


# The Relationship Between Mindfulness and Social Anxiety with the Mediating Role of Metacognitive Beliefs in Mothers of Children with Autism and Intellectual Disability

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### ABSTRACT

The aim of the present study was to examine the relationship between mindfulness and social anxiety with the mediating role of metacognitive beliefs in mothers of children with autism and intellectual disability. In terms of purpose, the research was applied, and in terms of data collection, it employed a descriptive correlational design based on structural equation modeling. The statistical population included all mothers of children with autism and intellectual disability in Behshahr County, totaling 618 individuals, from whom 237 participants were selected as the sample based on the Krejcie and Morgan table using convenience sampling. Standardized questionnaires—including the Wells and Cartwright-Hatton Metacognitions Questionnaire (2004) ( $\alpha = 0.79$ ), the Connor et al. Social Anxiety Questionnaire (2000) ( $\alpha = 0.82$ ), and the Baer et al. Mindfulness Questionnaire (2006) ( $\alpha = 0.88$ )—were used as research instruments. For data analysis, descriptive statistics included frequency tables and charts, percentage frequencies, and means; inferential statistics included the Kolmogorov-Smirnov test to assess the normality of variables and correlation coefficients and structural equation modeling to test the research hypotheses, using SPSS 22 and SmartPLS software at a 95% confidence level. The results indicated a significant relationship between mindfulness and social anxiety with the mediating role of metacognitive beliefs in mothers of children with autism and intellectual disability. Additionally, there was a significant negative relationship between mindfulness and metacognitive beliefs with social anxiety in mothers of children with autism and intellectual disability, and a significant negative relationship between mindfulness and metacognitive beliefs in these mothers.

**Keywords:** *Mindfulness, Social Anxiety, Metacognitive Beliefs, Mothers of Children with Autism and Intellectual Disability*

## 1. Introduction

Social anxiety is one of the most prevalent and functionally impairing psychological difficulties, characterized by an intense and persistent fear of social situations in which individuals anticipate negative evaluation, rejection, or humiliation by others. This condition not only affects interpersonal functioning and quality of life but also contributes to long-term emotional distress, maladaptive coping strategies, and reduced psychological well-being. Contemporary psychological research increasingly emphasizes that social anxiety is not merely an individual emotional experience but is embedded within broader cognitive, metacognitive, and contextual processes that shape how individuals interpret, regulate, and respond to social threats (Ghaderi et al., 2022; Strand et al., 2023). Understanding these underlying mechanisms is particularly critical in vulnerable populations who are exposed to chronic stressors and caregiving burdens, such as mothers of children with autism spectrum disorder and intellectual disability.

Mothers of children with autism and intellectual disability face unique and persistent challenges, including elevated caregiving demands, uncertainty about their child's future, social stigma, and reduced access to social support. These stressors place them at heightened risk for psychological problems, including anxiety, depression, emotional exhaustion, and social withdrawal (Kulasinghe et al., 2021; Miranda et al., 2019). Empirical evidence consistently demonstrates that mothers in this group report significantly higher levels of psychological distress and social anxiety compared to mothers of typically developing children (Abdi & Narimani, 2018; Akbari, 2019). Social anxiety in these mothers may manifest as avoidance of social interactions, fear of judgment related to their child's condition, and heightened sensitivity to perceived criticism, which in turn can exacerbate isolation and reduce adaptive coping resources (Hallajani et al., 2019; Porter et al., 2017).

Recent theoretical and empirical developments suggest that social anxiety is strongly influenced by cognitive and metacognitive processes, particularly maladaptive beliefs about thoughts, emotions, and social evaluation. Metacognitive beliefs, including rigid assumptions about personal inadequacy, uncontrollability of anxiety, and catastrophic interpretations of social situations, play a central role in the maintenance of social anxiety (Ghazanfari & Naderi, 2019; Ronchi et al., 2019). Metacognitive models further propose that beliefs about thinking itself—such as

beliefs about the danger of worry, the need to control thoughts, or low confidence in cognitive functioning—intensify self-focused attention and emotional dysregulation, thereby sustaining anxiety symptoms (Solem & Wells, 2015; Strand et al., 2023). In mothers of children with autism, these maladaptive belief systems may be reinforced by repeated exposure to stressful caregiving experiences and perceived social scrutiny (Hossein Zadeh et al., 2016; Kulasinghe et al., 2021).

