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Modeling Structural Equations of Thought/Action Fusion, Cognitive Beliefs, Mindfulness, and Experiential Avoidance with Symptoms of Obsessive-Compulsive Disorder in a Non-Clinical Population

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A B S T R A C T

Objective: This study aimed to examine the structural relationships between thought/action fusion, cognitive beliefs, mindfulness, and experiential avoidance with symptoms of OCD in a non-clinical population.

Methods and Materials: The research design was descriptive-correlational. The statistical population of this study included all university students in Tabriz. A sample of 500 individuals was selected using convenience sampling. The research instruments included the revised Obsessive-Compulsive Inventory, the Thought/Action Fusion Scale, the Obsessive Beliefs Questionnaire, the Mindfulness Attention Awareness Scale, and the Acceptance and Action Questionnaire (second version). Pearson's correlation coefficient and structural equation modeling were used to analyze the research hypotheses. Data analysis was performed using SPSS version 25.

Findings: The statistical analysis results indicated that the combination of cognitive beliefs, mindfulness, and experiential avoidance variables could predict the symptoms of washing, obsession, hoarding, order, checking, and neutralizing symptoms of OCD ($p < .05$).

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

Keywords: *Cognitive Beliefs, Thought/Action Fusion, Mindfulness, Experiential Avoidance, Obsessive-Compulsive Disorder Symptoms.*

1. Introduction

Many theorists of obsessive-compulsive models consider cognition as one of the main factors in the formation of obsessive-compulsive disorder (Foa et al., 1984). Several studies, including those by the expert group working on obsessive-compulsive structures (2005), have pointed out the belief in the importance of thoughts and thought control in patients with obsessive-compulsive disorder (Clark & Purdon, 2004). Cognitive theories

explaining obsessive-compulsive disorder emphasize the role of various cognitive beliefs and their interrelationships as the main cognitive factors in the emergence of the disorder's symptoms. Salkovskis (1989) believes that the central cognitive factor in obsessive-compulsive disorder is the excessive sense of responsibility that the person has for their intrusive thoughts, which leads to neutralizing activities (compulsive behaviors) and is directly related to obsessive symptoms (Salkovskis, 1989).

In Rachman's theory (1997), thought-action fusion plays a more important role. According to him, thought-action fusion increases perceived responsibility and compels actions to reduce these feelings (Rachman, 1997). According to Rachman's cognitive model (1997), excessive responsibility stems from thought-action fusion. Over-evaluating the importance and responsibility associated with intrusive thoughts leads to the use of thought control strategies, which in turn exacerbates obsessive thoughts (Rachman, 1997; Rachman, 2003).

Many studies have reported a positive and significant correlation between obsessive-compulsive symptoms and thought-action fusion, considering it a powerful predictor of disorder symptoms (Abramowitz et al., 2003; Barrett & Healy, 2003; Belloch et al., 2010; Lee et al., 2023; Rassin et al., 2000; Reuman et al., 2018; Xiong et al., 2021). Moreover, in a study by Rassin et al. (1999), experimental manipulation to increase thought-action fusion led to an increase in the frequency of intrusive and unwanted thoughts and discomfort. Research has shown that specific symptoms of obsessive-compulsive disorder, such as fear of impulses, contamination, and excessive commitment, have roots in the three types of thought-action fusion (Wells, 1999).

