

Original Article

Comparison of the Effectiveness of Yoga Training Based on Mindfulness and Self-Management on Anxiety Symptoms in Adolescents

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Abstract

Background and Aim: Adolescence is one of the most important and at the same time the most stressful and traumatic stages of individuals' lives. Most of them may experience anxiety during this period. The purpose of this study was to compare the effectiveness of yoga training based on mindfulness and self-management on anxiety in adolescents.

Materials and Methods: This experimental study was a pretest-posttest design with a control group and follow-up. The statistical population of this study included all the female high school students in Karaj city in 2018-2019 academic year. 45 students were considered as the sample size in two experimental groups (each group of 15 students) and control (15 students). The experimental groups underwent approach yoga training based on mindfulness (12 sessions 90 minutes) and self-management training (12 sessions 90 minutes): but the control group received no training. To collect data Beck anxiety inventory of Beck, Epstein, Brown, and Steer (1988). Data analysis was performed using SPSS-24 software in two sections: descriptive and inferential (analysis of variance with repeated measures and Bonferroni).

Results: The results showed that yoga training based on mindfulness and self-management was effective in decreasing anxiety symptoms in adolescents ($P < 0.001$). The results also showed that the effect of both treatments was lasting until the follow-up stage ($P < 0.01$).

Conclusion: It can be concluded that self-management training has more effectiveness in reducing anxiety. Self-management education has helped to reduce students' anxiety by regulating emotions and managing stress and yoga-based mindfulness training by reducing impulses and stressors through relaxation.

Keywords: Adolescents, Anxiety, Mindfulness, Self-Management, Yoga training

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Introduction

Adolescence is one of the most important and at the same time the most stressful and traumatic stages of life in adolescents (1). Entering the adolescent period is accompanied by profound changes in terms of life, mental and social, which disturbs individual's physical and psychological balance and is referred to as crisis period (2). In addition, adolescence is a period of variable onset and duration between childhood and adulthood, including sexual problems (3), inability to regulate emotions (4), hopelessness (5), inability to make friends (6), and high-risk behaviors and drug abuse (7). In addition, anxiety disorders are very common among adolescents (9). In other words, anxiety is one of the basic human emotions that arise in response to some of the human emotions and physiological conditions and is responsible for informing the organism of an imminent danger (10). Also, anxiety is an emotional problem and one of the psychological disorders (11) with high levels of fear and worry (12) and high comorbidity with other disorders such as depression and mood disorder (13). According to the Diagnostic and Statistical Manual of Mental Disorders, anxiety is one of the most common psychiatric disorders including a mental state or severe arousal with fear, doubt, excessive and pathological worries (14). Various interventions have been used to reduce adolescent anxiety disorders, including mindfulness-based cognitive therapy (15), guided breathing-based mindfulness training (16), cognitive behavioral therapy (17), acceptance and commitment therapy (18). One of the effective interventions on adolescent anxiety is mindfulness-based yoga training (19), which is used as a non-pharmacological supplement to reduce the incidence of psychological diseases (20), including anxiety (21). According to one study, yoga has helped students to improve their resilience and self-regulation skills as well as stress management and thus reduce their anxiety against academic challenges and stresses (22). On the other hand, mindfulness is a practice of accepting feelings without judgment (23) and a kind of relaxation with attention control that affects sensory processes through affecting the range of attention,

beliefs, expectations, mood, and emotional regulation (24) and includes a receptive awareness and free from the judgment of current events (25). Awareness is the knowledge and ability to focus on one's inner processes which can lead (26) individuals to view their thoughts and feelings without judgment, evaluation, assumption, and consider them as simple transient subjective events (27). The combination of yoga and mindfulness as one of the programs of sports psychology is the way to calm the body and mind using the techniques of consciousness or mindfulness in which mindfulness is defined as a state of nonjudgmental attention and awareness of moment-to-moment experiences (28). Existing literature have demonstrated that mindfulness-based yoga education plays an important role in improving quality of life (29), reducing physical problems (30), improving depression symptoms (31), and reducing anxiety (32).

Another intervention that can play an important role in reducing the psychological and emotional problems of adolescents is self-management training (33). Effective and useful self-management can control the conditions and psychological, behavioral, and cognitive responses necessary to improve the quality of life. Therefore, self-management is based on a self-regulatory process (33). Management itself implies personal growth and maturity (34). Self-management training in adolescents can increase their self-esteem (35) and reduce depression and anxiety in people (36).

