KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 25 June 2023
Accepted 21 August 2023
Published online 20 September 2023

Journal of Assessment and Research in Applied Counseling

Volume 5, Issue 3, pp 94-102

E-ISSN: 3041-8518

Comparing the Effectiveness of Wells' Metacognition Training with Kabat-Zinn's Mindfulness Training on Self-Efficacy of Students with Math Anxiety

Sepideh. Mohammad Salehi[1], Naser. Yousefi[2*], Omid. Moradi[3]

[1] PhD student in Educational Psychology, Department of Psychology, Qom Branch, Islamic Azad University, Qom, Iran
[2] Associate Professor, Counseling Department, Faculty of Humanities and Social Sciences, University of Kurdistan, Kurdistan, Iran
[3] Associate Professor, Family Counseling Department, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran

*** Corresponding author email address**: naseryoosefi@yahoo.com

A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Mohammad Salehi, S., Yousefi, N., & Moradi, O. (2023). Comparing the Effectiveness of Wells' Metacognition Training with Kabat-Zinn's Mindfulness Training on Self-Efficacy of Students with Math Anxiety. *Journal of Assessment and Research in Applied Counseling, 5*(3), 94-102.
https://doi.org/10.61838/kman.jarac.5.3.13

A B S T R A C T

Objective: The present study aimed to compare the effectiveness of the Wells' metacognitive training with Kabat-Zinn's mindfulness training on the self-efficacy of math-anxious students.

Methods and Materials: This was a quasi-experimental study with two experimental groups and a control group. The statistical population of this research included all female students in the second grade of high schools in the 6th district of Tehran during the academic year of 2021-2022. Among them, 45 students who met the entry criteria were selected through a multistage cluster sampling method and randomly assigned to two experimental groups (one receiving Wells' metacognitive training for 8 sessions of 60 minutes and the other receiving Kabat-Zinn's mindfulness training for 8 sessions of 120 minutes) and a control group who received no intervention during that time. The research instruments included the Plake and Parker's Math Anxiety Scale and Sherer et al.'s General Self-Efficacy Scale. Data analysis was conducted using descriptive statistics (central indices, dispersion, skewness, and kurtosis) and inferential statistics (multivariate analysis of covariance (MANCOVA) with SPSS-23 software.

Findings: There is a significant difference between the mean of the control group and the two experimental groups in both variables. However, no significant difference was observed between the two experimental groups.

Conclusion: The results indicated that both Wells' metacognitive training and Kabat-Zinn's mindfulness training are effective in improving the self-efficacy of math-anxious students and both interventions are effective. However, the effectiveness of Wells' metacognitive training was similar to Kabat-Zinn's mindfulness training on academic self-efficacy.

Keywords: *mindfulness, metacognition, self-efficacy, math anxiety.*

1. Introduction

Math anxiety is one of the effective barriers to students' academic progress. One of the problems that is seen among students is the difficulties they face in dealing with math, leading to fear of exams and the emergence of their subsequent consequences. One of these consequences is math anxiety (Alkan, 2018). Math anxiety is a type of mental preoccupation that is manifested by a person's self-doubt about their abilities, efficacy, and performance in exam situations, often resulting in negative cognitive evaluation, lack of attention and academic underachievement (Anis, Krause, & Blum, 2016). Math anxiety is also a type of mental self-absorption characterized by self-doubt about one's abilities, often leading to negative cognitive evaluation, lack of attention and academic underachievement (Tian, Fang, & Li, 2018). Consequently, it is expected that there will be a significant inverse relationship between anxiety scores and exam scores. Clements et al. (2017) also define math anxiety as the inability of the individual to cope with quantitative situations, including situations involving numbers and figures, generally involving mathematics (Clements, Fuson, & Sarama, 2017). Moving towards academic progress is based on increasing some important variables such as self-efficacy (Aghaziarati et al., 2020).