Various studies have reported mindfulness as effective in obsessive-compulsive symptoms (Babapurkhyraddin & Pursharifi, 2012; Bakes, 2015; Hertenstein et al., 2012; Hosein Esfand Zad et al., 2017; Kroska et al., 2018; Leeuwerik et al., 2020; Mangal, 2013; Nejat et al., 2020). Mindfulness is defined as "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Moore & Malinowski, 2009). Mindfulness enables an individual to create a fundamentally different relationship with their inner experiences and external events through moment-to-moment awareness and behavior oriented toward wise responsibility rather than automatic reactivity. By purposefully employing higher mental functions, such as attention, awareness, compassionate attitude, curiosity, and empathy, mindfulness can effectively control emotional reactions by inhibiting the limbic system (Kabat-Zinn, 2003). Therefore, individuals with higher levels of mindfulness show fewer spontaneous negative thoughts and believe they can liberate themselves from such thoughts (Frewen et al., 2008). The use of mindfulness can employ a metacognitive processing approach, increasing flexibility in response to threats (Toneatto, 2002). Mangal (2013) reported a relationship between mindfulness and obsessive symptoms in a non-clinical population (Mangal, 2013). Becks (2015) also reported a significant negative relationship between mindfulness and obsessive-compulsive symptoms (Bakes, 2015).

In recent years, experiential avoidance has been considered a transdiagnostic factor that can play a significant role in the formation and persistence of many mental health problems. Experiential avoidance is defined as inflexible efforts to avoid emotional or psychological experiences, suppress, or control them (Hershenberg et al., 2017). The function of experiential avoidance is to control or minimize the impact of distressing experiences and can negatively reinforce avoidant behavior by providing immediate and short-term relief. This avoidance becomes problematic when it interferes with daily functioning and achieving personal life goals (Sarawgi et al., 2013; Twohig et al., 2006). Experiential avoidance contrasts with acceptance, which means a person's willingness to fully embrace thoughts, emotions, and behavioral manifestations without trying to avoid them and is associated with psychological inflexibility (Kroska et al., 2018).

Given the diverse symptomatology of obsessive-compulsive disorder, the different perspectives, and the varying results regarding the relationship between the research variables and obsessive-compulsive disorder symptoms, and the lack of research on the structural relationship between the research variables and obsessive-compulsive disorder symptoms, this study aims to answer whether the structural relationships of thought/action fusion, cognitive beliefs, mindfulness, and experiential avoidance with obsessive-compulsive disorder symptoms in a non-clinical population have a desirable fit.

2. Methods and Materials

2.1. Study Design and Participants

The research design was descriptive-correlational with structural equation modeling. The statistical population of the study included all students (male and female) from the universities in Tabriz (Tabriz Azad University, Tabriz

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University, and Shahid Madani University). According to Schumacher and Lomax (2004), a sample size of 200 to 450 people is recommended for correlational studies (p. 20). In this study, 500 participants were selected using convenience sampling, considering a possible 10% drop-out rate. Questionnaires were administered individually. The researcher informed the participants about their responsibilities in the research and clearly answered their questions. Participants were free to participate or withdraw from the study at any stage. Information collected during the study was kept confidential. Three questionnaires were used to collect data.

2.2. Measures

2.2.1. Obsessive-Compulsive Disorder

This self-report scale assesses the severity of obsessive-compulsive symptoms in clinical and non-clinical populations. It has 18 questions scored on a five-point scale from 0 to 4. It includes six subscales: washing, obsessive thoughts, hoarding, orderliness, checking, and neutralizing. Each subscale contains three questions. The internal consistency for the entire scale in OCD and generalized anxiety disorder groups was reported as .81 and .93, respectively (Foa et al., 2002). The internal consistency of the subscales was also high, ranging from .34 to .93 for different groups. The correlation between subscales ranged from .31 to .57. The internal consistency of the Persian version was reported as .85 (Mohammadi et al., 2009).

2.2.2. Thought-Action Fusion

Designed by Shafran, Thordarson, and Rachman (1996), this scale consists of 19 items that measure thought-action fusion probability and thought-action fusion morality. Scoring is based on a five-point Likert scale from 0 (completely disagree) to 4 (completely agree). Norian (2007) reported satisfactory psychometric properties. In a study by Bakhshipour et al. (2012), the internal consistency coefficients for the total scale and subscales ranged from .79 to .95, and the test-retest reliability coefficients ranged from .59 to .63 (Amini et al., 2011).