Within this framework, mindfulness has emerged as a key protective psychological construct that may counteract the detrimental effects of maladaptive cognitive and metacognitive beliefs. Mindfulness refers to a nonjudgmental, present-moment awareness of internal experiences, including thoughts, emotions, and bodily sensations, and is associated with enhanced emotional regulation, cognitive flexibility, and psychological resilience (Jazaieri et al., 2016; Solem & Wells, 2015). A growing body of research indicates that higher levels of mindfulness are associated with lower levels of social anxiety, reduced rumination, and more adaptive coping strategies (Öztekin, 2024; Tarman & Sari, 2021). In both clinical and nonclinical populations, mindfulness has been shown to weaken the impact of negative self-evaluation and fear of social judgment by promoting acceptance rather than avoidance of internal experiences (Aghapour & Najati, 2019; Hazrati & Abdi, 2024).

Importantly, mindfulness appears to exert its beneficial effects not only directly but also indirectly through modifying maladaptive cognitive and metacognitive beliefs. Studies suggest that mindfulness training reduces dysfunctional beliefs about worry, threat, and self-control, thereby decreasing vulnerability to anxiety disorders (Ghadampour et al., 2016; Rabat Mili & Karimi, 2018). From a metacognitive perspective, mindfulness fosters a decentered relationship with thoughts, enabling individuals to experience thoughts as transient mental events rather than accurate reflections of reality, which is particularly relevant for individuals with social anxiety (Solem & Wells, 2015; Strand et al., 2023). This mechanism is supported by evidence showing that mindfulness mediates the relationship between maladaptive beliefs and social anxiety symptoms (Heydari et al., 2018; Tarman & Sari, 2021).

In the context of mothers of children with autism and intellectual disability, mindfulness may play a crucial role in buffering the psychological impact of caregiving stress. Research demonstrates that mindfulness is associated with improved psychological well-being, greater resilience, and

more effective coping strategies in this population (Hoshyar et al., 2018; Hossein Zadeh et al., 2016). Interventions grounded in mindfulness and acceptance-based approaches have been shown to reduce anxiety, emotional distress, and maladaptive beliefs in mothers of children with autism (Al Behbahani et al., 2021; Amini Fashkhodi et al., 2019; Tamimi et al., 2020). These findings suggest that mindfulness may serve as a central psychological resource that mitigates the influence of dysfunctional belief systems on social anxiety.

Despite the growing literature on mindfulness, metacognitive beliefs, and social anxiety, several gaps remain. First, much of the existing research has focused on adolescents, students, or general clinical populations, with limited attention to mothers of children with autism and intellectual disability as a distinct and vulnerable group (Kuçukparlak, 2021; Talha et al., 2020). Second, although studies have examined pairwise relationships between mindfulness and social anxiety or between metacognitive beliefs and anxiety, fewer studies have tested integrated models that simultaneously consider mindfulness, metacognitive beliefs, and social anxiety within a mediational framework (Ghaderi et al., 2022; Strand et al., 2023). Third, cultural context is an important but often overlooked factor, as beliefs about parenting, social evaluation, and emotional expression may shape the experience of anxiety and mindfulness differently across societies (Taheri, 2025; Talebi, 2020).

Addressing these gaps is essential for developing theoretically grounded and culturally sensitive interventions aimed at improving the mental health of mothers caring for children with autism and intellectual disability. By examining the interplay between mindfulness, metacognitive beliefs, and social anxiety, researchers can gain a deeper understanding of the mechanisms through which psychological distress is maintained or alleviated in this population. Such insights are critical not only for advancing theory but also for informing prevention and intervention programs that target modifiable psychological processes rather than symptoms alone (Bagheri et al., 2024; Hazrati & Abdi, 2024).

Accordingly, the present study seeks to contribute to the existing literature by testing a structural model that examines the relationship between mindfulness and social anxiety with the mediating role of metacognitive beliefs in mothers of children with autism and intellectual disability.

