

Research Paper

Structural Equation Modeling of Intolerance of Uncertainty and Symptoms of Depression and General Anxiety Disorder: Investigation of the Mediating Role of Rumination



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ABSTRACT

Objectives Generalized anxiety disorder and depression, one of the common problems in childhood and adulthood is associated with many problems in the field of health. This study aimed to investigate the mediating role of rumination in the relationship among Intolerance of Uncertainty (IU) and symptoms of depression and General Anxiety Disorder (GAD).

Methods In this descriptive correlational study, a sample of 250 students from Iran University of Medical Sciences were selected using cluster sampling method. The participants responded to intolerance of uncertainty scale and rumination scale, Generalized Anxiety Disorder Questionnaire Inventory-revised (GAD-Q-IV), and Beck depression inventory. The obtained data were analyzed using Structural Equation Modeling (SEM). For statistical analysis, SPSS V. 22 and LISREL 85.9 were used to classify, process, and analyze the data and to investigate the hypotheses of the research.

Results The evaluation of hypothetical model with fit indexes demonstrated that the hypothetical model fits the measurement model (CFI=0.98, NFI=0.96, and RMSEA=0.060).

Structural relations analysis also indicated intolerance of uncertainty indirectly through rumination over depression and directly and indirectly general anxiety disorder.

Conclusion Thus, based on the current research findings, rumination has a mediating role in relationship between intolerance of uncertainty and symptoms of depression and general anxiety disorder. Considering these dimensions, the employed mechanisms can be useful in developing efficacious preventive and therapeutic interventions for depression.

Extended Abstract

1. Introduction

Intolerance of uncertainty significantly contributes to the experience of anxiety in general anxiety and other anxiety disorders,

including obsessive-compulsive disorder [9, 10] and mood disorders [11, 12]. De Jong-Meyer, Beck and Riede [17] in their findings reported that individuals with higher intolerance of uncertainty have greater worry and rumination. In other words, the relationship between Intolerance of Uncertainty (IU), worry and rumination is a causal relationship. Most research in this field has been conducted on patients

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with anxiety (especially general anxiety disorder). For example, studies have indicated that uncertainty is the key in the explanation of concern as the main feature of the general anxiety disorder [27-29]. However, very few studies have examined IU between mood disorders. Because of the similarities and common factors between generalized anxiety disorder and depression, the question is whether the IU is also associated with depression or not. However, this has attracted a relatively less empirical interest in depression.

Spasojevic' and Alloy [36] postulated rumination as a mediator between cognitive risk factors/vulnerabilities and negative psychological outcomes (e.g. depression). Spasojevic' and Alloy indicated that people with cognitive risk factors/vulnerabilities for depression (e.g. IU, self-criticism) are likely to consistently engage in rumination to cope with their negative mood. Thus, these authors conceptualized rumination as the underlying link (i.e. mediator) between cognitive vulnerability (e.g. IU) and adverse psychological outcomes. Accordingly, the purpose of this study is to present a hypothetical model and test it through Structural Equation Modeling (SEM) approach.

2. Method

The present study is a fundamental type and of a descriptive-correlational type in terms of data collection. Considering the minimum sample size required when the variables of the model (in the hypothesized model of the present study, 13 variables) ranges from 10 to 15, the sample size should be

between 200 and 400 [37]. Therefore, the sample size of this study was equal to 250 subjects. To choose the subjects, by cluster sampling method, four colleges (School of Medicine, School of Paramedicine, School of Nursing and Midwifery, School of Public Health) were randomly selected. Then from each college, a number of students were randomly selected to include them in the research.

To test the research hypotheses, the collected data were analyzed using SPSS V. 22 and LISREL 8.85 [42]. The fitness of the hypothesized model was assessed using SEM method. The data analysis was performed using the two-step approach of Anderson and Gerbing [43] as follows: in the first step, Confirmatory Factor Analysis (CFA) was used to assess the fitness of the measurement model, and in the second step, SEM was employed to assess the hypothesized structural model.

3. Results

Table 1 presents the matrix of correlation coefficients between the variables of the research. According to the Table 1, the correlations are significant ($0.549 \geq r \geq 0.357$). The measurement model specifies the relationship between the observed and latent variables. The evaluation of the model was done using CFA method. The fit indices of the measurement model (Table 2) presents a satisfactory fitness for this model. Therefore, the observed variables are capable of operating the latent variables.

