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The effectiveness of group training of cognitive behavioral therapy-based stress management on anxiety, hardiness and self-efficacy in female medical students

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Abstract:

INTRODUCTION: The present study aimed to investigate the effectiveness of cognitive behavioral therapies (CBTs) for anxiety, hardiness, and self-efficacy in female students of Birjand University of Medical Sciences.

MATERIALS AND METHODS: This was an interventional study. A sample of 30 participants were selected through the available sampling method and randomly assigned into experimental (CBT) and control groups (each group, 15 female student). The data collection instrument was the Beck Depression Inventory questionnaire. The questionnaires of Beck Anxiety Inventory, Ahvaz Hardiness Inventory, and Schwartz's General Self-Efficacy Scale were completed by all participants in two stages (pretest and posttest). A 6-session protocol of cognitive behavioral group therapy was performed only on the experimental group. The data were analyzed using Kolmogorov–Smirnov, Levene's F, Mbox, analysis of variance, and multivariate analysis of variance tests.

RESULTS: The intervention group showed that the mean of anxiety decreased, whereas ($P < 0.001$) the means of hardiness and self-efficacy increased in the posttest for the experimental group ($P < 0.001$).

CONCLUSION: Based on the obtained results, it can be concluded that CBT is an effective treatment for anxiety, hardiness, and self-efficacy. Therefore, through managing anxiety, the levels of hardiness and self-efficacy can be increased in students of university to be able to cope with the different challenges in their life.

Keywords:

Anxiety, cognitive behavioral therapy, hardiness, self-efficacy

Introduction

Anxiety is a general term for several disorders that cause nervousness, fear, apprehension, and worrying.^[1] The World Health Organization has estimated that anxiety disorder is on the top of the list of mental illnesses and accounts for about 25% of the referrals to the health centers in the world. Although anxiety exists in every person's life, it seems to be more intense

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in students' lives. In recent years, more attention has been given to health problems, especially student mental health.

This is because the obtained results of the previous research indicated that the numbers of students of the university who suffer from mental problems are increasing.^[2] Based on the studies in this regard, emotional states and their expressions vary in different cultures.^[3-5] The results also indicated a significant relationship between academic

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achievement, anxiety, and depression.^[6,7] Furthermore, the results of some other studies showed that academic probation students of the university had significantly more symptoms of obsessive-compulsive disorder, depression, hostility, anxiety, phobia, psychosis, and eating disorders,^[8] compared to other students of the university.^[6] Issues such as anxiety, depression, disturbances between students of the university and their parents and poor communication between them can have a negative impact on a large number of coping factors such as personal and educational adjustment, mental health, and social support.^[9]

One of the factors that have been given less attention in relation to anxiety is psychological hardiness.^[10] Kobasa^[11] has suggested this concept as a confirmatory factor against the stressful life events, especially the occurrence of a variety of physical illnesses. Psychological hardiness includes three basic components, namely, mastery (the ability to dominate the diversity of life situations), commitment (desire to engage, rather than getting away from doing something), and challenge (the ability to understand that change in life is something natural.^[12] The greater the feelings of an individual's control over the stressful and distressing events and the greater the resistance and hardiness of him/her, the lower the anxiety.

The results of some studies indicated that psychological hardiness decreases the stress factor of events, as well as the psychological arousal resulting from these events and increases self-efficacy and has a positive effect on the health of individuals.^[8] Previous researches have proven that students of the university with more anxiety had lower hardiness and self-efficacy.^[13,14] Self-efficacy beliefs are the main pillar of human motivation so that the level of enjoying these beliefs determines the probability of success in doing things.^[15] In the education field, academic self-efficacy is believed to be the student's belief in the ability to achieve a certain level of homework.^[16] Low self-efficacy in students of university leads to refusal to do educational assignments in line with the objectives of the education system. This leads to failure in academic affairs and increased anxiety.^[17] Individuals with higher self-efficacy enjoy a desirable level of emotional information for psychological and social adaptation, lower level of stress and higher hardiness,^[18] and better performance in controlling the difficult situations in life.