## 2. Methods and Materials

### 2.1. Study Design and Participants

The present study is applied in terms of purpose and, in terms of setting and data collection, employs a descriptive correlational research design. The statistical population of the study included all mothers of children with autism and intellectual disability in Behshahr County, which, according to statistics obtained from the Behshahr County Welfare Organization in 2024, comprised 618 individuals. Based on the Krejcie and Morgan table, a sample of 237 participants was selected using convenience sampling.

### 2.2. Measures

**Metacognitive Beliefs (MCQ-30):** This instrument, developed by Wells and Cartwright-Hatton (2004), assesses individuals' beliefs and cognitive processes regarding the evaluation, monitoring, or control of their own thoughts. It consists of 30 self-report items measuring metacognitive domains across five distinct dimensions: (1) positive beliefs about worry, (2) uncontrollability and danger, (3) cognitive confidence, (4) need to control thoughts, and (5) cognitive self-consciousness. Each dimension is assessed with six items, and all items are rated on a Likert scale ranging from "strongly disagree" (1) to "strongly agree" (4). Wells and Cartwright-Hatton (2004) reported Cronbach's alpha coefficients for the subscales ranging from 0.72 to 0.93, and test-retest reliability over intervals of 22 to 118 days of 0.75. In Iran, Shirin-Zadeh Dastgiri et al. reported internal consistency coefficients based on Cronbach's alpha of 0.91 for the total questionnaire and between 0.71 and 0.87 for the subscales.

**Social Anxiety:** This questionnaire was developed by Connor et al. (2000) to assess social anxiety. It is a 17-item self-report measure comprising three subscales: fear (6 items), avoidance (7 items), and physiological discomfort (4 items). Each item is rated on a five-point Likert scale ranging from 0 (not at all) to 4 (extremely), yielding total scores from 0 to 68. A cutoff score of 40 differentiates individuals with social phobia from nonclinical individuals with a diagnostic accuracy of 80%, while a cutoff score of 50 yields an accuracy of 89%. In the study by Hasanvand et al. (2010) conducted on a nonclinical Iranian sample, Cronbach's alpha coefficients were 0.82 for the first half of the test and 0.76 for the second half, with a split-half correlation of 0.84 and a Spearman-Brown coefficient of 0.91. Additionally, Cronbach's alpha coefficients for the social anxiety

subscales were 0.75 for avoidance, 0.74 for fear, and 0.75 for physiological discomfort. Psychometric properties of this questionnaire indicate test–retest reliability coefficients ranging from 0.87 to 0.89 in groups diagnosed with social anxiety disorder, and an internal consistency (alpha) coefficient of 0.94 for the total scale in nonclinical samples. A cutoff score of 15 differentiates individuals with social anxiety disorder from nonpsychiatric control groups with a diagnostic efficiency of 0.78, and a cutoff score of 16 differentiates individuals with social anxiety disorder from psychiatric control groups without social anxiety with an efficiency of 0.80 (Connor et al., 2000). In Iran, Abdi et al. (2005) were the first to translate and adapt this questionnaire, reporting high content and face validity and a test–retest reliability coefficient of 0.86 using Pearson’s correlation.

**Mindfulness:** This is a 39-item questionnaire developed by Baer et al. (2006) through the integration of items from the Freiburg Mindfulness Inventory and the Mindful Attention Awareness Scale using an advanced factor-analytic approach. The questionnaire consists of 39 items and five components: observing (items 1, 6, 11, 15, 20, 26, 31, 36), describing (items 2, 7, 12, 16, 22, 27, 32, 37), acting with awareness (items 5, 8, 13, 18, 23, 28, 34, 38), nonjudging of inner experience (items 3, 10, 14, 17, 25, 30, 35, 39), and nonreactivity to inner experience (items 4, 9, 19, 21, 24, 29, 33). Scoring is based on a five-point Likert scale ranging from “never or very rarely true” (1) to “very often or always true” (5). Results indicate satisfactory internal consistency for the factors, with Cronbach’s alpha

coefficients ranging from 0.75 to 0.91, and an overall Cronbach’s alpha of 0.83. In Iran, Kord et al. (2015) reported a reliability coefficient of 0.86 for this construct.

