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Predicting Symptoms of Obsessive-Compulsive Disorder Based on Cognitive Beliefs and Mindfulness in a Non-clinical Population

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A B S T R A C T

Objective: Obsessive-compulsive disorder (OCD) is one of the most common, controversial, and challenging disorders among the various psychological disorders. This research aimed to predict symptoms of OCD based on cognitive beliefs and mindfulness in a non-clinical population.

Materials and Methods: The research design was descriptive-correlational. The statistical population comprised all students from universities in the city of Tabriz. A sample of 500 individuals was selected through convenience sampling. Research tools included the Revised Obsessive-Compulsive Questionnaire, Mindfulness Scale, and Obsessive Beliefs Questionnaire. Pearson correlation coefficient and multiple regression were used to analyze the research hypotheses. Data analysis was performed using SPSS software, version 25.

Findings: Statistical analysis results showed that the combination of cognitive beliefs and mindfulness could predict symptoms of washing, obsessive symptoms, hoarding symptoms, ordering symptoms, checking symptoms, and neutralizing symptoms of OCD ($p < 0.05$).

Conclusion: Based on the results, it can be inferred that professionals can utilize the potential of the variables studied in the areas of diagnosis and clinical interventions for OCD.

Keywords: *Cognitive beliefs, Mindfulness, Symptoms of obsessive-compulsive disorder*

1. Introduction

Obsessive-compulsive disorder (OCD) is a chronic and debilitating illness characterized by obsessions, compulsions, or both. Obsessions include recurrent and intrusive thoughts, impulses, and mental images, while compulsions are repetitive overt behaviors (such as hand-washing, orderliness, checking) or mental acts (like counting, praying, silently repeating words) that an individual feels compelled to perform in response to an obsession or according to rules that must be applied rigidly (Association, 2013). According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, OCD is considered a distinct category, causing significant interpersonal, occupational, and life disruptions, and imposing substantial economic and social costs on individuals and society (Abhijit & Soumen, 2020; Benatti et al., 2020). The lifetime prevalence of OCD in the general population is approximately 1 to 3 percent (Association, 2013). OCD can hinder quality of life and social functioning,

causing serious harm to individuals and their families (Storch et al., 2019).

Research in the field of cognitive psychopathology of OCD has focused on factors and correlates influencing OCD within cognitive models to better identify symptoms of this disorder (Clark, 2006; Fergus & Wu, 2010; Krebs & Heyman, 2015; O'Neill & Feusner, 2015; Wells, 1999). Among these factors are dysfunctional beliefs (Nejati, 2010). Several studies, including those by experts working on the structures of obsessive-compulsive thoughts and actions (Group, 1997), have mentioned the importance of beliefs about the significance of thoughts and thought control in OCD patients (Clark & Purdon, 1997). Cognitive theories on OCD emphasize the role of various cognitive beliefs and their interrelations as the primary cognitive factors in symptom manifestation. Salkovskis (Salkovskis, 1989) posits that the central cognitive factor in OCD is the excessive sense of responsibility one feels towards intrusive thoughts, leading to neutralizing activities (compulsions) and being directly linked to obsessive symptoms (Fava et al., 2014). Rachman's theory (Rachman, 1997) places greater emphasis on thought-action fusion. He believes thought-action fusion increases perceived responsibility, leading to compulsions to alleviate them. According to Rachman's cognitive model (Rachman, 2003), excessive responsibility stems from thought/action fusion. Overvaluation of the importance and responsibility associated with intrusive thoughts leads to the use of thought control strategies, which in turn exacerbates obsessive thoughts (Belloch et al., 2010). Excessive responsibility can also enhance the need for perfectionism and control over unwanted thoughts. Consequently, responsibility beliefs mediate cognitive beliefs related to thought control and perfectionism with obsessive symptoms (Taylor et al., 2010). Behavioral-cognitive models of OCD state that unsuccessful attempts to control unwanted thoughts play a decisive role in the formation and persistence of the disorder (Belloch et al., 2010). Success and failure in controlling these thoughts can be associated with several variables. For instance, accepting an intrusive thought, or in other words, mindful confrontation, eliminates hypervigilance and suppression, allowing individuals to test beliefs maintained due to internal anxiety states. Similarly, accepting uncertainty can reduce the need for worrying about finding perfectionist solutions (Leahy, 2002).