Self-efficacy beliefs about academic performance affect individuals' learning and can either decrease or increase their success. As one's knowledge about a subject decreases, self-efficacy beliefs about that subject also decrease (Yasiliyurt, Alas, & Akan, 2016). According to Bandura's perspective (1997), individuals' self-efficacy beliefs influence their feeling, thinking, arousal, behavior, and overall progress (Parsakia, Rostami, & Saadati, 2023). Individuals with low self-efficacy and no belief in their abilities are less likely to participate in activities related to those abilities (Mikhak & Moradi, 2022). Bandura (1988) believes that self-efficacy is the main agent of human growth and a powerful source of protecting individuals against mental pressures. It also affects how potential threats are perceived. He explained the important role of both threatening events and self-efficacy in anxiety arousal and argued that the main source of anxiety arousal is not the threat itself but rather the lack of self-efficacy to silence it (Wongsuwan & Na-Nan, 2022). Specifically, academic self-efficacy means confidence in performing academic tasks such as reading books, answering questions in class, and preparing for exams (Ganesh et al., 2018). In fact, the thoughts, feelings, and behaviors of students in situations where they are confident are different from situations in which they feel insecure, incompetent, or anxious (Zamfir & Mocanu, 2020). Low levels of academic self-efficacy result in lower GPAs and less stability in completing tasks. As a result, students with lower academic self-efficacy have less academic adaptability and employ less effective learning strategies, resulting in weaker performance (Pouraslan, 2022).

In educational environments, adopting supportive policies in the form of providing various social supports can be a useful solution in increasing student self-efficacy by establishing supportive flows in a way that enrich people's beliefs and increase their cognition and metacognition. Cognition refers to the internal mental processes or ways in which information is processed. Cognitive strategies, as learning tools, include repetition or review strategies, expansion or semantic strategies, and organizational strategies. Metacognition refers to an individual's knowledge of how they learn (Acmed-Ismael, 2021; Hermita & Thamrin, 2015). Metacognition and awareness of cognitive processes have become one of the important and influential areas in the cognitive and educational fields in recent years. Learning, which is how to learn in the age of information, is the most emphasized aspect of educational systems. Therefore, when a student needs help to do their homework, they should be aware of their needs (monitoring), decide to seek help (strategy), and use strategies to utilize the help of others to solve the problem (adaptation) (Tian, Fang, & Li, 2018; Yagan, 2022). For example, students with poor metacognitive skills have trouble realizing that they do not understand what they are reading (monitoring) (Gbenga-Akanmu & Jegede, 2019). Some concluded that metacognitive instruction has an important role in the success of students and can compensate for their cognitive weaknesses (Hoseinkhani, Ghasemi, & Hejazi, 2021; Safarzadeh & Jayervand, 2019; Yousef Vand & Alavi, 2018). Overall, research findings have shown that students who seek help more often when they need it perform better and have higher self-efficacy. Hermita and Thamrin (2015), after a study on the effect of metacognitive strategies on the psychological well-being and self-efficacy of students, reported that teaching metacognitive strategies leads to an increase in students' psychological well-being and self-efficacy (Hermita & Thamrin, 2015). The results of the research by Yousef Vand and Alavi (2018) on the effectiveness of teaching metacognitive strategies on the well-being, creative self-efficacy, and academic motivation of high school students indicate that teaching cognitive and

JARAC Assessment and Research in Applied Counseling
E-ISSN: 2821-2738

metacognitive strategies leads to an increase in the well-being, creative self-efficacy, and academic motivation of students in secondary school (Yousef Vand & Alavi, 2018).

One of the treatments that improves self-efficacy in students with math anxiety is mindfulness-based therapy. Mindfulness approaches attempt to change thoughts, feelings, and behaviors related to stress (Zare & Aghaziarati, 2018). Mindfulness techniques traditionally include a type of therapy: cognitive restructuring, coping skills-based treatments, and exposure-based treatments (Aghaziarati et al., 2023). The goal of cognitive restructuring is to create and establish thought patterns that are more adaptive and less stress-inducing. This means that individuals who experience increased mindfulness are more focused on the present moment and internal and external stimuli and are less likely to procrastinate compared to those with less mindfulness (Habibi, 2019). Research shows the efficacy of Wells' metacognitive therapy on academic self-efficacy (Safarzadeh & Jayervand, 2019; Tian, Fang, & Li, 2018; Yagan, 2022; Zhou, Lam, & Zhang, 2022; Ziegler & Opdenakker, 2018). Studies also confirm the effectiveness of Kabat-Zinn mindfulness treatment on academic self-efficacy (Ghanbaritalab, Javanmard, & Rezaei, 2019; Tavakoli & Ebrahimi, 2020). Students during their academic life face challenging situations and if they do not act properly, they risk their mental health, which can lead to declining academic performance, dropping out of school, or even expulsion (Hoseinkhani, Ghasemi, & Hejazi, 2021). Conversely, using appropriate strategies in various educational situations enhances their self-efficacy and leads to successful academic performance (Parsakia et al., 2022). Therefore, investing in and educating these influential variables can have a significant impact on the growth and success of students in the future. Since no comparative study has been conducted on the effectiveness of mindfulness and metacognition therapies on these variables, this study aims to answer the question of whether there is a difference in the effectiveness of Wells' metacognitive therapy and Kabat-Zinn mindfulness therapy on the self-efficacy of students with math anxiety.

