Session VI: careful reading methods training and thoughtful reading. Session VII: critical reading strategies training and reading to appreciate the beauty and artistic aspects of the story. Session VIII: Review and summary of previous sessions and administration of posttest.

Summary of problem-solving skills training sessions.

Summary content of the intervention sessions was as follows: Session I: (overall position detection) (first phase). Second session (strengthen the first step, i.e overall position detection). Third session: (accurate definition of the problem) (the second stage). Fourth session (a list of different solutions (brainstorming) (the third stage). Session Five: (evaluated proposed solutions and choosing the best solution) (Step Four). Session VI: (decision-making and implementation of the selected solution) (fifth stage). Session VII: (proof) (phase VI). Session VIII: (review before and questionnaires distribution) (assessment of past sessions).

Findings:

Table 1. Summary of the descriptive findings pre and post test scores in both groups by Spielberger test

Groups	number	mean	Standard deviation	mean	Standard deviation
Mindfulness	15	63.60	8.39	47.89	9.47
Study skills	15	61.29	5.26	52.82	4.52
Problem-solving skills	15	40.60	20.7	59.43	98.4
Control	15	61.60	2.63	63.12	3.82

Table 2. One-way analysis of variance to test before and after the test scores in both groups by Spielberger test

Statistical indicators for Sources of changes	Sum of squares	Degrees of freedom	Mean sum of squares	F	Significance level
Variance between groups	2024.67	3	674.22	21.73	0.0005
Variance within groups	1016.7	36	28.16		
The total variance	3041.37	39			

The results in Table 2 indicated that there are significant difference between the experimental and control groups in terms of student's test anxiety ($P < 0.005/0$, $F(36, 3) = 21.73$. For careful examination of means that are different from each other, Tukey test was administered. Tukey's test results showed that test anxiety in mindfulness, problem-solving and study skills training groups have decreased significantly compared to the control group. To control pre-test and careful investigation

of independent variable impact on the experimental and control groups, analysis of covariance was used. Preliminary analysis to evaluate the homogeneity among gradients represented that the interaction between variables and factor is not significant, $F(3, 32)=0.639$, $P=0.589$, $MSE=15$. Since the homogeneity of variances and gradients in the study groups was not significant, covariance analysis is followed with the assumption of homogeneity of gradients.

Table 3. Summary of analysis of variance results to compare test anxiety

Source of change	Mean Square	Degrees of freedom	F	Significance level	ETA squares
Covariable	543.94	1	23.74	0.0005	0.404
Main effect	683.25	3	29.82	0.0005	0.719
Error	22.9	35			

After removing the effect of pre-test, the cognitive therapy experimental group had the highest adjusted average $M = 47/35$ and $SD = 56/1$ compared with problem solving group $M = 43/95$, $SD = 1/56$ and study skills group $M = 52/8$, $SD = 1/55$. The results of ANOVA in studied groups in the first and second semesters showed that there is no significant difference between the first semester GPA (pre-test) and studied groups $P = / 275$, but after the treatment, a significant difference was observed in the second semester GPA (post-test) in both experimental and control groups in terms of academic performance. As a consequence, cognitive therapy, problem solving and study skills methods enhance academic performance.

Discussion

The aim of the present study was to compare the effects of mindfulness-based stress reduction program and study skills in reducing test anxiety. The results showed that there are significant differences between the experimental and control groups, so that both mindfulness-based stress reduction program and study skills were effective in reducing test anxiety. There was also no significant difference between the two groups, in that; mindfulness-based stress reduction program was more effective in reducing test anxiety of students than study skills. So, the hypothesis was confirmed. Below, we discuss the findings and hypotheses and conclusions. The first finding of the study on the impact of mindfulness-based stress reduction program in reducing anxiety among female students of Shahrekord university of medical sciences is consistent with the findings by Ferrando (2005), Paterniti (2007), and Beauchemine et al (2008). Mindfulness techniques are effective in increasing muscle relaxation and reducing anxiety and consequently they reduce anxiety and stress (Kabat Zinn, 2003). It seems that the main mechanism of mindfulness and self-control is attention, because repeatedly focused attention on a neutral stimulus such as breathing, creates a proper attention condition and avoids threatening preoccupation with thoughts and concerns about performance during test and evaluation positions (Semple et al., 2005). Preliminary information indicates that the mindfulness practice may be a viable alternative to conventional psychological therapies in the field of anxiety disorders, especially for those who do not want to attend meetings of the traditional treatment or those who do not respond to treatment (Miller, Fletcher and Kabat-Zinn, 1995). Meta-analysis has been undertaken to support the idea that mindfulness-based stress reduction program alleviates the symptoms of stress and anxiety and increases well-being in clinical and non-clinical samples (Bauer, 2003; Grossman et al., 2004; Chang, et al., 2004; Shapiro et al., 2005). Insight and skills are learned through the mindfulness practices and then are used to deal with stressors and complaints that people often bring (Kabat-Zinn Santorelli et al., 2002). Since mindfulness-based stress reduction program enhances both physical and mental performance, it can be expected that mindfulness-based stress reduction program participants have a more positive attitude towards their abilities and act successfully in coping with anxiety and worry (Kabat Zinn, 1990; Chung et al., 2004). By encouraging people to frequent practice for attention on neutral stimuli and purposeful awareness of the body and mind, the mindfulness training relieves people with anxiety and obsession from threatening and worrying thoughts about the exam and makes their minds off the automatic mode. In other words, by increasing awareness of the current experiences and turning the attention on cognitive systems and more efficient information processing, this method can reduce the fear, physiological arousal, and test anxiety (Kabat-Zinn, 1990; Kristellr, 2007). The second finding of the study regarding the