Various studies have reported the effectiveness of mindfulness in OCD symptoms (Hanstede et al., 2008; Hertenstein et al., 2012; Hosein Esfand Zad et al., 2017; Twohig et al., 2006). Mindfulness is defined as "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Hanstede et al., 2008; Moore & Malinowski, 2009). Mindfulness enables a fundamentally different relationship with internal feelings and external events through moment-to-moment awareness and behavior orientation based on rational responsibility instead of automatic reactivity. Employing higher mental functions like attention, awareness, kindness, curiosity, and compassion, mindfulness can effectively control emotional responses through cortical inhibition of the limbic system (Kabat-Zinn, 2003). Thus, individuals with higher levels of mindfulness exhibit fewer self-generated negative thoughts and believe they can free themselves from such thoughts (Frewen et al., 2008). Utilizing mindfulness can employ metacognitive processing and increase flexibility in response to threats (Toneatto, 2002). Mangal (2013) reported the relationship between mindfulness and OCD symptoms in a non-clinical population (Mangal, 2013). Bakes (2015) found a significant negative correlation between mindfulness and obsessive-compulsive symptoms (Bakes, 2015). Sarawgi, Oglesby, and Cougle (2013) in their research found that individuals scoring high on intolerance of uncertainty scales also reported more obsessive symptoms, and intolerance of uncertainty significantly related to symptoms of cleanliness, checking, and orderliness (Sarawgi et al., 2013). Kim and colleagues (2016) found in their study on clinical samples with varying symptom severity that responsibility feelings significantly correlated with moderate-level OCD symptoms, whereas the importance and control of thoughts were significantly related to all levels of OCD symptom severity, and beliefs about certainty and perfectionism were not specifically related to obsessive symptoms (Kim et al., 2016). Leeuwerik and colleagues (2020) investigated the relationship between mindfulness characteristics and self-compassion with symptoms of obsessive-compulsive disorder in a large survey with adults seeking treatment. Their research found a significant relationship between mindfulness, self-compassion, obsessive-compulsive beliefs, and psychological distress in the clinical sample. Mindfulness and self-compassion were unique predictors of OCD symptoms and regulated the severity of depression (Leeuwerik et al., 2020).

Obsessions or compulsions are extremely time-consuming, and the associated problems cause significant disturbances in interpersonal, social, occupational, and other important functional areas. Therefore, OCD is considered a

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serious mental health issue, imposing staggering economic costs annually on the individual, family, and society. This highlights the importance and necessity of identifying variables related to and influencing OCD symptoms. Furthermore, one of the promising approaches in overcoming the central disorder in traditional psychopathology research is implementing preventive programs that target common risk factors among psychological disorders to prevent and improve a wide range of mental health problems within a unified program. Thus, identifying these common factors is of special importance and can significantly aid mental health professionals in providing appropriate solutions for enhancing mental health, especially in individuals with OCD symptoms. Therefore, the current research aims to answer whether cognitive beliefs and mindfulness can predict OCD symptoms in a non-clinical population.

2. Methods and Materials

2.1. Study Design and Participants

The design of the study was descriptive-correlational. The statistical population of the study consisted of all students (both female and male) from universities in the city of Tabriz (including Tabriz Azad University, Tabriz University, and Shahid Madani University). A sample size of 200 to 450 is suggested for correlational research. In this study, a sample of 500 individuals (considering a potential 10% dropout rate) was used, employing a convenience sampling method. The questionnaires were administered individually.

2.2. Measures

2.2.1. OCD

Revised Obsessive-Compulsive Questionnaire is self-report scale is used to assess the severity of obsessive-compulsive symptoms in both clinical and non-clinical populations. It consists of 18 questions, scored on a five-point scale from 0 to 4. The questionnaire includes six subscales: washing, obsessive thoughts, hoarding, ordering, checking, and neutralizing. Each subscale is represented by three questions. Internal consistency for the entire scale has been reported as 0.81 in the OCD group and 0.93 in the generalized anxiety disorder group (Foa et al., 1984). The internal consistency of the subscales is also high, ranging from 0.34 to 0.93 for various groups. The correlation between subscales ranges from 0.31 to 0.57. The internal consistency of the Persian version of the scale is reported as 0.85 (Mohammadi et al., 2009).

2.2.2. Mindfulness

Mindfulness Assessment Scale (MASS) is designed by Brown and Ryan and includes 15 items scored on a six-point Likert scale (almost always = 1, very much = 2, moderately = 3, a little = 4, very little = 5, almost never = 6). The minimum score is 15 and the maximum is 90, with higher scores indicating greater mindfulness. Internal consistency of this scale has been reported between 0.82 and 0.87 using Cronbach's alpha. Nejat et al. (2020), in a study with 350 students from Tehran in 2012-2013 found that the reliability coefficient of the questionnaire using Cronbach's alpha formula is 0.85 (Nejat et al., 2020).