Table 1. Correlation matrix of research variables

Variables	1	2	3	4
Intolerance of uncertainty	1			
Rumination	0.409**	1		
Depression	0.357**	0.549**	1	
Anxiety	0.442**	0.462**	0.427**	1

** P<0.01

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Table 2. Fit indices of measurement and structural models

Indice	Chi-square	df	χ^2/df	RMSEA	SRMR	GFI	CFI	NFI
Measurement model	100.21	59	1.698	0.059	0.054	0.93	0.98	0.96
Structural model	103.59	60	1.726	0.060	0.055	0.93	0.98	0.96

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Abbreviations: RMSEA; Root Mean Square Error of Approximation; SRMR; Standardized Root Mean square Residual; GFI; Goodness of Fit Index; CFI; Comparative Fit Index; NFI; Normed Fit Index

Table 3. Bootstrap test results for intermediate relationships

Independent	Variable		Bootstrap Bound		Estimation Error	Effect Size	P
	Mediating	Dependent	UpperBound	LowerBound			
Intolerance of uncertainty	Rumination	Depression	0.469	0.205	0.069	0.337	0.05
Intolerance of uncertainty	Rumination	Anxiety	0.329	0.102	0.058	0.216	0.05

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In addition, assessing the structural model via the SEM method revealed that all fit indices of the hypothesized model were within the appropriate fitness range. Table 2 presents the fit indices for this model. Figure 1 depicts the hypothetical structural model with its standard coefficients. As seen in Figure 1, intolerance of uncertainty as an exogenous variable affects the rumination with a standard coefficient of 0.50. In addition, rumination affects general anxiety disorder and depression with standard coefficients of 0.72, 0.49, respectively. In the current study, the Bootstrap test was employed to evaluate the intermediate relationships. In this method, if the upper and lower limits of this test are either positive or negative, and zero is not between these two limits, then the indirect causal path will be significant. Table 3 presents the results of this test.

4. Discussion

The purpose of this study was to investigate the mediating role of rumination in the relationship between intolerance of uncertainty with symptoms of depression and general anxiety.

Structural relations between the variables of the study indicate a good fit of the hypothesized model. To explain these findings, it can be said that those who have a lot of rumination, are susceptible [21] to obscure events, pessimistic forecasts and thoughts [48]. Rumination may maintain or increase the level of uncertainty. In addition, individual mental retardation, unsolved problems, and higher level of uncertainty can persist because rumination disrupts problem solving. Therefore, rumination may increase the link between uncertainty and anxiety intolerance by reinforcing and increasing distress related to uncertainty.

Theoretically, the results of this research provide a supportive framework for Spasovich and Alvoy's conceptual framework of rumination as interface between cognitive vulnerability and negative implications. This effect of rumination as a mediator indicates that people with a high level of uncertainty intolerance tend to chew on disturbances and disorders that worsen symptoms of anxiety and depression. In this study, uncertainty intolerance may lead to negative consequences (such as depression, anxiety) through passive

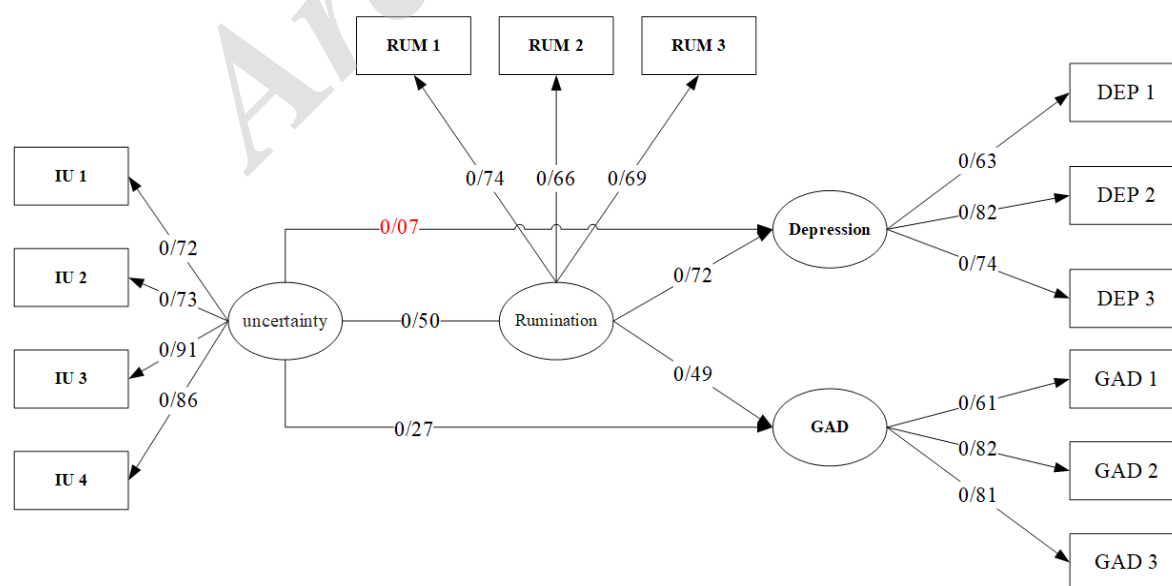


Figure 1. Structural model of the study and its standard coefficients

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concentration of rumination on negative experiences, which instead of active management, prolongs the stress associated with uncertainty intolerance. Perhaps, people with uncertain intolerance think that rumination will help them to better understand their feelings, gain insights and find solutions to the unknown situations they encounter.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article. The participants were informed about the purpose of the research and its implementation stages; they were also assured about the confidentiality of their information; Moreover, They were allowed to leave the study whenever they wish, and if desired, the results of the research would be available to them.

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Authors contributions

All authors contributed in preparing this article.

Conflict of interest

The authors declare no conflict of interest.

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