Comparing the Effectiveness of Wales' Meta-cognition Training with Kabat-Zinn's Mindfulness Training on Academic Procrastination of Students with Math Anxiety

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ARTICLE INFORMATION	ABSTRACT
	Background and Aim: Math anxiety is a widespread problem for all ages worldwide; In international assessments and based on studies of international planning of students, most teenagers have reported anxiety and tension in math classes and when doing math exercises; Therefore, the present study was conducted to compare the effectiveness of Wales' metacognition training with Kabat Zinn's mindfulness training on academic procrastination of students with math anxiety. **Methods:** In this research, a quasi-experimental research method of pre-test and post-test design was used with two experimental groups and one control group; The statistical population of this research includes all female students in the second year of high school in the 6th district of Tehran in the academic year 2021-2022. 45 people who met the criteria for entering the research were selected by multi-stage cluster sampling method and were randomly and equally divided into two experimental groups and one control group. The first experimental group underwent Wales metacognition training in 8 sessions of 60 minutes, and the second experimental group underwent mindfulness training in 8 sessions of 120 minutes, and the control group remained waiting without any intervention during this time. The research tools include Pleck and Parker's math anxiety questionnaire (1982) and Solman and Rothbloom's academic procrastination scale (1984). The data analysis of this research was done in two parts: descriptive (central and dispersion indices, skewness and kurtosis) and inferential (MANCOVA) using SPSS-23 software. **Results:** The results showed that both Wales metacognition training and Kabat-Zinn mindfulness training are effective on the academic procrastination of students with math anxiety. Also, the results indicated that these two treatments are effective on the academic procrastination of students with math anxiety. **Conclusion:** The results showed that the effectiveness of Kabat-Zinn mindfulness therapy on academic procrastination and its subscales is more than that of Wales' metacognitive therapy.

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Introduction

Anxiety disorders are one of the most common mental health issues worldwide. In educational settings, individuals may suffer from specific forms of test anxiety and performance anxiety, of which, undoubtedly, one of the most prominent is math anxiety (Anarinejad et al., 2022). Math anxiety is a type of evaluation anxiety. According to the stage of its occurrence, it is known as evaluation or self-threat of the test situation, which occurs in abnormal cognitive conditions against academic stressors and is accompanied by physical symptoms and tensions. This abnormal response to highly stressful situations leads to a decrease in performance and more academic procrastination (Potvin & Daniel, 2015).

Procrastination regarding academic assignments is a common problem among students (Lee, Gao, and Zhou, 2020) and is one of the most important causes of failure or failure of learners to learn and achieve academic progress programs (Lewinger, Kuo, Song, et al., 2016). There are two types of procrastination, which include behavioral procrastination (intentional delay in main and secondary tasks) and procrastination in making decisions about important life matters (Klein, Botel, Muller et al., 2019). Procrastination in the field of mental health causes problems such as depression, damage to self-esteem, anxiety, and reduced quality of life, and in the field of education, problems such as avoiding lessons and assignments and poor academic performance (Haqmohammadi & colleagues, 2021). As much as it is undesirable, procrastination is a natural and inseparable part of the behavior of the majority of people in society. Its continuous repetition and intensity can be a serious obstacle for people to achieve progress, and success and then gain a sense of satisfaction with life (Moradaghli et al., 2021).

Metacognitive therapy can be mentioned among the therapeutic models that can be used to achieve these goals. According to the conducted research, it seems that metacognition is the basis of many psychological disorders (Smith and Hunt, 2016) and plays an essential role in aggravating mental disorders (Motamadi et al., 2018). In metacognitive therapy, the therapist focuses and emphasizes on recognizing metacognitive beliefs, metacognitive experiences, as well as metacognitive strategies of the person as three main psychological processes (Heimdal, Sulim, Hagan et al., 2019).

By strengthening regulation strategies and increasing abilities such as evaluation, planning, attention, and removing cognitive, emotional, and behavioral threats, this treatment allows the person to deal with his academic assignments and tasks with more power and efficiency. Completing homework requires mental peace and security, as well as having many management strategies, such as paying attention to evaluation and planning. People who are immersed in negative metacognitive strategies certainly experience a lot of tension and failure in handling their homework (Saadati, Tahergholami, and Jalai, 2019). The tension and frustration that can affect them toward education and somehow lead them to academic procrastination (Ilanlo et al., 2022).