For treating emotional problems such as depression, anxiety disorders, and different therapeutic techniques have been developed including drug therapy, and nondrug therapy such as psychotherapy, mindfulness cognitive therapy (CT), cognitive behavioral therapy (CBT), and dialectical behavior therapy.^[19]

CBT is a type of psychotherapy that helps the student to dissect the relationships among their emotions, cognitions, and behaviors to identify and reframe irrational and self-defeating thoughts, which in turn improves their mood and alters their behaviors.^[20] Research and clinical practice have shown CBT to be effective in reducing symptoms and relapse rates in a wide variety of psychiatric disorders.^[21]

Studies on Iranian medical students revealed a frequency of mental disorders between 31% and 51.8%.^[22] Although, there are a few studies on the mental health situation of medical students in the internship period, there is not enough evidence to be generalizable to all medical students. We need more studies to make more valid and reliable evidence for policymakers.

Apparently, there are differences between men and women in terms of hardiness. The results of some studies showed that men are more tenacious than women, and tenacity in women, unlike men, does not prevent the negative effects of stress. However, Shepperd and Kashani^[23] rejected such findings. The purpose of this study was to evaluate the effectiveness of group training of CBT-based stress management on anxiety, hardiness, and self-efficacy in female students of Birjand University of Medical Sciences.

Materials and Methods

The present study, in terms of purpose and method, is quasi-experimental research with pretest and posttest control group design. The statistical population of the study included all dormitory in female medical students of Birjand University of Medical Sciences which among them, 30 students of the university were selected by the available sampling method and assigned into the two experimental ($n = 15$) and control ($n = 15$) groups.

Inclusion criteria: (1) having the Beck depression score higher than 16; (2) living in the dormitory; (3) being informed and satisfaction. Exclusion criteria: (1) unsatisfied students; (2) the graduate ones; (3) those who did not live in the dormitory; (4) having the Beck depression score lower than 16. The data were using the mean and standard deviation at the descriptive level and the Kolmogorov-Smirnov, Levene's F, Mbox, analysis of variance (ANOVA), and multivariate ANOVA (MANOVA) tests at the inferential level.

Data analysis

For statistical analysis, results were presented as Pearson correlation for quantitative variables. All statistical analysis was performed using SPSS software (version 19.0, SPSS Inc., Chicago, Illinois, USA). Statistical significance was determined as a $P \leq 0.01$.

Measures

In this study, two scales were used to measure the variables Schwarzer's General Self-Efficacy Scale (GSE) and Beck Anxiety Inventory and Ahvaz Hardiness Inventory (AHI).

Schwarzer's GSE scale was created in 1979 by Schwarzer and Jerusalem.^[24] The initial scale had 20 items with two subscales of general self-efficacy and social self-efficacy, which in 1981 became a single-factor scale with 10 four-choice items called GSE-10. The minimum and maximum scores on this scale are 10 and 40. This scale has been translated into many languages of the world. The reported alpha coefficient for this scale is 0.88 in Canada, 0.81 in Costa Rica, 0.91 in Japan, 0.85 in Korea, 0.79 in Indonesia, and 0.75 in India.^[25] In this research, the Cronbach's alpha coefficient of 0.80 showed the optimal reliability of this scale.

Evaluation of anxiety symptoms is very important in diagnosis and treatment. So far, many scales have been made according to different perspectives. The questionnaire is a 21-item scale in which the subject chooses one of the four options that indicate the severity of his/her anxiety. Four options for each question are scored in a four-part range from 0 to 3. Each test item describes one of the common symptoms of anxiety (mental, physical, and panic). Therefore, the total score of the questionnaire is in the range from 0 to 63.^[26] In an analysis of psychometric properties of this test among the Iranian population, the validity coefficient was 0.72 and the reliability coefficient of test-retest with 1-month interval was 0.83. According to studies conducted in Iran, >35% of students suffer from moderate and severe anxiety, which is higher than other countries.^[27] In this study, the Cronbach's alpha coefficient of 0.83 represents the optimal reliability of this scale.