2.2.3. Obsessive Beliefs

This questionnaire includes 44 items that assess pathogenic dimensions of cognition in patients with obsessive-compulsive disorder. Developed by the expert group working on obsessive-compulsive structures (2005), respondents indicate their level of agreement or disagreement with each item on a scale from 0 to 7. The questionnaire consists of six groups of thoughts and three subscales addressing key cognitive domains in obsessive-compulsive disorder: 1) responsibility and threat estimation, 2) the need for certainty and perfectionism, and 3) importance and control of thoughts. The internal consistency of the questionnaire was reported as .86 (Babapurkhyraddin & Pursharifi, 2012).

2.2.4. Mindfulness Attention Awareness

Designed by Brown and Ryan (2003), this 15-item questionnaire is scored on a six-point Likert scale (1 = almost always to 6 = almost never). The minimum score is 15, and the maximum is 90, with higher scores indicating higher mindfulness. The internal consistency of this scale, measured by Cronbach's alpha, was reported as .82 to .87 (Najati, 2009). Manavi Pour, Baghdasaryan, and Khodai Sakhlou (2012) conducted a psychometric evaluation of the mindfulness questionnaire among 350 students in Tehran and reported an alpha coefficient of .85. The results of the principal component and varimax rotation analysis showed that the questionnaire had two factors explaining 44.522% of the total variance, namely non-reactivity to inner experiences and action with awareness (Nejat et al., 2020).

2.2.5. Experiential Avoidance

This self-report tool measures experiential avoidance (psychological flexibility) (Bond et al., 2011). It assesses the extent to which an individual shows psychological flexibility, defined as the ability to fully engage with the present moment and the thoughts and feelings that arise without defense, and to persist or change behavior in line with values and goals. The first version of this questionnaire was designed by Hayes et al. (2004) for use in adult population studies and included several processes of acceptance and commitment therapy indicating psychological flexibility. Several versions of this questionnaire exist. The present study used the second version, a 10-item questionnaire addressing the shortcomings of the initial version. Scoring is based on a seven-point Likert scale from 1 to 7. Questions 2, 3, 4, 5, 7, 8, and 9 are reverse-scored. The internal consistency of this questionnaire was reported as .87, and the test-retest reliability as .80 (Zakiei et al., 2017).

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2.3. Data analysis

Descriptive statistics (frequency, chart, mean, and standard deviation) were used to analyze the data. Pearson's correlation coefficient and multiple regression were used to test the research hypotheses after examining the assumptions. Data analysis was performed using SPSS version 25.

3. Findings and Results

The following describes the statistical characteristics of the studied individuals. It is worth noting that the average age of the participants is 24.63 years with a standard deviation of 7.2.

Table 1

Mean and Standard Deviation of Research Variables

Variable	Components	Mean	Standard Deviation
Obsessive Symptoms	Washing Symptoms	4.48	3.434
	Obsessive Thoughts	4.51	2.816
	Hoarding Symptoms	2.49	2.457
	Orderliness Symptoms	3.16	2.496
	Checking Symptoms	3.74	2.381
	Neutralizing Symptoms	2.51	2.638
Thought-Action Fusion	Moral Fusion	21.56	9.705
	Probability for Others	7.06	3.539
	Probability for Self	6.31	2.806
	Total Score	34.94	14.957
Obsessive Beliefs	General	50.94	18.742
(Cognitive Beliefs)	Perfectionism and Certainty	48.46	12.142
	Responsibility and Threat	31.00	8.802
	Importance and Control	22.65	8.135
	Completion of Tasks	14.43	6.829
	Total Score	167.48	44.127
Experiential Avoidance	Avoidance of Emotional Experiences	24.27	9.432
	Control over Life	13.00	3.525
	Total Score	37.27	8.822
Mindfulness	Non-reactivity to Inner Experience	26.81	5.246
	Acting with Awareness	35.23	7.271
	Total Score	65.99	12.189

Table 1 presents the statistical description of the research variables. Multiple regression was used to analyze the hypotheses, and the results are presented below.