### 2.3. Data Analysis

To analyze the data, both descriptive and inferential statistics were used. In the descriptive statistics section, frequency indices, percentages, means, and standard deviations were employed to describe the study variables. In the inferential statistics section, considering the research objectives and the measurement scales used, the Kolmogorov–Smirnov test was applied to assess the normality of the variables, and Pearson’s correlation coefficient was used to test the research hypotheses using SPSS version 22 at a 95% confidence level. Structural equation modeling was conducted using SmartPLS software.

## 3. Findings and Results

The findings obtained from the descriptive analysis of the variables are presented in Table 1. As shown in the table above, the mean and standard deviation of social anxiety were  $30.28 \pm 2.04$ , the mean and standard deviation of mindfulness were  $91.48 \pm 4.00$ , and the mean and standard deviation of metacognitive beliefs were  $104.92 \pm 3.44$ .

In addition, the values obtained for skewness and kurtosis were within the range of  $-2$  to  $+2$ . Therefore, the distributions of the variables were neither skewed nor kurtotic.

**Table 1**

*Descriptive Indices of the Study Variables*

Variables	N	Mean	Standard Deviation	Minimum	Maximum	Skewness	Kurtosis
Social Anxiety	237	30.28	2.04	24	32	−0.58	−0.10
Mindfulness	237	91.48	4.00	82	100	−0.26	0.39
Metacognitive Beliefs	237	104.92	3.44	96	111	−0.53	−0.19

To examine the normality of the data, the Kolmogorov–Smirnov test was used, and the results are presented below.

H<sub>0</sub>: The data are normally distributed.

H<sub>1</sub>: The data are not normally distributed.

**Table 2**

*Assessment of the Normality of Data Distribution*

Variables	Kolmogorov–Smirnov Z	Significance Level	Test Result
Social Anxiety	0.65	0.046	Data distribution is not normal
Mindfulness	0.82	0.031	Data distribution is not normal
Metacognitive Beliefs	0.92	0.024	Data distribution is not normal

Based on Table 2, variables with significance levels greater than 0.05 are normally distributed ( $H_0$  accepted and  $H_1$  rejected), whereas variables with significance levels less than 0.05 are non-normally distributed ( $H_1$  accepted and  $H_0$  rejected). When data are normally distributed, the use of parametric tests is permitted; when data are not normally distributed, parametric tests are not appropriate and nonparametric tests should be used. According to Table 2, the significance levels of all variables in this study (social

anxiety, mindfulness, and metacognitive beliefs) were less than 0.05. Therefore, the data distributions were non-normal, and nonparametric tests were applied.

The results indicated that the factor loadings, average variance extracted (AVE), Cronbach's alpha, and composite reliability values were all above the minimum acceptable thresholds (Table 3). Accordingly, the reliability and validity of the instruments were confirmed.

**Table 3**

*Cronbach's Alpha Coefficients, Composite Reliability, and AVE Values for the Questionnaires*