The importance of comparing two approaches of yoga training based on mindfulness and self-management is because these two theories examine problems from two different perspectives. Self-regulation is one of the most important strategies in self-management, plays an important role in improving the quality of life of individuals (33) but yoga training based on mindfulness is an approach that considers feeling regardless of individual's assessment and without judgment. Also, this training is a kind of relaxation with attention control that affects sensory processes (23). Considering the negative consequences of anxiety for adolescents, using psychological interventions to reduce these problems is of research importance and necessity. Considering that adolescent girls are an important part of Iranian society and the importance of addressing them in adolescence is not hidden to anyone. Therefore,

it is necessary to address factors that lead to the improvement of anxiety-induced problems in female adolescents. Therefore, the aim of the current study is to examine the effectiveness of mindfulness-based yoga training and self-management on adolescent anxiety.

Methods

This study was an experimental study with a pre-test, post-test design, and control group with a one-month follow-up phase. The statistical population consisted of female high school students in Karaj in the academic year of 2019-2020. The sampling method was that at first, one of the educational areas of Karaj city was selected by available method and among the schools in that district 3 schools were selected, and anxiety questionnaire was administered to them and among the students who achieved higher scores. 45 students were randomly into three groups; 15 in mindfulness-based yoga training, 15 in self-management group, 15 in control group.

Inclusion criteria were subjects with completion of informed consent and those with highest score on anxiety questionnaire, absence of more than 2 sessions of training sessions and simultaneous participation in other psychological sessions. This study observed some ethical principles such as explaining the research objectives for the sample subjects, obtaining informed consent from them, the right to withdraw from the study, harmless treatment intervention, answering questions, and providing the results if they wished, and presenting the intervention sessions intensively to the control group after the follow-up phase. In addition, this research has been approved by the Code of Ethics of IR.IAU.TMU.REC.1399.297 in research ethics committee of Islamic Azad University, Tehran University of Medical Sciences.

Materials

Beck Anxiety Inventory

This log was developed by Beck, Epstein, Brown, Steer in 1988. The score of the questionnaire is obtained in

Table 1: Mindfulness-based yoga therapy sessions (42).

| Sessions | Content |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First | Training of respiratory techniques, asanas (positions) in the upper extremity and lower respiratory (abdominal-diaphragm). |
| Second | Middle (thoreal) and upper breathing training (clavicle) |
| Third | Past sessions exercises and full breathing training. Complete breathing is a mixture of three three-step breathing techniques. |
| Fourth | Deep breathing training. In deep breathing, both the surface and depth of the lungs are filled and empty. |
| Fifth | Practice two techniques of full breathing and deep breathing and fix bugs. |
| Sixth | A cappellabhati breathing training. This breathing is accompanied by severe contraction and sound. |
| Seventh | Repeat and practice past sessions exercises. |
| Eighth | Biasterica breathing training: Ratherca means for blacksmith's tail. This exercise blows and spreads heat in the body. |
| Ninth | Practice breathing techniques past sessions and fix bugs. |
| Tenth | Brahmari breathing training (honey breathing). The practice of this breathing makes the inner subtle voice and awareness of the voice in the practitioner tangible. |
| Eleventh | Training of Analuma Willoma (intermittent breathing). In this breathing of the tail, the confinement of the tail and exhalation is done. The incarceration rate is four times that of the tail and the exhalation rate is twice that of the tail. |
| Twelfth | Training past sessions of practice and repetition. |

Table 2: Self-management meetings (43).

| Sessions | Content |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First | Familiarizing the members of the group with each other and with the researcher, explaining the concept of self-management and its effects, the importance of one's awareness of one's thoughts, feelings, and behaviors at the moment, and its role in self-management. |
| Second | Study of human dimensions (thoughts, emotions, body, and environment), thoughts including inner speech and imagination, the role of thoughts and its impact on other human dimensions |
| Third | How to change inner speech and challenge negative thoughts by bringing reason and how to balance thoughts, the necessity of replacing positive thoughts with negative thoughts in order not to return negative thoughts, strengthening "self" concerning abilities |
| Fourth | Explaining the concept of stress and its difference with anxiety, the necessity of stress management, investigating the signs and consequences of stress |
| Fifth | Explaining the concept of coping, investigating different coping methods, investigating the factors affecting coping, how to manage stress and applying cognitive strategies, emotional strategies, physical strategies, and behavioral strategies, explaining how to do relaxation |
| Sixth | Explaining the concept of coping, investigating the types of coping methods, investigating the factors affecting coping, how to manage stress and applying cognitive strategies, emotional strategies, physical strategies, and behavioral strategies, explaining how to do relaxation |
| Seventh | Explaining the speed of anger and the importance of being familiar with the signs of anger flare to manage it |
| Eighth | Introducing assertive skills as the most important and basic social skills, defining self-expression, examining the most important wrong beliefs about assertive self-expression in social relationships |
| Ninth | Check how to dare to apply a request |
| Tenth | Explaining the concept of problem-solving, the importance of problem-solving in life (assessing the consequences of having problem-solving skills), introducing problems that make problem-solving difficult |
| Elevent | Explaining the concept of purpose and consequences of having a goal (giving meaning and direction to life), familiarity with different types of targets (without purpose, low goals, logical and achievable goals and goals above and outside ability), and types of objectives in terms of duration (long-term, medium and short term) or low (general and partial), introducing desirable target characteristics (clear, realistic, accessible, time range and in positive sentences) |