2. Methods and Materials

2.1. Study Design and Participants

In this study, a quasi-experimental research design using pre-test and post-test with two experimental groups and one control group was employed. The statistical population consisted of all female students in the second year of high school in district 6 of Tehran in the academic year 2021-2022. Sampling was done cluster-wise and voluntarily. To provide the desired sample, four schools were selected through multistage cluster sampling method from the schools of district 6 of Tehran. Then, the math anxiety test was administered to the students of these schools who met the inclusion and exclusion criteria (the inclusion criteria for participating in the study included: studying in the second year of high school in one of the schools in district 6 of Tehran, not suffering from chronic physical or psychiatric illnesses, not taking any psychiatric medication, living with both parents (not being a child of divorce), not participating in psychology workshops or seminars, having a tendency to participate in training classes. The exclusion criteria included: not attending more than 2 sessions of the training, being infected with severe COVID-19 during the course of the study, and lack of interest in continuing to participate in the study by the participants). Then, 45 people with math anxiety whose scores were one standard deviation higher than the mean were randomly selected and placed in two experimental groups and one control group in equal numbers.

2.2. Measures

2.2.1. Math Anxiety

The Mathematics Anxiety Scale by Plake and Parker (1982): This scale was developed by Plake and Parker in 1982 to assess anxiety related to participating in math and statistics classes. There is an emphasis on situation-specific anxiety and trait anxiety, as well as test anxiety. This revised scale is a self-report tool consisting of 24 statements and two sub-scales of math learning anxiety related to the process of learning math and numbers (16 statements) and math assessment anxiety related to the amount of anxiety experienced by the subject in the math evaluation situation (8 statements). This scale is scored on a 5-point Likert scale ranging from very little anxiety (1) to a lot of anxiety (5). The overall Cronbach's alpha reliability coefficient of the test was measured by Plake and Parker (1982) on 170 college students attending math and statistics classes, and was found to be 0.98, indicating a desirable reliability of the test. The validity of the test was also presented to 91 males and 90 females who participated in the first stage and the validity index of the test was obtained to be 0.88 (Plake & Parker, 1982).

JARAC Assessment and Research in Applied Counseling
E-ISSN: 2821-2738

2.2.2. *Self-efficacy*

The Sherer et al. Self-Efficacy Scale (1982) was created by Sherer et al. in 1982 to measure general self-efficacy without specific performance conditions or age restrictions. This test consists of 17 items. The questionnaire is scored on a 5-point Likert scale where items 1-3-8-9-13 and 15 are scored from right to left, and the others are scored from left to right. Sherer et al. (1982) reported the internal validity of the scale to be 0.86 and its validity to be acceptable (Sherer et al., 1982).

2.3. *Interventions*

2.3.1. *Wells' Metacognitive Therapy*

Wells' Metacognitive Training Protocol: Wells' metacognitive training sessions were conducted in 8 60-minute sessions based on the Wells training package (2021) on participants in the experimental group (Wells, 2021). The goal of each session and the activities performed in each session are briefly mentioned in Table 1.