AHI scale which was created and validated by Kiamarthy has 27 items.^[28] Each item has four options that include never, rarely, sometimes, and often, and score 0, 1, 2, and 3, respectively. Using a test-retest method, the reliability coefficient of this scale was reported to be 0.84.^[29] The Cronbach's alpha coefficient of 0.82 represents the optimal reliability of this scale for this study.

Treatment protocol

The student of university in the experimental group (CBT) was given skills in six 90-min sessions. The content of the CBT training courses is, respectively, listed in Table 1. During this time, the control group did not receive any training and was on the waiting list. 1 week after intervention training, all individuals in the experimental and control groups completed the inventories. The therapists in this study have master's degree level

Table 1: The number and content of the sessions

Session	Content of the sessions
1	Awareness of stress and its coping ways: Self-awareness
2	Do not be indifferent to stress: Mental methods
3	Adapt to life: Physical methods of coping with stress
4	Study skills, exam preparation and time management
5	Group power: Interpersonal relations skills
6	Treat yourself to merit: Cultivate self-esteem and honor, prevent depression and anxiety, and deal effectively with them

education in psychology and have all specialized expertise in the cognitive-behavioral therapies.

Consent to participate

All patients signed the informed consent form to participate in the study, following all the necessary ethical recommendations inherent to a project developed with humans.

Intervention

The content of the training sessions as follows:

First session: Administering the pre-test, explaining stress-causing factors and the importance of stress management, how to respond to stress-causing factors, creating a list of such factors, and relaxation practice

Second session: Getting aware of spontaneous thoughts, understanding the relationship between thoughts and feelings, understanding the physical symptoms, relaxation practice along with diaphragmatic breathing

Third session: Explaining the relationship between thoughts and excitements, identifying negative thoughts and understanding their effects on behavior, imagination and relaxation practice

Fourth session: Awareness of reasonable and unreasonable self-talks, relaxation practice in the form of imagination along with diaphragmatic breathing

Fifth session: Replacing reasonable thoughts, autogenetic training of heaviness and warmth feeling (sunlight meditation practice), relaxation practices in the form of mental imagination along with positive self-induction

Sixth session: Training efficient dealing, autogenic training of heartbeat, breath, stomach, and forehead

Seventh session: Administering responses of efficient dealing, autogenic training along with imagination and self-induction

Eighth session: Training anger management and mantra meditation

Ninth session: Training assertiveness, breath count meditation

Tenth session: Social support, a total review of the program, and creating a personal stress management plan.

Results

The mean age of study participants in this study was 22 years (range 20–24 years) and all were Single. Meanwhile, the both groups were matched in the age variable. Standard deviation for experimental and control groups 1.13.

The mean and standard deviation of the main variables of the study are presented in Table 2 for the experimental and control groups. As can be seen, for the experimental group in the posttest, the mean of anxiety decreased, whereas the mean of hardiness and self-efficacy increased.

The Kolmogorov–Smirnov test was used to evaluate the assumption of normality of the variables. The results of this test show that according to the significance level, all variables follow the assumption of normality ($P > 0.05$).