the range of 0 to 63. The score of 0 to 9 normal anxiety, 10 to 18 mild to moderate anxiety, 19 to 29 moderates to severe anxiety, and 30 to 63 are classified as severe anxiety (37). The Cronbach's alpha for the trust coefficient for women was 0.90, men were 0.78 and the total log was 0.81 (38). In another research, Cronbach's alpha coefficient of questions ranged from 0.90 to 0.94 and the confidence coefficient of the retesting method within 7 weeks showed a correlation coefficient of 0.62 (39). Also, in other studies, Cronbach's alpha coefficient was 0.95 and the deposition coefficient was 0.92 (40), Cronbach's alpha coefficient was 0.91 (41). The present study used Cronbach's alpha to assess the validity of the log, which obtained coefficients for pre-test stages 0.67, post-test 0.78, and follow-up 0.78. Descriptive statistics (mean and standard deviation) and inference (analysis of variance with repeated measurements and Bonferroni test) and SPSS software version 24 were used.

Results

The results of the demographic variable showed that the mean (SD) age in the mindfulness-based yoga training group was 16.27 (4.22), self-management was 16.73 (5.15) and the control group was 16.53 (4.78). Based on the results of one-way variance analysis (ANOVA), all three groups had no statistically significant difference in terms of age (Sig=0.387, F= 0.970), indicating the similarity of the three groups in terms of age. The mean GPA in the mindfulness-based yoga training group was 15.93, self-management was 16.13 and the control group was 16.07. Based on the results of one-way variance analysis (ANOVA), all three groups had no statistically significant difference in average (Sig=0.908 and F= 0.097), indicating the similarity of the three groups in terms of GPA.

Table 3. shows the mean and standard deviation of

Table 3: Mean and standard deviation of anxiety in the experimental and control groups in the pre-test, post-test, and follow-up.

| Research Variables | Group | Step | M | SD |
|--------------------|-----------------|-----------|-------|------|
| Anxiety | Yoga Training | Pre-test | 50.33 | 4.03 |
| | | Post-test | 40.33 | 6.04 |
| | | Follow-up | 40.53 | 5.93 |
| | Self-management | Pretest | 51.33 | 4.94 |
| | | Posttest | 35.73 | 7.63 |
| | | Follow-up | 36.00 | 7.86 |
| | Control | Pre-test | 51.00 | 3.92 |
| | | Post-test | 49.93 | 4.13 |
| | | Follow-up | 50.13 | 4.21 |

Table 4: Results of analysis of variance of repeated measurement of anxiety.

| Research Variables | Source of change | | F | P | Eta |
|--------------------|------------------|------------|--------|-------|------|
| Anxiety | Between subject | Group | 13.973 | 0.001 | 0.40 |
| | Within subject | Time | 35.86 | 0.001 | 0.73 |
| | | Time*Group | 22.19 | 0.001 | 0.56 |

Table 5: Results of anxiety Bonferroni follow-up test in the pre-test, post-test, and follow-up.

| Dependent variable | Adj. Mean | | Tests | Mean Diff. | P |
|--------------------|-----------|-------|--------------------|------------|-------|
| Anxiety | Pretest | 12.16 | Pretest-Posttest | 8.88 | 0.001 |
| | Posttest | 10.40 | Posttest-Follow-up | 8.66 | 0.001 |
| | Follow-up | 10.26 | Pretest-Follow-up | -0.22 | 0.081 |

Table 6: Comparison of pairs with Bonferroni's follow-up test to determine the effect of a more effective method on anxiety.