Table 1

Wells' metacognitive therapy sessions

Session	Objective	Activities
1	Introduction of the program, expectations and regulations, the framework of metacognition, and a description of the logic of treatment.	Training on the defusion mindfulness technique (Cloud Metaphor)
2	The relationship between thoughts and aspects of life.	Suppressing thoughts exercise
3	Control of internal experiences and experimentation with concentration.	Concentration test (eating raisins)
4	Challenges with beliefs of uncontrollability and cognitive distortions.	Exercising mental defusion
5	Stopping non-adaptive thoughts and behaviors.	Delaying worry exercise
6	Understanding the student's knowledge of thought uncontrollability.	Verbal reappraisal exercise
7	Cognitive reconstruction through directed attention in the individual.	Conducting attention technique exercise
8	Review of past sessions.	Post-test"

2.3.2. *Kabat-Zinn's Mindfulness Therapy*

Kabat-Zinn's Mindfulness Training Protocol: Mindfulness training sessions were held in 8 two-hour sessions based on the model proposed by Kabat-Zinn. At the end of each session, the therapist assigns tasks to be performed between sessions and participants are requested to perform those tasks during the break (Kabat-Zinn, 2003). A summary of the therapy sessions is presented in Table 2.

Table 2

Kabat-Zinn's mindfulness therapy sessions

Session	Content
1	Appointment and introduction, defining anxiety and addressing math anxiety, types of response to anxiety and the cycle of thought, emotion, and bodily sensation.
2	The relationship between teaching rational situation assessment and teaching relaxation.
3	Physical exercise training - starting exercise with a focus on short breathing.
4	Training in positive self-talk and diaphragmatic breathing with visualization.
5	Training in effective coping styles and effective coping with stressors.
6	Increased focus on the body and mental whispers.
7	Expressiveness in interpersonal relationships.
8	Overall review of sessions and addressing concerns.

2.4. *Data analysis*

Data analysis was conducted using descriptive statistics (central indices, dispersion, skewness, and kurtosis) and inferential statistics (multivariate analysis of covariance (MANCOVA) with SPSS-23 software.

3. Findings and Results

In this section, a descriptive statistics analysis of self-efficacy is first provided, based on which the mean and standard deviation of the self-efficacy scores in the pre-test and post-test stages in the experimental and control groups are reported (Table 3).

JARAC Assessment and Research in Applied Counseling
E-ISSN: 2821-2738

Table 3

Descriptive statistics findings (M: Mean, SD: Standard deviation)

Variable	Group	Index	Pre-test	Post-test
General Self-efficacy	Metacognitive	M	31.93	65.00
		SD	6.65	11.01
	Mindfulness	M	32.47	62.20
		SD	7.39	10.30
	Control	M	27.27	29.80
		SD	7.11	9.37

As can be seen, the mean in the two experimental groups in the post-test stage shows an increase compared to the pre-test. No significant change is observed in the control group. By performing the covariance analysis, its results are presented for the hypothesis testing in Table 4.

Table 4

The results of between-group effects test

Source	SS	Df	MS	F	p	Effect size
Corrected model	11483.200	2	5741.600	54.672	0.000	0.722
Intercept	123245.000	1	123245.000	1173.549	0.000	0.965
Group	11483.200	2	5741.600	54.672	0.000	0.722
Error	4410.800	42	105.019			
Total	139139.000	45				
Corrected Total	15894.000	44				

Table 4 results show that by removing the effect of the pre-test variable, the research hypothesis regarding the significant difference in general self-efficacy between the experimental groups compared to the control group is confirmed. As can be seen from the results in Table 4, the obtained significance level for self-efficacy and procrastination compared to the significance level of 0.0125 obtained from the Bonferroni correction is smaller. Therefore, considering the obtained means, it can be said with 95% confidence that the general self-efficacy of the experimental groups has changed compared to the control group. Finally, pairwise comparisons are given. As can be seen, the mean of each variable at each level is subjected to pairwise comparisons, and the corresponding results are displayed (Table 5).