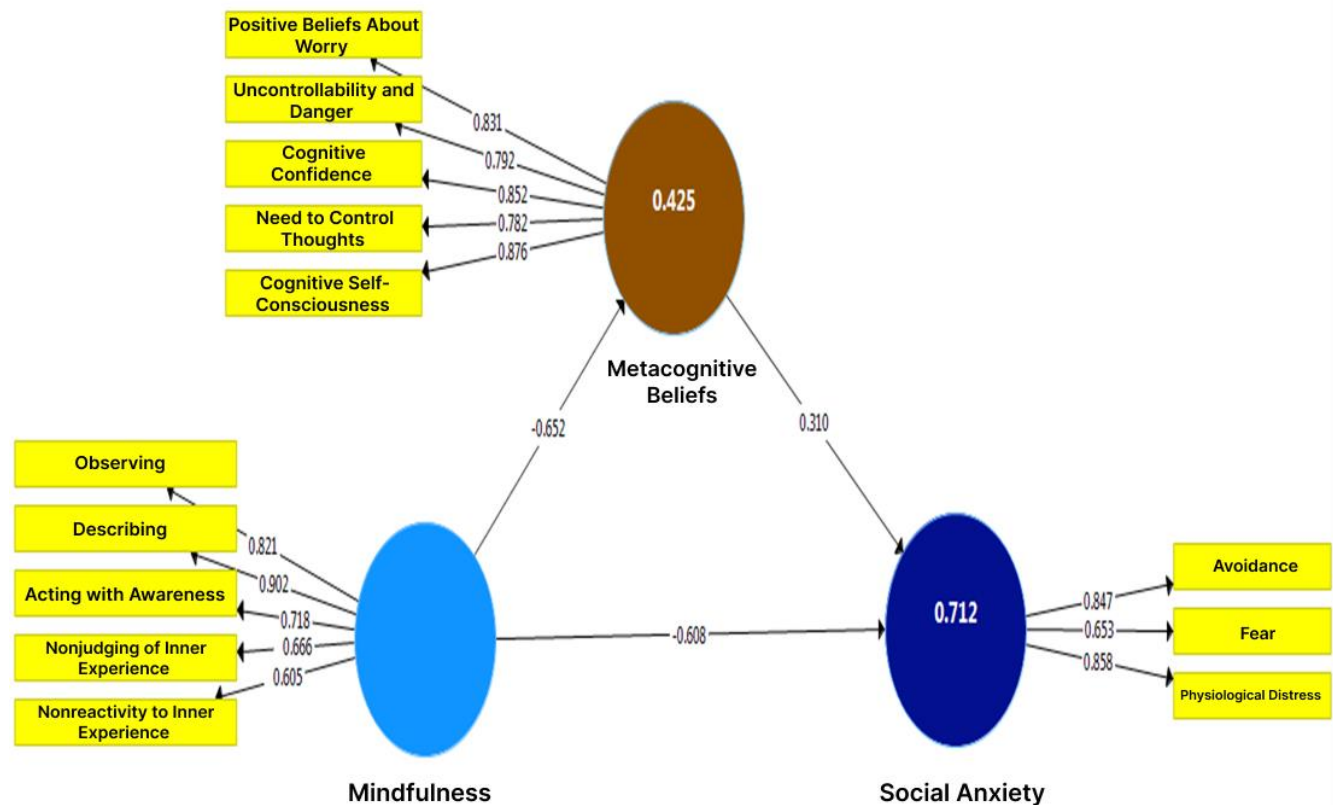
Variables	Cronbach's Alpha ( $\alpha > 0.70$ )	Composite Reliability (CR $> 0.70$ )	AVE ( $> 0.50$ )
Social Anxiety	0.791	0.832	0.627
Metacognitive Beliefs	0.885	0.916	0.685
Mindfulness	0.831	0.985	0.563

Figure 1 illustrates the measurement model. The values on the paths indicate the strength of the relationships among the constructs in the model. As indicated by the results, none of the items had factor loadings below 0.40, and the AVE values for all variables exceeded the acceptable threshold of

0.50. Moreover, the square root of the AVE for each construct was greater than its correlations with other constructs, indicating the confirmation of discriminant validity (Table 4).

**Figure 1**

*Conceptual Visualization of the Multimodal Deep Learning Framework for Detecting Anxiety and Perfectionism Patterns*





**Table 4**

*Discriminant Validity Results Using the Fornell–Larcker Criterion*

Research Variables	Social Anxiety	Metacognitive Beliefs	Mindfulness
Social Anxiety	0.792		
Metacognitive Beliefs	0.707	0.827	
Mindfulness	−0.811	−0.652	0.750

After conducting confirmatory factor analysis, the structural model was evaluated. According to Table 5, the coefficients of determination ( $R^2$ ) for social anxiety and metacognitive beliefs were 0.712 and 0.425, respectively, with a mean value of 0.5685. In addition, the communalities for mindfulness, social anxiety, and metacognitive beliefs

were 0.349, 0.268, and 0.501, respectively, with a mean value of 0.3727. Therefore, the goodness-of-fit (GOF) index of the model was calculated as follows:

$$GOF = \sqrt{0.3727 \times 0.5682} = 0.4601$$

**Table 5**

*Overall Model Fit Results Based on the GOF Criterion*

Variables	Communality	$R^2$	GOF
Mindfulness	0.349	—	0.4601
Social Anxiety	0.268	0.712	
Metacognitive Beliefs	0.501	0.425	

Given that the GOF value was 0.4601, which exceeds the threshold of 0.36, the overall fit of the research model is

considered strong. Therefore, it can be concluded that the overall fit of the proposed model is highly satisfactory.

