



*Analytical paper*

## Meta-analysis of Cognitive and Meta-Cognitive Educational and Therapeutic Interventions on Anxiety

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### Abstract

The current research was conducted with the Meta-analysis method and aimed at combining the research in the field of cognitive and meta-cognitive educational and therapeutic interventions on anxiety. The statistical population was the available research related to cognitive and metacognitive interventions on anxiety, which were available between the years 2006 and 2021 in the computer databases accessible. Based on the defined inclusion and exclusion criteria of primary studies, 67 effect sizes from 63 primary studies were analyzed by CMA software. The size of the total combined effect was evaluated according to the large Cohen's criterion, which indicates the positive effect of various interventions on anxiety. In examining the role of moderating variables, the results showed the favorable effectiveness of therapeutic and educational interventions on types of anxiety. Finally, we can say that Cognitive and meta-cognitive therapeutic-educational interventions are one of the most effective types of interventions in improving all types of anxiety.

**Keywords:** Anxiety, cognitive interventions, metacognitive interventions.

### Introduction

Anxiety refers to a state in which a person worries excessively about the occurrence of a terrible event in the future, leading to feelings of worry, tension, and upset (Hallion, et al., 2019). Research has shown that cognitive and metacognitive therapy has a positive impact on a variety of psychological outcomes, including anxiety and mood symptoms in psychiatric patients (Winter, et al., 2020) and social functioning in psychopathic patients (Selgi, 2022). Various studies conducted in recent years have shown that cognitive and metacognitive training is effective in reducing all types of anxiety, as demonstrated by the studies of Shuai, et al. (2019) and Rafie, et al. (2020). Narimani, et al. (2021) in their study titled "Investigating the Effectiveness of Metacognitive Training on the Anxiety and Resilience of Teenage Girls," found that metacognitive training significantly reduced test anxiety in the experimental group compared to the control group. A meta-analysis was conducted to combine the results of studies investigating the effectiveness of cognitive and metacognitive interventions on anxiety, aiming to resolve existing disagreements in this field. The research questions addressed in this study include: How effective are cognitive and metacognitive interventions in reducing anxiety? Is there an interaction between the effectiveness of these interventions and the gender and age of the subjects? Which type of anxiety is more responsive to cognitive and metacognitive interventions?

## Method

In this study, the meta-analysis method was used in accordance with the objectives and nature of the research. Meta-analysis involves returning primary research results in the form of a quantitative index. To synthesize statistical results from different studies, it is necessary to convert these values into an index with a common scale. Effect size is the most widely used method for combining the results of numerical studies in meta-analyses. The statistical population includes all articles published in scientific research journals, master's theses, and doctoral theses valid in computer databases available in Iran from 2001 to 2021. They are used to studying cognitive and metacognitive interventions using experimental and quasi-experimental methods. After applying the above criteria, 75 studies were identified. Based on the exclusion criteria, 12 studies were excluded, leaving a total of 63 studies with 67 effect sizes that met the necessary scientific and methodological conditions for inclusion in the meta-analysis. During the search for primary research, keywords such as metacognitive therapy, cognitive therapy, cognitive therapies based on the theory of mind, cognitive strategies training, and metacognitive strategies training were used to identify studies related to the concept of the independent variable. Available computer databases in Iran, such as Academic Jihad Scientific Database (SID), National Publications Information Bank (Magiran), Noor Specialized Journals Database (Noor Mags), Comprehensive Portal of Humanities, and Research Institute of Science and Information Technology of Iran (Iran doc) were utilized.

## Tool

In this research, the checklist of research project specifications designed by Mesrabadi (2016) was used to collect information. To analyze the data extracted from the primary research, the J-Hedges effect size was calculated for each study. CMA version 2 and SPSS version 22 software were used to calculate effect sizes and perform subsequent statistical activities related to combining the results.

## Results

Table 1 presents the combined effect size (summary) based on two fixed and random models for the 43 primary effect sizes. The obtained results show that the values of the combined effect size in the fixed model are equal to 1.12, and in the random model, they are equal to 1.21. Both values are statistically significant ( $p < 0.001$ ).

**Table 1. The size of fixed and random combined effects related to the effectiveness of educational and therapeutic interventions based on cognitive and metacognitive strategies on anxiety.**

Model	Number of effect sizes	Summary effect size	95% Confidence Interval		Z-value	Significance level
			Lower limit	Upper limit		
Fixed	43	1.29	1.02	1.23	20.28	0.001
Random	43	1.12	1.04	1.28	13.75	0.001

Table 2 presents the combined effect size of cognitive and metacognitive training and therapeutic interventions by intervention type (educational or therapeutic). The combined effect sizes were 1.10 for the educational intervention and 1.17 for the therapeutic intervention, both significant ( $p < 0.001$ ). The intra-group Q index is 101.57. Within this amount, the Q index ratio between groups equals 0.31 ( $P < 0.05$  and  $df = 1$ ). This result shows that the level of heterogeneity between the two main study groups depending on the type of intervention is 0.36, which is very low. Therefore, the type of intervention cannot be one of the factors causing heterogeneity.

**Table 2. Combined effect sizes of cognitive and metacognitive training and therapeutic interventions based on the type of intervention**

Intervention	Number Effect size	Summary effect size	Standard error	95% confidence interval		Z-value	Significance level
				lower limit	upper limit		
Training	28	1.10	0.06	0.97	1.23	16.7	0.001
Therapeutic	15	1.17	0.10	0.97	1.37	11.50	0.001

## Discussion and Conclusion

The empirical basis confirms the general finding that cognitive and metacognitive interventions have an effect on people's anxiety. Anxiety symptoms are divided into external and internal symptoms. Among the important internal signs are the attention, thoughts, and imagination of the person, while external signs include heart palpitations, pressure drops, sweating, and difficulty breathing. Focusing cognitive and metacognitive interventions on intrapersonal processes helps people change their relationships with their internal states, thoughts, and feelings, leading to a reduction of internal anxiety symptoms. Cognitive interventions are effective in treating anxiety by freeing anxious people from mental preoccupation with threatening thoughts and worries. This is achieved by encouraging people to practice frequently, pay attention to neutral stimuli, and be constantly aware of their body and mind. Slow cognitive methods are effective in reducing students' anxiety. Therefore, anxious students who show negative results in educational evaluation situations are likely to have weaknesses in cognitive activities and a lack of correct and effective use of cognitive strategies.

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### **Conflict of interest**

The authors found no conflict of interest.



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