Table 5

Pairwise comparison of means with Bonferroni's method

Variable	Group (I)	Group (J)	Mean diff (I-J)	Standard error	Sig.
General Self-efficacy	Control	Metacognitive	35.20*-	3.742	0.000
		Mindfulness	32.40*-	3.742	0.000
	Metacognitive	Control	35.20*	3.742	0.000
		Mindfulness	2.800	3.742	1.000
	Mindfulness	Control	32.40*	3.742	0.000
		Metacognitive	2.800-	3.742	1.000

As shown in Table 5, there is a significant difference between the mean of the control group and the two experimental groups in both variables. However, no significant difference was observed between the two experimental groups. Therefore, Wells' metacognitive training and Kabat-Zinn's mindfulness training increase the general self-efficacy of students with math anxiety.

4. Discussion and Conclusion

The present study aimed to compare the effectiveness of Wells' metacognitive training with Kabat-Zinn's mindfulness training on self-efficacy in students with math anxiety. The results showed no significant difference between the effectiveness of Wells' metacognitive training

JARAC Assessment and Research in Applied Counseling E-ISSN: 2821-2738

and Kabat-Zinn's mindfulness training on general self-efficacy in students with math anxiety. These findings are consistent with previous research (Motie et al., 2019; Tavakoli & Ebrahimi, 2020; Tian, Fang, & Li, 2018; Vidic & Cherup, 2019; Yousef Vand & Alavi, 2018; Zahmatkesh et al., 2018; Zhou, Lam, & Zhang, 2022). In explaining the effectiveness of Wells' metacognitive training on general self-efficacy, it can be said that self-efficacy refers to individuals' perception of their ability to perform tasks and activities. As a result, individuals tend to engage in activities in which they feel confident, and if individuals feel inadequate about performing an activity, they tend to avoid it. Beliefs about self-efficacy have a direct effect on the amount of energy spent on activities and resistance to obstacles. According to Bandura's theory, self-reflection is one of the unique abilities in humans through which individuals evaluate and change their behavior, and these self-evaluations include perceptions of self-efficacy. Individuals are motivated to perform tasks when the expected outcome is valuable to them, but they will have less readiness to perform tasks when the expected outcomes are not valuable to them. Outcome expectations are associated with efficacy beliefs because these beliefs determine expectations, and since the expected outcome is highly dependent on individuals' judgments of their ability to perform a task, in such cases, if perceptions of self-efficacy are controlled, the expected outcome will undoubtedly play a role in predicting behavior (Zahmatkesh et al., 2018).

Students who use high-level metacognitive strategies learn the material meaningfully. That is, these students connect the material to their prior knowledge in this area and learn the material coherently (not scattered), which leads to a more complete understanding of the information, keeps the material in mind for a longer period, and performs better in exams, ultimately leading to higher academic self-efficacy (Hoseinkhani, Ghasemi, & Hejazi, 2021). The effectiveness of the metacognitive training package on self-efficacy is consistent with the view that direct correction of attentional processing can lead to simultaneous changes in inefficient beliefs. This effect clearly relates to the dynamic cognitive view of psychological disorders. Several mechanisms can form the clinical effectiveness of metacognitive training, including reducing self-focused attention, interrupting worry-based processing strategies and rumination, increasing executive control over processing and attention, and strengthening metacognitive processing strategies. Reducing self-focused attention in emotional disorders probably benefits because it reduces the intensity of perceived emotional and physical responses. The use of attentional approaches such as attention control training shows that such responses are harmless and should be ignored. This approach not only distances attention from its physical and emotional state, but also reduces selective attention to negative thoughts in emotional states (Tavakoli & Ebrahimi, 2020). Metacognitive training has therapeutic effects by interrupting continuous worry-based and rumination processes. Interruption of these processes has benefits (Wells, 2021).

Anxiety and rumination may be associated with maintaining ineffective attention patterns and memory retrieval, resulting in the retention of threat evaluations and negative beliefs. Rumination about incomplete aspects of the individual's current situation may be accompanied by recalling past failures and defeats (Menzies et al., 2021). Therefore, rumination and anxiety-based processes may result in getting stuck in negative processing frameworks that maintain negative beliefs and interpretations. Interrupting constant processing through attention control training eliminates the cyclical processes and frees up attentional capacity for other processing operations that require generating executive control processes, creating potential new information, and updating knowledge. Under such conditions, attention is likely to be more flexible and less restricted to inefficient knowledge patterns. Improved control allows individuals to correct their ineffective knowledge and process potential threatening stimuli without creating inefficient cognitive formations or biased cognitive processes.