**Table 6**

*Testing the Main Research Hypothesis*

Path	Direct Effect	Indirect Effect	Total Effect	t-value	Sobel Test	Significance Level	Result
Mindfulness → Metacognitive Beliefs	−0.652	—	—	9.594	—	0.000	Confirmed
Mindfulness → Social Anxiety	−0.608	—	—	5.315	—	0.000	Confirmed
Metacognitive Beliefs → Social Anxiety	0.310	—	—	2.591	—	0.013	Confirmed
Mindfulness → Metacognitive Beliefs → Social Anxiety	−0.608	−0.202	−0.810	2.431	2.494	0.028	Confirmed

As shown in Table 6, the direct effect of mindfulness on metacognitive beliefs (path coefficient = −0.652,  $t = 9.594$ ), the direct effect of mindfulness on social anxiety (path coefficient = −0.608,  $t = 5.315$ ), and the direct effect of metacognitive beliefs on social anxiety (path coefficient = 0.310,  $t = 2.591$ ) were all statistically significant, confirming the mutual effects of the variables. The total effect coefficient of mindfulness on social anxiety with the mediating role of metacognitive beliefs was −0.810, indicating that the mediating role of metacognitive beliefs in the relationship between mindfulness and social anxiety was

significant. Moreover, given that the absolute value of the Sobel test statistic (2.494) exceeded 1.96 and the significance level (0.000) was less than 0.05, the mediating effect of metacognitive beliefs in the relationship between mindfulness and social anxiety was confirmed at the 95% confidence level. Accordingly, the main hypothesis of the study was supported. Therefore, it can be concluded that there is a significant relationship between mindfulness and social anxiety with the mediating role of metacognitive beliefs in mothers of children with autism and intellectual disability.

**Table 7**

*Spearman Correlation Results among Mindfulness, Metacognitive Beliefs, and Social Anxiety in Mothers of Children with Autism and Intellectual Disability (N = 237)*

Hypothesis	Variable Pair	Spearman's $\rho$	Significance (Sig.)	Direction of Relationship	Result
H1	Mindfulness – Social Anxiety	–0.722**	0.000	Negative	Supported
H2	Mindfulness – Metacognitive Beliefs	–0.585**	0.000	Negative	Supported
H3	Metacognitive Beliefs – Social Anxiety	0.712**	0.000	Positive	Supported

\*\*p < .01; \*p < .05.

Based on the results presented in Table 7, all three research hypotheses were statistically supported at the 95% confidence level. The Spearman correlation analysis showed a strong and significant negative relationship between mindfulness and social anxiety ( $\rho = -0.722$ ,  $p < .01$ ), indicating that higher levels of mindfulness are associated with lower levels of social anxiety in mothers of children with autism and intellectual disability. In addition, a significant negative relationship was observed between mindfulness and metacognitive beliefs ( $\rho = -0.585$ ,  $p < .01$ ), suggesting that increases in mindfulness are accompanied by reductions in maladaptive metacognitive beliefs. Conversely, the relationship between metacognitive beliefs and social anxiety was positive and significant ( $\rho = 0.712$ ,  $p < .01$ ), demonstrating that stronger maladaptive metacognitive beliefs are associated with higher levels of social anxiety. Collectively, these findings indicate that mindfulness functions as a protective factor against both maladaptive metacognitive beliefs and social anxiety, while metacognitive beliefs play a risk-enhancing role in the experience of social anxiety among this population.