The assumption of the homogeneity of regression slopes means that the regression coefficient of the dependent variable has the same coefficient of the covariance

Table 2: The mean and standard deviation of the main variables of the study for the experimental and control groups

Variable	Group	Measure stage	Mean	SD
Anxiety	Experimental	Pretest	13.40	6.16
		Posttest	4.86	4.15
	Control	Pretest	13.46	5.16
		Posttest	13.93	4.60
Hardiness	Experimental	Pretest	168.27	14.31
		Posttest	175.80	6.00
	Control	Pretest	167.27	5.16
		Posttest	167.80	13.06
Self-efficacy	Experimental	Pretest	30.60	9.08
		Posttest	39.20	7.92
	Control	Pretest	29.53	8.37
		Posttest	29.26	8.38

SD=Standard deviation

Table 3: The results of analysis of variance F-test

Variable	SI	Sum of squares	df	F	Significant
Anxiety	Interaction between group and pretest	5.66	1	2.16	0.15
Hardiness		0.41	1	0.11	0.74
Self-efficacy		8.95	1	1.98	0.17

SI=Statistical index

Table 4: The results of multivariate analysis of covariance of posttest scores in the experimental and control groups

Statistical index	Test type	Value	F	Hypothesis df	Error df	Significant
The difference between two groups by controlling the pretest effect	Pillai's trace	0.70	18.38	3.00	23.000	0.001
	Wilks' lambada	0.29	18.38	3.00	23.000	0.001
	Hotelling's trace	2.39	18.38	3.00	23.000	0.001
	Roy's largest root	2.39	18.38	3.00	23.000	0.001

variables in the groups. To test this assumption for each of the variables, analysis of variance (ANOVA) F-test was used. In according to obtained results [Table 3], the regression coefficient, F, that calculated for group interaction and the pretest are not statistically significant ($P > 0.05$). As a result, there is no significant difference between the coefficients and hence the assumption of homogeneity of regression coefficients is confirmed.

Analysis of the assumptions

Data analysis for MANOVA shows that the assumptions of independence, normality, homogeneity of variances, homogeneity of variance-covariance matrix, and homogeneity of regression slope for performing parametric tests are established. Regarding the assumptions made in our study, it can be concluded that the data of this research have the ability to enter the multivariate covariance analysis; therefore, we can investigate the differences between the dependent variables of two groups. The results of multivariate analysis of covariance (MANCOVA) of posttest scores in the experimental and control groups are summarized in Table 4. As can be seen, there is a significant effect for the CT (independent variable) after the elimination of the pretest impact. Therefore there is a significant difference between at least one of the dependent variables in the experimental group with the control group (Wilks' lambda = 18.38, $P < 0.001$).

To evaluate the effect of independent variable on dependent variables, the results of one-way covariance analysis in MANCOVA context are listed in Table 5, whereas the effect size is equal to the effect of the independent variable on the dependent variable and the power of test indicates the adequacy of the sample size. It is worth noting that the significance level achieved for research variables is smaller than the significance level of 0.016 obtained from Bonferroni correction for multivariate covariance analysis (dividing the significance level of 0.05 by three dependent variables). Based on the obtained means, it can be concluded that CT is effective on the level of anxiety, hardiness, and self-efficacy of students; therefore, the research hypothesis is confirmed.

Discussion

The current results demonstrated that there was a significant difference on anxiety, hardiness, and

Table 5: The results of one-way covariance analysis in multivariate analysis of variance context

Variables	Source of variation	Sum of squares	df	F	Significant	Effect size	Power of test
Anxiety	Between-group	624.51	1	59.77	0.001	0.70	1.00
Hardiness		430.07	1	9.09	0.006	0.26	0.82
Self-efficacy		661.31	1	12.71	0.001	0.33	0.92

self-efficacy between the two groups. The findings showed that CBTs have an effect on anxiety, hardiness, and self-efficacy. It seems that the psychological interventions were effective and could increase the hardiness and self-efficacy of participants. In other words, when participants have high level of stress management they could tolerate the stress of life.

The results of the present study also indicated that the students' psychological hardiness increased remarkably after the educational intervention, i.e. group training of stress management resulted in an increase in psychological hardiness. This finding is in agreement with those of the studies conducted by Sahranavard *et al.*,^[30] Jameson^[31] and Shaghayeghi,^[32] Maddineshat *et al.*,^[33] A study by Aghel Masjedi *et al.*^[34] found the use of an educational offering to be effective in increasing hardiness levels. Further, using a longitudinal approach, Hemmati Sabet *et al.*^[35] and Dehghanizade *et al.*^[36] reported sustained increased hardiness over 6–24 months following periodic training sessions.

