



The Prediction of Psychological Distress Tolerance based on the Motivational Structure and Traumatic Events Mediated by Ambiguity Tolerance in IBS Patients: A Structural Equation Modeling

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Quantitative Study

Abstract

Background: Irritable bowel syndrome (IBS) is a critical syndrome that harms the psychological, communicational, social, and emotional processes of individuals. Considering the importance of this topic, the present study was conducted with the aim to examine the relationship between motivational structure, traumatic events, and psychological distress tolerance mediated by ambiguity intolerance in individuals with IBS.

Methods: The present correlational research was conducted using structural equation modeling (SEM). The statistical population comprised all individuals with IBS referring to the Digestive Disease Research Institute of Shariati Hospital, Iran, in 2020. From among these patients, 177 individuals were selected using convenience sampling method. The data were gathered using the Kessler Psychological Distress Scale (K10), Personal Concerns Inventory (PCI), Ambiguity Tolerance Scale-II (MSTAT-II), and Life Events Checklist (LEC). SPSS software was used for the preliminary data analysis and SmartPLS software was used for PLS modeling.

Results: The results of data analysis indicated the direct effect of adaptive motivation structure and traumatic events on distress tolerance. The aforementioned variables could also affect the distress tolerance of individuals with IBS by influencing their ambiguity tolerance ($P < 0.01$). However, traumatic events had a higher indirect effect through ambiguity tolerance compared to their direct effect. Furthermore, adaptive motivation structure had no significant direct or indirect effect on distress tolerance.

Conclusion: This study confirmed the relationship between motivational structure and traumatic events with the mediating role of ambiguity intolerance among IBS sufferers.

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Furthermore, further studies must be conducted on ambiguity tolerance and the problems of individuals with IBS regarding the plethora of scientific evidence on the etiology of IBS syndrome.

Keywords: Psychological distress; Irritable bowel syndrome; Life changing events

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Introduction

Stress and anxiety are factors that cause irritable bowel syndrome (IBS) (Banerjee, Sarkhel, Sarkar, & Dhali, 2017). Clinical and experimental evidence showed that IBS is a combination of an irritable bowel and an irritable brain (Padhy, Sahoo, Mahajan, & Sinha, 2015). Moreover, psychological stresses have a marked impact on intestinal sensitivity, motility, secretion, and permeability, and the underlying mechanism has a close correlation with mucosal immune activation, alterations in the central nervous system, peripheral neurons, and gastrointestinal microbiota. Stress-induced alterations in neuroendocrine-immune pathways act on the gut-brain axis and microbiota-gut-brain axis and cause symptom flare-ups or exacerbation of IBS. IBS is a stress-sensitive disorder (Qin, Cheng, Tang, & Bian, 2014).

In a systematic review of 6 studies in 36 countries worldwide, the prevalence of IBS equaled 3.8% (Oka, Parr, Barberio, Black, Savarino, & Ford, 2020). The most recent study on IBS prevalence in Iran was conducted on 4763 people within the age range of 19-70 years and indicated a total IBS prevalence of 21.5% and a higher prevalence among women compared to men (Hassanzadeh Keshteli, Dehestani, Daghighzadeh, & Adibi, 2014). Many studies have emphasized the role of social-psycho-bio factors in the development of clinical features and IBS severity (Thakur, Quigley, El-Serag, Gudleski, Lackner, 2016). Some of the psychological dysfunctions observed in patients with IBS include high and mostly unreal personal expectations (a high-level perfectionism) (Spence, & Moss-Morris, 2017), unhealthy stress coping styles, sleep disorder (Park & Lee, 2017), early maladaptive schemas (Besharat & Dehghani, Gholamali Lavasani, & Malekzadeh, 2015; Sokhanvar Mojdehi, Belyad, & Tari Moradi, 2016), impaired body consciousness (Muscatello et al., 2016), fault tolerance (Besharat et al., 2015), and low quality of life (QOL) (Kopczyńska et al., 2018; Jamali et al., 2012).