| Variables | I-J | Mean difference | P |
|-----------|-------------------------------|-----------------|-------|
| Anxiety | Yoga Training-self-management | 2.71 | 0.429 |
| | Yoga Training-Control | 6.62 | 0.002 |
| | Self-management- Control | 9.33 | 0.003 |

anxiety in the experimental and control groups in the pre-test, post-test, and follow-up in the sample. The results of repeated variance analysis are mentioned. To use inferential analysis, repeated variance of the assumptions of this analysis was investigated. Shapiro-Wilks test was used to evaluate normality and dependent variables were normal. The default homogeneity of variances (post-test) was investigated by Levene's test, and this assumption was confirmed in the post-test stage ($P > 0.05$). The results of the box test for another default study of this test, variance-covariance equivalence, were not statistically

significant and this means establishing the assumption of the equality of variance and covariance matrix. Also, the Mauchly sphericity test showed a significant level for dependent variables equal to 0.001. Therefore, the spherical assumption is rejected. Consequently, the assumption of the same variances and more precisely the homogeneity condition of the quadrivalency matrix was not assured and therefore, the violation of the statistical model F has been done. As a result, alternative tests were used for the conservative Greenhouse-Geisser test to investigate the effects within the treatment subject, the results of which are

listed in Table 4.

The results of Table 4 showed that mindfulness-based yoga training and self-management on anxiety were significant. This means that there is a significant difference between the groups in post-test and follow-up compared to the pre-test. The effect of intergroup variable of interventions was also significant in reducing anxiety. This means that the interventions have been able to reduce the anxiety score compared to the control group. Then, to compare two to two, the mean adjustment of the test stages (pre-test, post-test, and follow-up) anxiety is mentioned in Table 5.

Based on the results of Table 5, "the difference between the mean of the pre-test and the post-test" and "the difference between the mean of the pre-test and the follow-up" is more and more significant than the "difference between the mean of post-test and follow-up", which indicates that educational interventions have influenced the reduction of anxiety in the post-test stage and this has had a significant effect on the follow-up stage. In the following, the Bonferroni follow-up test (to compare the effectiveness of intervention groups) has been used to investigate the difference between the effectiveness of mindfulness-based yoga training and self-management on anxiety reduction, which results are described in Table 6.

According to Table 6, the results showed that the difference between the mean of self-management training and the control group was greater than the difference between the mean of mindfulness-based yoga training treatment and the control group, which indicates that self-management training has more effectiveness in reducing anxiety.

Discussion

The results showed that mindfulness-based yoga training and self-management affected anxiety in the post-test phase and the continuation of this effect in the follow-up phase. The results also showed that self-management training has more effectiveness in reducing anxiety. As a result, the research hypothesis that there is a difference between the effectiveness of mindfulness-based yoga training and self-management on adolescent anxiety was confirmed. Although no research has shown that there is a difference between the effectiveness of mindfulness-

based yoga training and self-management on adolescent anxiety. The results are aligned with the research results of Høifødt *et al.* (38), Saidian, Became, Nili Ahmadabadi, Salimi Bajestani (34), and Amin, Bibi, Khawar (44) who have demonstrated the effectiveness of these treatments, especially their management. In explaining the effectiveness of mindfulness-based yoga training on adolescents' anxiety, it can be said that physical exercise, breathing methods, and meditation in yoga not only affect the body through relaxation and relaxation of muscles but also affect the neurons of the central brain system. Yoga is a treatment that can reduce people's anxiety symptoms. In yoga, the mind is considered as the center of disorder and it is attempted to return the body to the state of inner equilibrium (45). Since people face stressful situations many times a day and this may reduce their resilience, it is possible to design a way of living in such a way that through exercise and physical activities, especially yoga, anxiety levels in people can be reduced and resilience promoted. Bypassing through the level of mind and feeling, yoga offers a proven way to achieve health in the body. Yoga is not only a sporting method that emphasizes only some physical movements, but also a set of physical exercises and exercises that also have exercises to release mental energies. These same unleashed energies in adolescents cause them to experience less anxiety. Therefore, it is logical that mindfulness-based yoga training affects adolescents' anxiety.

In explaining self-management training on adolescents' anxiety, it can be said that self-management training and similar concepts can be effective in reducing the symptoms of psychological disorders such as anxiety and this indicates that this training can be effective in managing and regulating emotions. Inappropriate emotional responses in the face of psychological stress such as feelings of sadness and distress, and unsuitable strategies for emotion regulation cause short-term emotional distress among adolescents. Adolescents with emotional skills, (i.e., those who know their feelings well and regulate them and understand and deal with other people's feelings efficiently), are also successful and efficient in different areas of life. Emotion regulation skills as an important element in self-management training allow people who are emotionally vulnerable to be present and thus gain a

more objective understanding of the threat rather than reacting too much and anxious to the situation (46). Therefore, the focus of emotion regulation therapy is on positive and negative emotions and strengthening them. Since the emotional processes of adolescents in these ages may affect their cognitive system, therefore, by recognizing and awareness of these emotional processes, the cognitive system of these people can be regulated, and their anxiety can be prevented at these ages. Therefore, it is logical that self-management training affects adolescents' anxiety (47).