2.2.3. Mindfulness

Obsessive (Cognitive) Beliefs Questionnaire consists of 44 questions assessing the pathogenic dimensions in the cognitive domain of patients with obsessive-compulsive disorder. It was developed by a group of experts working on the structures of obsessive-compulsive thoughts and actions (Group, 1997). Respondents are asked to indicate their level of agreement or disagreement with each item on a scale of zero to seven. The test consists of six groups of thoughts and three subscales, which are key domains of cognition in obsessive-compulsive disorder. The subscales of the questionnaire include: 1- responsibility and threat assessment, 2- need for certainty and perfectionism, 3- importance and control of thoughts. The internal stability of the questionnaire in the study by Babapour Kheiroddin et al. (2013) is reported as 0.86 (Babapour Kheiroddin et al., 2013).

2.3. Data Analysis

For data analysis, descriptive statistical indices (frequency, chart, mean, and standard deviation) were utilized. Pearson correlation coefficient and multiple regression were used to analyze the research hypotheses after examining the assumptions. Data analysis was performed using SPSS software, version 25.

3. Findings and Results

The mean age of the study subjects was 24.63 with a standard deviation of 7.2.

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Table 1

Mean and Standard Deviation of Research Variables

Variable	Components	Mean	Standard Deviation
Obsessive Symptoms	Washing Symptoms	4.48	3.434
	Obsessive Thought Symptoms	4.51	2.816
	Hoarding Symptoms	2.49	2.457
	Ordering Symptoms	3.16	2.496
	Checking Symptoms	3.74	2.381
	Neutralizing Symptoms	2.51	2.638
Obsessive Beliefs (Cognitive Beliefs)		167.48	44.127
Mindfulness		65.99	12.189

Table 1 presents the statistical description of the research variables. Multiple regression analysis was used to examine and analyze the hypotheses (Table 2).

Table 2

Correlation of Cognitive Beliefs and Mindfulness with Symptoms of Washing in Obsessive-Compulsive Disorder

Variables	Cognitive Beliefs	Mindfulness	Regression Value	Determination Coefficient	F Value	Significance
Washing Symptoms	.560**	-.49**	0.626	0.392	105.847	0.001
Obsessive Thought Symptoms	.482**	-0.44**	0.568	0.323	78.285	0.001
Hoarding Symptoms	.540**	-.41**	0.581	0.337	83.53	0.001
Ordering Symptoms	.551**	-.489**	0.637	0.406	111.98	0.001
Checking Symptoms	.605**	-.451**	0.639	0.409	113.33	0.001
Neutralizing Symptoms	.474**	-.375**	0.514	0.264	58.79	0.001

** Correlation is significant at the 0.01 level (2-tailed).

According to the results (Table 2), the correlation coefficients of cognitive beliefs and mindfulness with the symptoms of obsessive-compulsive disorder are significant ($p < 0.01$). The analysis of variance test was used to check the significance of the regression model and the linearity of the relationship between the predictor and criterion variables (Table 3).

Table 3

Summary of Regression Model

Variable	Model	Non-standard Coefficients		Standard Coefficients	t-value	p	Collinearity	
		B	SE	Beta			Tolerance	VIF
Washing Symptoms	Constant	4.857	1.073	-	4.525	.000	-	-
	Cognitive Beliefs	.035	.004	.446	9.906	.000	.610	1.639
	Mindfulness	-.089	.011	-.315	-7.97	.000	.792	1.263
Obsessive Thought Symptoms	Constant	3.210	.823	-	3.899	.000	-	-
	Cognitive Beliefs	.015	.003	.260	5.47	.000	.610	1.639
	Mindfulness	-.054	.009	-.266	-6.37	.000	.792	1.263
Hoarding Symptoms	Constant	2.317	.777	-	2.981	.003	-	-
	Cognitive Beliefs	.021	.003	.391	8.333	.000	.610	1.639
	Mindfulness	-.041	.008	-.207	-5.03	.000	.792	1.263
Ordering Symptoms	Constant	2.150	.760	-	2.831	.005	-	-
	Cognitive Beliefs	.017	.002	.313	7.029	.000	.610	1.639
	Mindfulness	-.057	.008	-.280	-7.18	.000	.792	1.263
Checking Symptoms	Constant	2.547	.868	-	2.934	.004	-	-
	Cognitive Beliefs	.031	.003	.490	11.043	.000	.610	1.639
	Mindfulness	-.052	.009	-.226	-5.81	.000	.792	1.263
Neutralizing Symptoms	Constant	1.387	.908		1.529	.127		
	Cognitive Beliefs	.020	.003	.341	6.881	.000	.610	1.639
	Mindfulness	-.042	.009	-.196	-4.51	.000	.792	1.263