Furthermore, in explaining the efficacy of Kabat-Zinn's mindfulness training on general self-efficacy, it could be argued that Kabat-Zinn suggests that negative attitudes and emotions about different situations can only change by observing non-judgmental thoughts and perceiving them only as thoughts (Kabat-Zinn, 2003). Increased self-efficacy occurs through this type of non-judgmental observation that makes the individual feel that they have greater control over their emotional responses and behaviors. High personal efficacy can be accompanied by a decrease in neglect when performing tasks. Mindfulness techniques, by changing cognition and increasing self-acceptance in the individual, will release them from cognitive-behavioral habits that are incompatible and encourage them to accept the current situation (Vidic & Cherup, 2019; Zare & Aghaziarati, 2018). Mindfulness makes the individual focus on the educational content in the present moment in the learning environment, abandon mental distractions and inefficient thoughts that

JARAC Assessment and Research in Applied Counseling
E-ISSN: 2821-2738

would make processing information difficult or impossible, and increase attention concentration to intentionally pursue educational content that leads to purposeful effort towards achieving educational goals, ultimately resulting in academic success. As a result, the individual's sense of competence in relation to their abilities and capacities to perform academic tasks increases and leads to an increase in their academic self-efficacy (Ghanbaritalab, Javanmard, & Rezaei, 2019). Additionally, mindfulness provides the means to create insight into students' emotions, feelings, and the transfer nature of emotions, creating a sense of being effective in shaping their educational lives. Therefore, mindfulness strengthens students' sense of control, leading to an increase in their academic self-efficacy, namely belief in their abilities and capacities to perform academic tasks.

5. Suggestions and Limitations

Due to the fact that the statistical population of this study is a small part of society consisting of female high school students in district 6 of Tehran, during a specific and limited period of time, attention should be paid to the limited and specific nature of the sample when generalizing the results to other individuals in the society. In this study, the only tool used was a questionnaire that may be subject to inaccuracies, impatience or personal biases on the part of the participants. In order to ensure the validity of the results obtained from this study, conducting more extensive research in larger communities and on different genders is recommended to enable comparison between girls and boys. Nuisance variables that affect the results of the research should be considered and controlled for in future studies. As mindful education has had positive results in both preventing psychological damage and treating many mental disorders including stress, anxiety, and depression, and stress is considered an inevitable part of human life in today's progressive society, it is suggested that mindfulness education be provided through group media and with the help of experienced professionals as a universal program. Considering the greater effectiveness of the metacognitive educational package on the academic self-efficacy of students, it is recommended that appropriate curriculum programs be provided for students to meet their metacognitive needs so that they can concentrate on their duties and be less focused on external rewards and encouraging methods from teachers.

Acknowledgments

The cooperation of all participants in the research is thanked and appreciated.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics principles

In this study, ethical considerations such as obtaining full consent from all participants, maintaining confidentiality and secrecy of information, and allowing participants to withdraw from study.

Authors' Contributions

All authors contributed equally.

References

Acmed-Ismael, F. (2021). Metacognitive learning strategies: their effects on the reading comprehension performance of grade five pupils. *International Journal of Linguistics, Literature and Translation*, *4*(5), 107-117. https://doi.org/10.32996/ijllt.2021.4.5.10

Aghaziarati, A., Ashori, M., Norouzi, G., & Hallahan, D. P. (2023). The effectiveness of mindful parenting on cognitive and behavioral emotion regulation in mothers of children with hearing loss. *KAUMS Journal (FEYZ)*, *27*(1), 825-833. http://dx.doi.org/10.48307/FMSJ.2023.27.1.76

Aghaziarati, A., Karevan Brojerdi, K., Bedayat, E., & Asgari, M. (2020). The Relationship between Social Cognition and Academic Performance with The Mediating Role of Cognitive Cognitive Abilities and Academic Emotion in Students. *Education Strategies in Medical Sciences*, *13*(4), 371-381. https://edcbmj.ir/article-1-2079-en.html

Alkan, V. (2018). A systematic review research:'Mathematics anxiety'in Turkey. *International Journal of Assessment Tools in Education*, *5*(3), 567-592. https://doi.org/10.21449/ijate.445919