Hardiness was found to be negatively related to global stress, which is consistent with previous research linking hardiness to perceptions of global stress and stressful life events.^[37] These findings, coupled with prior research showing the relation between hardiness to perception of stressful life events and role of psychosocial intervention to alter it.

There was also an association between CBTs have an effect in self-efficacy. There are few studies in this field, and there is no study conducted on this issue in female medical students, which limits the generalizability of the results. Therefore, it should be investigated in a larger sample in the future studies.

Moreover, the results of the present study indicated that group training of stress management can enhance general self-efficacy among university students. This finding is in line with those of the studies conducted by Shokhmgar *et al.*^[38] and Abolghasemi *et al.*^[39] Sahranavard and Miri^[40] Life skill is one of the stress management and mental pressure skills, which strengthens the ability of uniqueness in the individual, such that he feels committed and responsible toward his life, and activities like discussion and debate, lesson taking, activity in small groups results in presentation of different responses in unpredictable situations, which is the same self-efficacy. Self-efficacy influences how individuals think, feel, and

behave. The level of self-efficacy relies on the individual's choice of assignments, commitment, attempt, and skill acquisition.^[16]

Characteristic high self-esteem assuages the adverse influence of discrete or episodic threats to self-esteem on the immediate experience of negative self-feelings and on the need for maladaptive, subjectively undesirable, or socially disvalued responses to threats to self-esteem and concomitant negative self-feelings.^[41] In fact, self-esteem as a superordinate moderator of the relationship between putative stressors and the experience of stress may operate through other mechanisms as well.

The findings of the study by Mosalanejad *et al.*^[42] suggest that the increasing of self-efficacy leads to improved mental health so that those who have high self-efficacy scores have less mental health problems. Therefore, finding solutions that increase self-efficacy in students can somewhat prevent mental health problems and increase their compatibility with the environment. The results of present research are also consistent with the findings of Bahmani *et al.*^[13] Accordingly, stubborn people when confronted with anxiety factors, try to make a realistic assessment of these factors and to eliminate or suppress stressors by appropriate knowledge.

Based on the results of this study, it can be deduced that when anxiety increases in students, they will no longer have the ability to manage situations, change, cope, and challenge with problems, and will gradually undergo the energy diminishing and increasing anxiety. Therefore, these students will not be optimistic about their future and also their ability to solve problems; accordingly they will be disrupted in their lessons and dormitory life. On the other hand, by managing anxiety and stress they can maximize their ability to deal with problems and have better mental health and hardiness. The findings of this research will help students to improve their mental health factors by stress management.

The limitations of the study are that the sample in this study is a student group whereas their age range is limited, in order to generalize the data; similar research is also needed to be done on other samples with different ages. This research may be more beneficial using a large-scale study that will reveal the effects of anxiety more. Limitation can also occur due to the method of collecting responses from the participants at one point in time (cross sectional studies) that may create bias.

Conclusion

In this research, the findings and suggestions of previous research have been developed based on new variables. It is suggested that special attention be paid to students' feelings and emotions alongside educational issues. Educational practitioners should seek to improve emotional issues which enhances students' thinking and prepares them to cope with class challenges. This increases the student's academic skills and as a result, they expect more education and academic success. Many factors can affect students lived experience such as financial difficulties, academic stress, and future prospects; all of these can contribute to the experience of students.

Universities should also take it as a responsibility not only to produce knowledgeable graduates but also students that are balanced both mentally and in their chosen course.

In general, it can be stated that group plan of CBT-based stress management is effective in reduction of anxiety among university students; it enhances psychological hardiness and self-efficacy among them.

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Conflicts of interest

There are no conflicts of interest.

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