#### 4. Discussion

The present study examined the structural relationships among mindfulness, metacognitive beliefs, and social anxiety in mothers of children with autism and intellectual disability, with particular attention to the mediating role of metacognitive beliefs. The findings demonstrated three central results: first, mindfulness was significantly and negatively associated with social anxiety; second, mindfulness was significantly and negatively associated with metacognitive beliefs; and third, metacognitive beliefs were significantly and positively associated with social anxiety. Moreover, the mediational analysis confirmed that metacognitive beliefs partially mediated the relationship between mindfulness and social anxiety. Taken together, these results provide robust empirical support for integrative

cognitive–metacognitive models of social anxiety and extend their applicability to a highly vulnerable caregiving population.

The observed negative association between mindfulness and social anxiety is consistent with a substantial body of prior research indicating that greater mindfulness is linked to lower levels of social fear, avoidance, and physiological distress. Mindfulness facilitates present-moment awareness and nonjudgmental acceptance of internal experiences, thereby reducing self-focused attention and catastrophic interpretations of social situations, which are core mechanisms underlying social anxiety (Jazaieri et al., 2016; Tarman & Sari, 2021). In the context of mothers of children with autism and intellectual disability, heightened mindfulness may enable more adaptive engagement with socially stressful situations, such as interactions with educators, healthcare providers, and the broader community, where fear of negative evaluation is often pronounced. Similar inverse relationships between mindfulness and social anxiety have been reported in adolescents, students, athletes, and clinical samples, suggesting that the protective role of mindfulness is robust across populations (Aghapour & Najati, 2019; Öztekin, 2024; Taheri, 2025). The present findings extend this evidence by demonstrating that mindfulness is equally relevant in a caregiving context characterized by chronic stress and social stigma.

The significant negative relationship between mindfulness and metacognitive beliefs provides further insight into the mechanisms through which mindfulness exerts its effects. Cognitive and metacognitive beliefs—such as beliefs about the uncontrollability of worry, the danger of thoughts, or the necessity of controlling internal experiences—are central to the persistence of anxiety disorders (Solem & Wells, 2015; Strand et al., 2023). The current findings suggest that higher levels of mindfulness are associated with weaker maladaptive metacognitive beliefs in mothers of children with autism and intellectual disability. This is theoretically coherent, as mindfulness promotes a

decentered stance toward thoughts, allowing individuals to observe cognitive events without automatically endorsing them as accurate or threatening (Solem & Wells, 2015). Empirical studies have similarly shown that mindfulness-based interventions reduce dysfunctional beliefs and improve metacognitive functioning in individuals with social anxiety and comorbid emotional problems (Ghadampour et al., 2016; Rabat Mili & Karimi, 2018). In caregiving mothers, mindfulness may attenuate rigid belief systems shaped by repeated exposure to stress, uncertainty, and perceived social judgment, thereby fostering greater psychological flexibility (Hossein Zadeh et al., 2016; Kulasinghe et al., 2021).

The positive and significant association between metacognitive beliefs and social anxiety observed in this study aligns closely with cognitive and metacognitive theories of anxiety. According to these models, maladaptive beliefs amplify threat perception, increase self-monitoring, and maintain avoidance behaviors, all of which are hallmark features of social anxiety (Ghaderi et al., 2022; Ghazanfari & Naderi, 2019). The finding that stronger maladaptive metacognitive beliefs are associated with higher levels of social anxiety in mothers of children with autism and intellectual disability is particularly noteworthy, as it underscores the role of internal belief systems in shaping emotional responses to social stressors beyond the objective challenges of caregiving. Prior studies have documented similar patterns in adolescents and adults, showing that metacognitive beliefs predict social anxiety severity and interpersonal difficulties (Asghari, 2017; Ronchi et al., 2019; Strand et al., 2023). The present study extends this evidence to a population that has been relatively underrepresented in structural and mediational research.