Anis, Y., Krause, J. A., & Blum, E. N. (2016). The Relations Among Mathematics Anxiety, Gender, and Standardized Test Performance. *Research in the Schools*, *23*(2). https://www.proquest.com/openview/c41d548acde9ad17b957d034534e1c1c/1?pq-origsite=gscholar&cbl=10235

Clements, D. H., Fuson, K. C., & Sarama, J. (2017). The research-based balance in early childhood mathematics: A response to Common Core criticisms. *Early Childhood Research Quarterly*, *40*, 150-162. https://doi.org/10.1016/j.ecresq.2017.03.005

Ganesh, S., Kandasamy, A., Sahayaraj, U. S., & Benegal, V. (2018). Behavioral activation and behavioral inhibition sensitivities in patients with substance use disorders: A study from India. *Indian Journal of Psychiatry*, *60*(3), 346. https://doi.org/psychiatry.IndianJPsychiatry_323_18

JARAC Assessment and Research in Applied Counseling
E-ISSN: 2821-2738

Gbenga-Akanmu, T. O., & Jegede, P. O. (2019). Influence of Meta-Cognitive Training and Cognitive Styles on Numeracy Achievement of Nigerian Pupils' in Computer-Mediated Classrooms. *World Journal of Education*, *9*(1), 221-228. https://doi.org/10.5430/wje.v9n1p221

Ghanbaritalab, M., Javanmard, G., & Rezaei, A. (2019). The relationship between Mindfulness and Attention with Academic Self-efficacy. *Rooyesh-e- Ravanshenasi*, *8*(5). https://frooyesh.ir/article-1-301-fa.html

Habibi, M. (2019). The effectiveness of mindfulness-based stress reduction program training on procrastination and motivation to progress in female students. *8*(11), 57-66. https://frooyesh.ir/article-1-1615-fa.html

Hermita, M., & Thamrin, W. P. (2015). Metacognition toward academic self-efficacy among Indonesian private university scholarship students. *Procedia-Social and Behavioral Sciences*, *171*, 1075-1080. https://doi.org/10.1016/j.sbspro.2015.01.268

Hoseinkhani, K., Ghasemi, M., & Hejazi, M. (2021). The effectiveness of educational package based on cognitive components of critical thinking, problem-solving,and metacognition on students' self-efficacy and academic vitality. *Advances in Cognitive Sciences 23*(4), 48-60. https://doi.org/10.30514/icss.23.4.48

Kabat-Zinn, J. (2003). *Wherever you go, There You Are*. Hyperion.

Menzies, R. E., Zuccala, M., Sharpe, L., & Dar-Nimrod, I. (2021). Are anxiety disorders a pathway to obsessive-compulsive disorder? Different trajectories of OCD and the role of death anxiety. *Nordic journal of psychiatry*, *75*(3), 170-175. https://doi.org/10.1080/08039488.2020.1817554

Mikhak, A., & Moradi, A. (2022). A comparative study of the effectiveness of academic counseling based on subjective academic success factors and objective academic success factors on academic motivation, academic enthusiasm and academic self-efficacy. *Journal of New Advances in Psychology, Training and Education*, *5*(47). https://www.magiran.com/paper/2433971

Motie, H., Heidari, M., Bagherian, F., & Zarani, F. (2019). Providing Mindfulness-Based Educational Package for Evaluating Academic Procrastination. *Psychiatry and Clinical Psychology of Iran*, *25*(1), 26-41. https://www.sid.ir/paper/17091/fa

Parsakia, K., Darbani, S. A., Rostami, M., & Saadati, N. (2022). The effectiveness of strength-based training on students' academic performance. *Journal of Adolescent and Youth Psychological Studies*, *3*(3), 194-201. http://dx.doi.org/10.52547/jspnay.3.3.194

Parsakia, K., Rostami, M., & Saadati, S. M. (2023). Validity and reliability of digital self-efficacy scale in Iranian sample. *Journal of Adolescent and Youth Psychological Studies*, *4*(4), 152-158.