One of the characteristics of procrastinators is that they are afraid of failure, suffer from low self-efficacy, and are pessimistic and not hopeful about the future. In fact, their minds are full of judgmental and negative thoughts that hinder their productive activity and lead to procrastination. Mindfulness-based therapy can help a person recognize the degree of difficulty of the task and reduce stress by increasing concentration and reducing stress (Sayadi Ghasbeh & Moqtadar, 2021). This approach improves psychological states by emphasizing issues such as acceptance, mindfulness, values, spirituality, and dialectical relationships (Ahmadi, Khairati, and Ghobaribnab, 2019). Mindfulness approaches try to change thoughts, feelings, and actions related to stress. Mindfulness techniques traditionally include one type of therapy: cognitive restructuring, therapies based on coping skills, and therapies based on problem-solving. The goal of cognitive restructuring is to create and maintain thought patterns that are more adaptive and less stressful (Barra et al., 2018). This means that people who experience an increase in mindfulness are more focused on the present moment and internal and external stimuli than those with less mindfulness (Habibi, 2019). Applying appropriate strategies in different educational situations will reduce academic procrastination in them, and they will perform more successfully in education. Education and investment in the field of these influential variables can significantly impact the growth and success of students in the future. The present study seeks to answer the question, is there a difference between the effectiveness of

Wales' metacognitive training and Kabatzin's mindfulness training on the academic procrastination of students with math anxiety?

Method

In this research, a quasi-experimental research method of pre-test and post-test design was used with two experimental groups and one control group; The statistical population of this research includes all female students in the second year of high school in the 6th district of Tehran in the academic year 2021-2022. 45 people who met the criteria for entering the research were selected by multi-stage cluster sampling method and were randomly and equally divided into two experimental groups and one control group. The first experimental group underwent Wales metacognition training in 8 sessions of 60 minutes, and the second experimental group underwent mindfulness training in 8 sessions of 120 minutes, and the control group remained waiting without any intervention during this time. The research tools include Pleck and Parker's math anxiety questionnaire (1982) and Solman and Rothbloom's academic procrastination scale (1984). The data analysis of this research was done in two parts: descriptive (central and dispersion indices, skewness and kurtosis) and inferential (MANCOVA) using SPSS-23 software.

Materials

1) Pleck and Parker (1982) Mathematical Anxiety Test Questionnaire. This scale was developed by Plick and Parker in 1982 to assess anxiety related to participation in mathematics and statistics classes. This scale includes 24 statements and two subscales of math learning anxiety, which is related to the process of learning math and numbers (16 statements) and math assessment anxiety, which is related to the subject's anxiety in the math assessment situation (8 statements). This scale is graded with a 5-point Likert scale from very slight anxiety (1) to high anxiety (5).

2) Academic procrastination scale (1984). This scale was developed by Solman and Rothbloom in 1984 to measure the frequency of cognitive behavioral antecedents of procrastination. This scale has 27 items and three subscales of coming for the exam (8 items), preparing for assignments (11 items) and preparing for the final semester or practical work (8 items), which are graded on a 5-point Likert scale.

3) Wales Metacognition Training Protocol. Wales metacognitive training sessions were conducted in 8 60-minute sessions based on the

training package of Wales (2009) on the subjects of the experimental group.

4) Kabat Zinn mindfulness training protocol. Mindfulness training sessions were held in 8 2-hour sessions based on the model provided by Kabatzin.

Results

The results showed that both Wales metacognition training and Kabat-Zinn mindfulness training are effective on the academic procrastination of students with math anxiety. Also, the results indicated that these two treatments are effective on the academic procrastination of students with math anxiety.

Conclusion

This research was conducted in Tehran and in generalizing its results to other conditions, attention should be paid to the situational similarity and cultural differences. Since the statistical population of this research is a small part of society and is composed of female students in the second year of high school in the 6th district of Tehran, in a specific and limited period, in generalizing the findings to other members of the society, attention should be paid to the limited and specific nature of the sample. In this research, the only tool used was a questionnaire, which can be subjected to carelessness, lack of enthusiasm or personal perceptions of the subjects. In order to be sure about the results of this research, it is suggested to carry out more extensive research in larger societies and on different gender groups so that the comparison between girls and boys is possible. Suppose the results of the current research and numerous studies carried out in mindfulness training and on different variables, especially in the group of students, have brought positive results. Thus, the educational method of mindfulness can be used as an effective primary prevention method to improve students' academic performance and ensure their mental health. It can be taught as a lesson unit or a chapter of educational books in different courses, including elementary, middle and high school.

Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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