Recent studies have shown a higher probability of IBS in the group with an unhealthy lifestyle compared to the group with a healthy lifestyle. Stress and psychological pressures in patients with IBS are beyond their tolerance, and thus, these distresses and stresses make their life challenging. Generally, the causes and clinical symptoms of psychological distress have been identified in patients with IBS. A review of the theoretical and research evidence can contribute to the explanation of psychological distress among patients with IBS. Determination of the causes of psychological distress in gastrointestinal diseases, particularly IBS, in addition to the results obtained by Cassar et al. (2018), indicate that psychological distress can significantly predict symptoms of IBS. The motivational structure of patients with IBS significantly affects their psychological distress because these patients are more motivated to show unhealthy behaviors, bad diet habits, and unhealthy lifestyles. The correlation between the mentioned behaviors and the mental health of patients leads to severer anxiety and distress among patients with IBS (Guo, Zhuang, Kuang, Zhan, Wang, & Liu, 2015).

Motivational structure indicates how to choose and pursue goals, and predicts individuals' tendency for unhealthy behaviors (Cox & Klinger, 2002). Cox and Klinger (2002) introduced two types of adaptive and maladaptive motivational structures. Individuals with a maladaptive motivational structure tend to derive their emotions through an unhealthy method; they pursue avoidant goals, goal achievement is not much pleasure for them, and if they fail they do not feel optimistic. Individuals with maladaptive motivational structures pursue their goals

without thinking about success or failure. They follow their goals unrealistically and do not feel positive even if they are successful. The mentioned signs are contrary to the adaptive motivational style. Seemingly, the maladaptive motivational structure is an underlying factor for other problems individuals face. Accordingly, Hauser et al. (2014) believe that IBS patients highly tend to interpret events negatively, which may lead to higher psychological distress making these patients show specific avoidant behaviors in both normal life events and challenges. Therefore, maladaptive motivation of IBS patients tends towards negative behaviors, which in turn disrupts the life, and psychological and physical discipline of these patients, thus leading to higher psychological distress.

The other part of psychological distress caused by IBS must be searched in traumatic events, which leads to stress in the form of psychological disorder. The traumatic event is a common incident; the estimated endurance of such events has been reported equal to 26-92.2% and 17.7-87.1% among men and women, respectively (Creamer et al., 2001; quoted from Basharpour & Hoseinikiasar, 2016). According to the results obtained by Hassanzadeh et al. (2017), there is a positive relationship between stressful events, psychological distress, depression, and anxiety. The experience of stressful events has raised concerns for the occurrence of these events in the future. Moreover, the ambiguous circumstances of these events and fear of them may make the patients more doubtful, thus reducing ambiguity tolerance among them.

Ambiguity intolerance refers to the incapacity to endure the aversive response triggered by the perceived absence of salient, key, or sufficient information and sustained by the associated perception of uncertainty. Ambiguity intolerance indeed represents the fear of the unknown (Carleton, 2016). Tolerance of ambiguity (TA) is defined as a method in which a person or a group faces a set of unfamiliar, complex, and uncertain procedures (Furnham & Marks, 2013). The effect of ambiguity intolerance on depression, anxiety, and psychological distress has been confirmed in clinical and non-clinical populations (Enoki, Koda, Nishimura, Kondo, 2019).

According to the studies on ambiguity intolerance, the effects of stress and anxiety can reduce ambiguity tolerance (Mikaeeli et al., 2018). Findings obtained by Zargham Hajebi, Najarian Noshabadi, and Faraji (2017) indicated low average ambiguity tolerance in IBS patients, and a significant correlation between QOL, ambiguity tolerance, negative affect, and social inhibition. It seems that the stress resulting from traumatic events and behavioral distresses caused by maladaptive motivations reduce the tolerance level.

Besharat et al. (2015) conducted a study on the mediating role of ambiguity tolerance and found a positive and significant relationship between intolerance of uncertainty and severity of symptoms. There was also a significant positive association between early maladaptive schemas and intolerance of uncertainty. Results showed that intolerance of uncertainty did not play a mediating role in the relationship between early maladaptive schemas and the severity of IBS symptoms.