impact of study skills on reducing anxiety in university students is consistent with the findings by Kadaie (2006), Sobhi Gharamaleki (2006), Haqqani (2007), Altmaier & Woodward (1981), Mackashie et al., Dodeen (2008). In skills training, it is assumed that test anxiety in students is due to lack of study skills and test-taking skills. In order to compensate for this deficiency, training deals with either or both of them. According to the defect models, skills training is based on the assumption that students with test anxiety have less or weaker reading skills, and lower abilities and try ineffectively to get involved in taking exam. In these models, students' inability to properly study and test-taking, makes interfere with the performance, not thoughts unrelated to the task and test (Johnson, 2007). People who suffer from high levels of test anxiety, are vulnerable to reactions unrelated to their assignments or poor study habits and skills. During exams, students may have trouble in understanding the problem. They may read the questions wrong and may also be unable to organize your thoughts. Students with a high level of test anxiety are more likely to opt for strategies to prepare for the exam. They need less cognitive thinking, such as surface processing or repetitive practices in order to memorize the contents, their studying time for the exam is increased (Cassidy, 2004) and therefore, good study skills training can eliminate this defect in students, and result in decreased test anxiety. The third research finding concerning the effectiveness of mindfulness-based stress reduction program on the study skills in reducing anxiety in female students of Medical Sciences is consistent with the findings of Petreninie (2007), and Dodeen (2008). Ergene (2003) found out although cognitive and behavioral approaches alone are effective in reducing anxiety, the study skills alone have little success. Consistent research have shown that study skills training has moderate to little effect in reducing anxiety, unless they are combined with cognitive and behavioral techniques and relaxation, which in each of these cases, a significant decrease test anxiety is likely (Sharma, 2002; Oregon, 2003). The results will improve significantly when the skills training is combined with systematic desensitization (Brown, 1999; Oregon, 2003). Study skills training only leads to improved inaccurate methods and in this way partly help reduce test anxiety. While in the addition to control anxiety, mindfulness makes a person to study with full awareness and presence of mind and all of his mental aspects are involved in the study materials. This leads to the semantic development and better organizing of lessons. In addition, it helps person to organize a more coherent understanding of the subject leading to better recovery information. Interventions are the best treatments for test anxiety, which account for components such as mental training on test anxiety, attention control, relaxation, and self-control. Mindfulness program is one of these interventions that includes all the components (Paterniti, 2007). In mindfulness method, mental and physical dimensions are considered simultaneously to control and manage emotions, and it is taught people to be aware and full presence of mind regarding their thoughts and feelings, and accept them without judgment and look at them with a broader view. When a person is placed in a state of relaxation and concentration in addition to the full knowledge of his thoughts and feelings and accepts them without judgment, he acquires the ability to control his thoughts, anxiety and emotions. These abilities make a person feel more in control of all of his life and instead of giving negative automatic responses in situations of anxiety and stress, be able to better control and cope with problems calmly and with greater awareness (Kabat-Zinn 1990). Fourth research finding about the effect of problem solving training in reducing test anxiety of female students of Medical Sciences is in line with the findings by Tahir, Noroozie and Taghizadeh(2014), who came to the conclusion that problem-solving skills are a short term,

efficient and harmless strategic that can empower them against anxiety by targeting student's cognitive abilities. The finding is also in line with the results of many previous studies that demonstrated problem-solving training is effective on reducing student's test anxiety (Algeaz, 2014, Akbari, 2011, Menucha, 2007, Hoffman, 2010 Verana, 1980). Based on research by Akbari, Shaqqaqi and Behrozian (2011), it can be said that students who suffer from test anxiety are so concerned with avoiding defeat that they cannot focus on solving problems. In fact, the anxiety and fear of failure interfere with the students' performance and fail the student to test their abilities and will result in poor performance; however, these issues are unmanageable and catastrophic. Besides problem solving training encourages students to select different and favorite techniques for their problem-solving (Algeaz, 2014). The fifth study in relation to the higher effectiveness of stress reduction program based on problem-solving to study skills showed that problem-solving skill is more effective than study skills training. So, as a cognitive-behavioral strategy, problem solving skill is emphasized both in cognitive and behavioral aspects and acts as a shield against negative events (Seoul, et al., 2013). Teamwork problem solving training strengthens cognitive skills such as observing, comparing, organizing information, determining control variables, formulating hypotheses, analysis, inference, evaluation and judgment and the student learns to make a definite decision instead of taking impulsive and avoidant decisions, and identify his strengths and weaknesses with frequent examination and tries the other ways in the event of encountering with obstacles (Fang Howe, 2012). The sixth research finding on the higher effectiveness of mindfulness-based stress reduction program than problem solving showed that mindfulness skill is more effective than problem solving. Many methods have been used in various studies to reduce test anxiety. In this research, the cognitive approach is more effective than behavioral approach for the treatment of test anxiety. In addition, mindfulness approach is an effective treatment for test anxiety such as psychological training on test anxiety, attention control, relaxation, and self-control. Mindfulness approach is one of such interventions that include all the components (Paterniti, 2007).

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