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Based on Table 3, tolerance values for a specific variable are indicative of multicollinearity if they are 0.01 or less, or if the VIF value is greater than 10. According to the results, the tolerance and VIF values are within the desired range, indicating that there is no multicollinearity among the independent (predictor) variables. Furthermore, according to the information in Table 3 and considering the standardized beta coefficients, it is observed that cognitive beliefs and mindfulness have the ability to predict symptoms of obsessive-compulsive disorder.

4. Discussion and Conclusion

This research aimed to predict symptoms of obsessive-compulsive disorder (OCD) based on cognitive beliefs and mindfulness in a non-clinical population. The results indicated that the combination of cognitive beliefs and mindfulness can predict symptoms of OCD. These findings align with previous research (Babapour Kheiroddin et al., 2013; Bakes, 2015; Hanstede et al., 2008; Hertenstein et al., 2012; Hosein Esfand Zad et al., 2017; Kroska et al., 2018; Leeuwerik et al., 2020; Mangal, 2013; Nejat et al., 2020). For instance, the research by Wells and Papageorgiou demonstrated that negative beliefs about uncontrollability and danger are related to psychopathology and obsessive thoughts (Wells & Papageorgiou, 1998). Others suggest that the activation of metacognitive beliefs about uncontrollability and danger causes emotional distress in individuals. This emotional distress in individuals with high scores in uncontrollability and danger leads them to engage in maladaptive coping strategies (e.g., avoidance, thought suppression) (Spada et al., 2008). Utilization of these strategies makes threatening concepts more accessible in processing, exacerbating stress and negative emotions. Indeed, these processes cause individuals to overestimate environmental threats and perceive their coping abilities as minimal, resulting in the continuation of psychological disorders.

Additionally, based on related findings, Najat, Rafezi, and Hossein Sabat (2020) conducted a study to predict symptoms of OCD based on components of mindfulness, cognitive emotion regulation strategies, and coping strategies (Nejat et al., 2020). Their results showed that self-blame from cognitive emotion regulation strategies and avoidance-oriented coping from coping strategies have a positive and significant relationship with symptoms of OCD. Also, non-judgmental acceptance and describing from mindfulness components and problem-focused coping from coping strategies have a negative and significant relationship with symptoms of OCD. In explaining this finding, Rachman's theory can be referred to, which considers cognitive biases like thought-action fusion as a significant factor in the pathology of clinical OCD (Rachman, 1997; Rachman, 2003; Rachman et al., 2006). The theory state that individuals with obsessive issues believe that thinking about unfortunate events increases the likelihood of these events occurring and that they are responsible for having such thoughts and should control their occurrence. This cognitive bias increases an individual's perceived responsibility for problems. According to Rachman's view, excessive responsibility stems from thought-action fusion. Overestimating the importance and responsibility associated with intrusive thoughts leads to the use of thought control strategies, which in turn exacerbates obsessive symptoms (Rachman, 1997; Rachman, 2003; Rachman et al., 2006).

Another explanation is that individuals with OCD symptoms feel a greater sense of responsibility for having negative thoughts compared to non-anxious individuals. Due to the prominent role of responsibility in recent OCD models, it's likely that OCD patients accept the responsibility of having negative thoughts and therefore attach significant importance to them. This increased importance may describe the exaggerated tendency towards thought/action fusion (Rachman, 2003; Rachman et al., 2006). Another explanation, based on Rachman's theory, is that cognitive biases such as thought-action fusion are considered significant factors in the pathology of OCD formation. As cognitive theories of OCD have suggested, the main problem for OCD patients seems to be the tendency to catastrophically misinterpret involuntary thoughts. In such cases, individuals catastrophically misinterpret their thoughts, imaginations, and impulses, believing they are at risk of going insane or facing danger. In this context, thought disorder must also be seen as a belief that increases the likelihood of such catastrophic interpretation (Shafran et al., 1996).