Table 2

Correlation Matrix of Thought/Action Fusion, Cognitive Beliefs, Mindfulness, Experiential Avoidance with Washing Symptoms

Row	Variables	1	2	3	4	5
1	Thought-Action Fusion	1				
2	Cognitive Beliefs	.572**	1			
3	Experiential Avoidance	.292**	.481**	1		
4	Mindfulness	-.355**	-.438**	-.462**	1	
5	Washing Symptoms	.325**	.560**	.561**	-.496**	1

Based on the results in Table 2, the correlation coefficients of thought/action fusion, cognitive beliefs, mindfulness, and experiential avoidance with washing symptoms of obsessive-compulsive disorder are significant ($p < .01$).

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Table 3

Path Coefficient of the Relationship between Thought/Action Fusion, Cognitive Beliefs, Experiential Avoidance, and Mindfulness

Path	Standard Coefficient	Unstandardized Coefficient	Standard Error	t Value	Sig
Thought-Action Fusion -> Washing	-.03	-.01	.02	-.42	.68
Cognitive Beliefs	.41	.03	.01	3.98	***
Experiential Avoidance	.42	.12	.03	4.60	***
Mindfulness	-.18	-.06	.02	-2.77	.01
Thought-Action Fusion -> Checking	.03	.01	.02	.33	.74
Cognitive Beliefs	.66	.03	.01	5.36	***
Experiential Avoidance	.08	.02	.02	.77	.44
Mindfulness	-.20	-.05	.02	-2.55	.01
Thought-Action Fusion -> Orderliness	.20	.03	.01	2.36	.02
Cognitive Beliefs	.47	.02	.00	3.49	***
Experiential Avoidance	.02	.00	.02	.19	.85
Mindfulness	-.28	-.06	.02	-3.35	***
Thought-Action Fusion -> Obsessive Thoughts	.20	.03	.02	2.04	.04
Cognitive Beliefs	.41	.01	.01	2.65	.01
Experiential Avoidance	.05	.01	.02	.39	.69
Mindfulness	-.29	-.05	.02	-2.92	.00
Thought-Action Fusion -> Hoarding	.10	.02	.01	1.13	.26
Cognitive Beliefs	.59	.02	.01	4.06	***
Experiential Avoidance	.06	.01	.02	.50	.62
Mindfulness	-.21	-.04	.02	-2.25	.02
Thought-Action Fusion -> Neutralizing	.10	.01	.02	.85	.39
Cognitive Beliefs	.73	.02	.01	3.84	***
Experiential Avoidance	-.21	-.03	.02	-1.25	.21
Mindfulness	-.30	-.05	.02	-2.48	.01

Based on the results in Table 3, there is a structural relationship between cognitive beliefs, experiential avoidance, and mindfulness with washing symptoms of obsessive-compulsive disorder ($p < .05$). There is a structural relationship between cognitive beliefs and mindfulness with checking symptoms ($p < .05$). There is a structural relationship between thought-action fusion, cognitive beliefs, and mindfulness with orderliness symptoms ($p < .05$). There is a structural relationship between thought-action fusion, cognitive beliefs, and mindfulness with obsessive thoughts symptoms ($p < .05$). There is a structural relationship between cognitive beliefs and mindfulness with hoarding symptoms ($p < .05$). There is a structural relationship between cognitive beliefs and mindfulness with neutralizing symptoms ($p < .05$).

The chi-square to degrees of freedom ratio (χ^2/df) does not confirm the model fit. The Root Mean Square Error of Approximation (RMSEA) is 0.079 and the Standardized Root Mean Square Residual (SRMR) is 0.48, which is greater than the criterion (0.08), thus not confirming the model fit. Finally, the IFI, CFI, NFI, and RFI indices are also below the desired criterion (0.9). Overall, the computed fit indices indicate a lack of fit for the hypothesized model.