The most theoretically significant finding of the study is the confirmation of the mediating role of metacognitive beliefs in the relationship between mindfulness and social anxiety. This result suggests that mindfulness reduces social anxiety not only through direct emotional regulation processes but also indirectly by weakening maladaptive metacognitive beliefs. In other words, mindfulness appears to alter how mothers interpret and relate to their thoughts, which in turn reduces anxiety in social contexts. This mediational pattern is consistent with prior research demonstrating that cognitive and metacognitive variables mediate the effects of mindfulness on anxiety-related outcomes (Heydari et al., 2018; Tarman & Sari, 2021). From a metacognitive perspective, mindfulness disrupts the cognitive-attentional syndrome characterized by worry,

rumination, and threat monitoring, thereby reducing the influence of dysfunctional beliefs on emotional distress (Solem & Wells, 2015). In mothers of children with autism, this process may be particularly important, as caregiving stress can reinforce beliefs about personal inadequacy, lack of control, and social rejection (Abdi & Narimani, 2018; Miranda et al., 2019).

These findings also resonate with intervention-based studies demonstrating the effectiveness of mindfulness-based and acceptance-oriented therapies in reducing anxiety and psychological distress among mothers of children with autism. Programs grounded in mindfulness and acceptance have been shown to decrease anxiety, improve coping, and enhance psychological well-being in this population (Al Behbahani et al., 2021; Amini Fashkhodi et al., 2019; Tamimi et al., 2020). The current study complements this intervention literature by providing a structural explanation for why such approaches may be effective: by targeting maladaptive metacognitive beliefs, mindfulness reduces the cognitive vulnerability underlying social anxiety. This is consistent with findings from broader populations indicating that mindfulness-based cognitive therapy and related approaches reduce anxiety by modifying dysfunctional belief systems (Bagheri et al., 2024; Hazrati & Abdi, 2024; Talebi, 2020).

Cultural and contextual considerations further enhance the interpretation of the results. In many societies, including collectivistic cultural contexts, mothers of children with autism may experience heightened social scrutiny, blame, or stigma, which can intensify maladaptive beliefs about social evaluation and personal responsibility. The strong associations observed in this study suggest that mindfulness may function as a culturally adaptable psychological resource that mitigates the internalization of social stigma and reduces anxiety through cognitive flexibility rather than direct confrontation of stressors (Kuçukparlak, 2021; Talha et al., 2020). By fostering acceptance and present-moment awareness, mindfulness may enable mothers to engage more adaptively with social environments that are perceived as threatening or judgmental.

## 5. Conclusion

Overall, the findings of the present study provide compelling support for an integrative model in which mindfulness acts as a protective factor against social anxiety both directly and indirectly through metacognitive beliefs. This model advances existing literature by simultaneously



incorporating mindfulness, metacognitive beliefs, and social anxiety within a single structural framework and by focusing on mothers of children with autism and intellectual disability, a group that faces distinctive psychological challenges. The results underscore the importance of addressing belief systems and metacognitive processes in interventions aimed at reducing social anxiety in caregiving populations and contribute to a growing body of evidence supporting mindfulness-based approaches as theoretically grounded and empirically effective.

Despite the strengths of the present study, several limitations should be acknowledged. First, the cross-sectional design precludes causal inferences, and the observed relationships should be interpreted as associative rather than directional. Second, data were collected using self-report measures, which may be subject to response biases such as social desirability or common method variance. Third, the use of convenience sampling limits the generalizability of the findings to all mothers of children with autism and intellectual disability. Finally, potential contextual variables such as socioeconomic status, severity of the child's condition, and availability of social support were not explicitly controlled.

Future studies should employ longitudinal or experimental designs to clarify the causal pathways among mindfulness, metacognitive beliefs, and social anxiety. Expanding the research to include fathers and other caregivers would provide a more comprehensive understanding of family dynamics. Additionally, future research could examine the moderating role of cultural factors, social stigma, and caregiving burden, as well as compare different therapeutic approaches targeting mindfulness and metacognitive beliefs.

From a practical perspective, the findings highlight the importance of incorporating mindfulness-based and belief-focused components into psychological support programs for mothers of children with autism and intellectual disability. Mental health professionals should prioritize interventions that enhance present-moment awareness and reduce maladaptive beliefs, while policymakers and service providers should facilitate access to such programs within community and healthcare settings to promote caregivers' psychological well-being.

#### Authors' Contributions

Authors equally contributed to this article.

#### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

#### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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#### Declaration of Interest

The authors report no conflict of interest.

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#### Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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