In explaining the effectiveness of self-management toward mindfulness-based yoga training on reducing anxiety in adolescents, it can be explained that although mindfulness-based yoga therapy can help adolescents to temporarily reduce their adolescent impulses and stresses by relaxing their mind and relaxation, what helps him more is his management skill. Having the management of thoughts can facilitate the consolidation of identity and coherence of thoughts, the decision to continue or quit education, choosing a job, starting a family, entering political and social movements, identifying important issues in life, and planning, etc. (48). It can also be said that managing emotions makes it possible to be aware of positive and negative emotions and harmonize them in a complex and orderly structure, and as a result, it helps the person to regulate their intense emotions and act reasonably. Therefore, proper use of emotions facilitates the flow of thinking and prevents distress in thoughts and feelings and adolescents experience less anxiety in this period of their life. This is due to the greater effectiveness of self-management training than mindfulness-based yoga therapy on reducing adolescents' anxiety (49).

Since this research has been conducted on female students of secondary school in Karaj, in generalizing the results of this study to students of other cities due to cultural, ethnic, and social differences, necessary precautions should be taken by researchers and users of the results of this study. This study could have been done both quantitatively and qualitatively (in combination), but due to the lack of interview conditions, this possibility was not available in the present study and one of the barriers and limitations of this research was this case. In the first stage of the

study, due to sampling method and the use of available sampling method cannot be introduced from the general population of students, so generalization of the results is limited. Data and data related to the research variables were collected through self-report of participants and by questionnaire, which is influenced by effective factors such as respondents' tendency to provide community-friendly responses. Similar studies in other cities and cultures should be conducted on female secondary school students in other cities so that the results of the studies are comparable. Applied research design with similar topics should be conducted on the effect of mindfulness-based yoga education and self-management on other problems of adolescents such as resilience, distress tolerance, emotional dysregulation, stress, and depression. Conducting research on comparing mindfulness-based yoga education and self-management with other therapeutic methods such as cognitive-behavioral therapy, commitment-acceptance therapy, self-compassion treatment, etc. can have effective results in improving the problems of female adolescents. In addition to using self-reporting tools in which bias is possible, it is suggested that other research methods such as interviews and observations be used to measure this variable to minimize biases. Mindfulness-based yoga training and self-management were effective on adolescents' anxiety. Accordingly, psychologists, counselors, and therapists are recommended to help adolescents gain more self-control and less anxiety in times of psychological problems by holding psychological workshops of mindfulness-based yoga training and self-management training. In this way, sports teachers in secondary schools can use these therapeutic methods to improve their anxiety by holding mindfulness-based yoga sessions and teaching their management along with other physical exercises to students. Therefore, mindfulness-based yoga can be used as a convenient, accessible, and low-cost treatment for adolescents' anxiety treatment. According to the findings of this study that self-management training is effective in reducing adolescents' anxiety, it is suggested that this education be considered as a life skills training package by centers that are in contact with adolescents. It should be noted that teenagers who participated in self-management group training, demonstrating a great welcome to attend these meetings, insisted on

continuing the meetings and stated that they wished to introduce this class to others. Therefore, considering the welcome of this education by adolescents to schools, it is suggested to use this educational program as an extracurricular activity in schools to help reduce adolescents' anxiety .

Comparing the effectiveness of mindfulness-based yoga training and self-management on adolescents' anxiety. The results showed that mindfulness-based yoga training and self-management affected anxiety in the post-test stage and the continuation of this effect in the follow-up phase. The results also showed that self-management training has more effectiveness in reducing anxiety. As a result, the research hypothesis that there is a difference between the effectiveness of mindfulness-based yoga training and self-management on adolescent anxiety was confirmed.

Conclusion

It can be concluded that self-management training has more effectiveness in reducing anxiety. Self-management education has helped to reduce students' anxiety by regulating emotions and managing stress and yoga-based mindfulness training by reducing impulses and stressors through relaxation.

Acknowledgment

None.

Conflict of Interest

The authors declare that they have no conflict of interest.

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