4. Discussion and Conclusion

The results showed that the combination of thought/action fusion, cognitive beliefs, mindfulness, and experiential avoidance can predict the checking symptoms of obsessive-compulsive disorder. This result aligns with the prior findings (Abramowitz et al., 2003; Babapurkhyraddin & Pursharifi, 2012; Bakes, 2015; Barrett & Healy, 2003; Belloch et al., 2010; Benatti et al., 2020; Chakraborty & Karmakar, 2020; Coles et al., 2005; Fava et al., 2022; Fergus & Wu, 2010; Foa et al., 1984; Hertenstein et al., 2012; Hosein Esfand Zad et al., 2017; Kim et al., 2016; Krebs & Heyman, 2015; Kroska et al., 2018; Lee et al., 2023; Leeuwerik et al., 2020; Mangal, 2013; Manos et al., 2010; Mohammadi et al., 2009; Nejat et al., 2020; O'Neill & Feusner, 2015; Rachman, 2003; Rassin et al., 2000; Reuman et al., 2018; Salehi et al., 2014; Sarawgi et al., 2013; Shafran et al., 1996; Storch et al., 2019; Taylor et al.; Twohig et al., 2006; Wells & Papageorgiou, 1998; Wheaton et al., 2010; Xiong et al., 2021).

In explaining the relationship between mindfulness and hoarding symptoms, it can be said that individuals with high mindfulness tend to experience phenomena directly as they

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happen, reducing beliefs, judgments, and thoughts about experiences, leading to disengagement from unpleasant and delusional thoughts, and confronting reality as it happens (Kroska et al., 2018). Therefore, as mindfulness scores increase, hoarding symptom scores decrease, which is expected. Misinterpretation of intrusive thoughts leads to obsessive anxiety and efforts to reduce such distress through avoidance, neutralization, and compulsive behaviors. Ultimately, these responses are detrimental to the individual as they create additional intrusive thoughts and reinforce hypotheses about the importance and danger of intrusive thoughts, perpetuating a vicious cycle.

According to Wells (2000), obsessive thoughts activate metacognitive beliefs (thought-action fusion) about the meaning of thoughts. Beliefs at this level involve beliefs about the dangers and meanings of thoughts, where the boundary between thought and action, thought and event, and thought and object is blurred. Activation of these dysfunctional metacognitive beliefs leads to negative evaluation of unwanted and intrusive thoughts, exacerbating obsessive symptoms. Based on the ACT (Acceptance and Commitment Therapy) perspective, obsessive symptoms persist due to avoidance of psychological experiences such as doubt, anxiety, and worry. According to ACT, it is not thoughts and feelings that cause problems, but the efforts to control or avoid them (Twohig et al., 2006).

5. Limitations & Suggestions

In this study, self-report tools were used to collect data, which could potentially introduce bias. The use of non-probabilistic convenience sampling is another limitation of the study. The limited population is also a significant limitation. Additionally, the use of a non-clinical population may influence the results; therefore, caution should be exercised when generalizing the results to a clinical population. The cross-sectional nature of the study is another limitation. Based on the results, it is suggested to utilize the present research variables to reduce obsessive washing symptoms. Furthermore, based on the findings, interventions related to thought-action fusion can be used to reduce checking obsessions, and thought-action fusion and cognitive beliefs can be used as screening and diagnostic tools. It is recommended to use the present study's interventions and variables for the diagnosis, screening, and treatment of obsessive-compulsive symptoms.

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Declaration

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

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

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

To adhere to ethical principles, an ethics code (IR.IAU.TABRIZ.REC.1400.50) was obtained from the ethics committee. Written consent was obtained from the participants.

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.

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Authors' Contributions

All authors contributed equally. This article is derived from a doctoral dissertation at Islamic Azad University.

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