In explaining the relationship between mindfulness and hoarding symptoms, it can be said that individuals with higher mindfulness, by diminishing beliefs, judgments, and thoughts about experiences and preferring to directly experience phenomena as they occur, become less preoccupied with unpleasant thoughts and delusional thinking. They deal with realities as they occur (Baer, 2003). Therefore, as mindfulness scores increase, hoarding symptom scores in individuals are expected to decrease. Misinterpreting intrusive thoughts leads to obsessive anxiety

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and also to efforts to reduce such distress through avoidance, neutralization, and obsessive-compulsive rituals. Ultimately, these responses are detrimental to the individual themselves, as they create additional intrusive thoughts and reinforce hypotheses about the importance and danger of intrusive thoughts, thus perpetuating a flawed cycle. Furthermore, describing internal states (a component of mindfulness) helps in accepting an intrusive thought, which in turn eliminates vigilance and suppression, allowing individuals to test beliefs maintained due to internal anxiety states. Similarly, acceptance can reduce the need for worry about finding perfect and perfectionist solutions (Leahy, 2002), aiding in response flexibility and preventing automatic responses.

Mindfulness enables individuals to form a fundamentally different relationship with internal feelings and external events, through moment-to-moment awareness and behavior oriented towards rational responsibility rather than automatic reactivity. By purposefully employing higher mental functions such as attention, awareness, kindness, curiosity, and compassion, mindfulness can effectively control emotional responses through cortical inhibition of the limbic system (Kabat-Zinn, 2003). Therefore, individuals with higher levels of mindfulness exhibit fewer self-generated negative thoughts and believe they can free themselves from such thoughts (Frewen et al., 2008).

According to Wells (1999), obsessive thoughts activate metacognitive beliefs (thought fusion) about the meaning of thought. Beliefs at this level encompass beliefs about dangers and the meaning of thought, in which the boundary between thought and action, thought and event, and thought and object disappears. The activation of these inefficient metacognitive beliefs leads to negative evaluation of unwanted and intrusive thoughts, which in turn exacerbates OCD symptoms (Wells, 1999). Another explanation is that if an individual with OCD believes that thinking about an unacceptable or distressing event increases the likelihood of its occurrence, they are more likely to engage in ritualistic actions to prevent negative consequences and may believe that obsessive thoughts and negative actions are morally equivalent, causing stress and anxiety due to having these thoughts (Rachman, 1997; Rachman, 2003). Studies conducted on clinical and non-clinical individuals scoring high on OCD scales show that these individuals score higher on thought-action fusion constructs.

5. Limitations & Suggestions

This study used self-report tools for data collection, which potentially raises the issue of bias in using questionnaires. The use of convenience non-probabilistic sampling is another limitation of the research. The limited population is also a significant limitation of the study. Additionally, using a non-clinical population might affect the results; therefore, caution should be exercised in generalizing the results to a clinical population. The cross-sectional nature of the research process is another limitation of the current study. Based on the results, it is suggested to use the variables of this research to reduce symptoms of obsessive-compulsive washing. Also, based on the findings, it is recommended to use mindfulness-related interventions to reduce checking obsessions and to use thought/action fusion and cognitive beliefs as screening and diagnostic tools. It is suggested to use the interventions and variables of this research for diagnosis, screening, and treatment of OCD symptoms. To overcome the limitations, it is suggested that future researchers use a combination of quantitative and qualitative methods and conduct a comparative study. Also, it is recommended to use random sampling methods in future research for a more robust sample. Furthermore, it is recommended to conduct similar research with a clinical sample and compare the results with the findings of the current study. It is suggested to use a larger statistical sample in future research to obtain more reliable statistical results. Finally, it is suggested to conduct similar research considering gender to facilitate gender-based analysis.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for

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ethical research involving human participants. In adherence to ethical principles, an ethics code numbered IR.IAU.TABRIZ.REC.1400.50 was obtained from the ethics committee. Written consent was acquired from the participants. The researcher informed the subjects about their responsibilities in the research and clearly answered their questions. Subjects were free to participate or withdraw from the research at any stage. The information collected from participants during the research was kept confidential.

Authors' Contributions

Rozna Asgharnezhad, Marziyeh Alivandi Vafa, and Reza Abdi all played essential roles in this research project. Rozna Asgharnezhad contributed to the research design, data collection, and the examination of cognitive beliefs and mindfulness in a non-clinical population. Marziyeh Alivandi Vafa provided expertise in psychological research methodology and data analysis. Reza Abdi, offered guidance and supervision throughout the research process.

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