Plake, B. S., & Parker, C. S. (1982). The development and validation of a revised version of the Mathematics Anxiety Rating Scale. *Educational and psychological measurement*, *42*(2), 551-557. https://doi.org/10.1177/001316448204200218

Pouraslan, Y. (2022). The effect of educational management on academic hope and academic self-efficacy among students in schools in Gilan province. *Journal of New Research Approaches in Management and Accounting*, *6*(84).

Safarzadeh, S., & Jayervand, H. (2019). Prediction of Academic Self-efficacy Based on Self-regulated Learning Strategies, Metacognition Strategies And Goal-Progress Orientation In Students. *Rooyesh-e- Ravanshenasi*, *8*(11). http://frooyesh.ir/browse.php?a_code=A-10-1822-1&slc_lang=fa&sid=1

Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R. W. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports*, *51*(2), 663-671. https://doi.org/10.2466/pr0.1982.51.2.663

Tavakoli, O., & Ebrahimi, S. (2020). The effectiveness of mindfulness-based cognitive therapy (MBCT) on academic motivation, self-efficacy and academic procrastination of students. *Journal of new developments in psychology, educational sciences and education*, *3*(28), 27-41. https://www.jonapte.ir/fa/showart-29e7004637e710585a631830db312b50

Tian, Y., Fang, Y., & Li, J. (2018). The effect of metacognitive knowledge on mathematics performance in self-regulated learning framework—multiple mediation of self-efficacy and motivation. *Frontiers in psychology*, *9*, 2518. https://doi.org/10.3389/fpsyg.2018.02518

Vidic, Z., & Cherup, N. (2019). Mindfulness in classroom: Effect of a mindfulness-based relaxation class on college students' stress, resilience, self-efficacy and perfectionism. *College Student Journal*, *53*(1), 130-144. https://psycnet.apa.org/record/2019-17784-013

Wells, A. (2021). *Metacognitive Therapy for Anxiety and Depression*.

Wongsuwan, N., & Na-Nan, K. (2022). Mediating Effects of Self-Efficacy, Resilience and Job Satisfaction on the Relationship between Person–Organisation Fit and Employee Work Adjustment. *Sustainability*, *14*(18), 11787. https://doi.org/10.3390/su141811787

Yagan, S. A. (2022). The Relationship between Metacognitive Awareness and Academic Procrastination Behavior: The Moderator Role of Gender and Grade Level. *International Journal of Contemporary Educational Research*, *9*(3), 532-542. https://doi.org/10.33200/ijcer.1082874

Yousef Vand, M., & Alavi, Z. (2018). The Effectiveness of Cognitive and Metacognitive Strategies (CMST) On Creative Self and Passion for Education in Secondary School Students. *JOURNAL OF INSTRUCTION AND EVALUATION*, *11*(42), 143-159. https://www.sid.ir/paper/183382/en

Zahmatkesh, Y. Z., Dortaj, F., Sobhi Gharamaleki, N., & Kiamanesh, A. R. (2018). The Effectiveness of Mindfulness Training on Increasing Working Memory Capacity and Academic Self-Efficacy of Girl Students. *Research in Educational Systems*, *12*, 13-26. https://www.jiera.ir/?lang=en

Zamfir, A.-M., & Mocanu, C. (2020). Perceived academic self-efficacy among Romanian upper secondary education students. *International journal of environmental research and public health*, *17*(13), 4689. https://doi.org/10.3390/ijerph17134689

Zare, M., & Aghaziarati, A. (2018). Effectiveness of mindfulness training compared to emotion regulation on the compatibility of students with ADHD. *Journal of Applied Psychology*, *12*(2), 203-222. https://dorl.net/dor/20.1001.1.20084331.1397.12.2.3.9

Zhou, M., Lam, K. K. L., & Zhang, Y. (2022). Metacognition and academic procrastination: A meta-analytical examination. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, *40*(2), 334-368. https://doi.org/10.1007/s10942-021-00415-1

Ziegler, N., & Opdenakker, M.-C. (2018). The development of academic procrastination in first-year secondary education students: The link with metacognitive self-regulation, self-efficacy, and effort regulation. *Learning and Individual Differences*, *64*, 71-82. https://doi.org/10.1016/j.lindif.2018.04.009

JARAC Assessment and Research in Applied Counseling
E-ISSN: 2821-2738