Therefore, most studies on IBS in Iran have concentrated on the effects of IBS on the QOL and psychological traits of patients, while there is no study on the prediction of the underlying psychological factors of IBS, particularly ambiguity intolerance based on the various internal and external factors. For this purpose, the present study was conducted with the aim to examine the aforementioned variables in Iranian IBS patients to predict its effect on psychological distress. Hence, the role of exogenous factors, such as stressful events, and endogenous factors, including ambiguity tolerance and motivational structure, must be identified in IBS patients

due to comorbid somatic and mental diseases and the high prevalence of this syndrome among the Iranian population. Identification of the aforementioned features paves the way to finding psychotherapy approaches, teaching skills to IBS patients, reducing cost and duration of therapies, and helping mental health planners to provide suitable psychological support and interventions, as well as preventive procedures to improve the mental wellbeing of IBS patients. Therefore, the present study was performed with the aim to find the relationship between mediating variables of ambiguity tolerance, motivational structure, traumatic events, and psychological distress in individuals with IBS.

Methods

This descriptive (non-experimental), correlative research was conducted using structural equation modeling (SEM). The study population included all patients with IBS who referred to the Gastroenterology Research Center of Shariati Hospital in Tehran, Iran, in 2020.

In this research, 177 subjects were chosen using the convenience sampling method to increase the statistical power and external validity of the study. The study inclusion criteria were as follows: obtaining a score less than the mean score of the Kessler Psychological Distress Scale (K10), being 20-50 years of age, and having at least a diploma degree. The exclusion criteria included blood in stool, gastrointestinal bleeding, pregnancy or decision to become pregnant, weight loss during the past 3 months, abdominal surgery, a palpable mass in the abdomen, and mental illness in the last 2 years. It is worth noting that this study was approved under the ethical code of IR.IAU.TON.REC.1399.011 by Islamic Azad University, Tonekabon Branch.

A) Kessler Psychological Distress Scale: The K10 assesses the emotional state of the patient during the recent month based on 10 questions and was designed by Kessler, Barker, Colpe, Epstein, and Gfroerer (2003). The questions are scored on a 5-point Likert scale ranging between 0 and 4, with a maximum score of 4. The studies conducted on the K10 have indicated a strong relationship between high scores of this scale and diagnosis of mood and anxiety disorders with the Composite International Diagnostic Interview (CIDI). Moreover, there was a less but significant association between K10 scores and other psychological diseases (Andrews & Slade, 2000). In addition, the K10 has appropriate sensitivity and features to screen individuals with anxiety and depression; it is used as a measure to control and monitor post-treatment procedures (Kessler et al., 2003). Furthermore, other studies implied the validity of K10 for screening studies and identifying mental disorders (Green et al., 2010). In addition, Vasiliadis et al. (2009) and Anderson et al. (2011) reported the acceptable validity and reliability of this questionnaire for elderly people. Yaghoubi (2015) reported the reliability of K10 to be equal to 0.83 using Cronbach's alpha in Iran. The present study obtained reliability equal to 0.91 for this questionnaire using Cronbach's alpha coefficient.

B) Personal Concerns Inventory: The Personal Concerns Inventory (PCI) (Cox & Klinger, 2004) is the revised version of the Motivational Structure Questionnaire (MSQ developed by Klinger, Cox, Blount, Allen, and Columbus, (1995). Factor analysis of the aforementioned dimensions led to 2 general factors. The first factor was an adaptive motivational structure that indicates fundamental elements to achieve a satisfying solution for personal concerns, and the second one was a maladaptive motivational structure that indicates indifference in achieving personal goals (Cox et al., 2003). The dimensions 1, 2, 3, 4, 6, 7, 10, and 11 were entered into the

analysis as indicators of the latent construct of adaptive behavior, while dimensions 5, 8, and 9 were entered into the analysis as indicators of the latent construct of maladaptive behavior. Evidence indicates the acceptable validity and reliability of the MSQ. In terms of confirmed validity of the MSQ for the sample, a study indicated that skin conduction in subjects increased when they observed the goals selected in the MSQ (Nicole, Klinger, Alerson, & Guttman, 1993; quoted from Cox & Klinger, 2002). Fadardi (2003) designed the PCI, which includes 10 indicators for 2 types of samples, students and alcohol abusers. Cronbach's alpha coefficients for students and alcohol abusers equaled 0.77 and 0.75, respectively (Fadardi, 2003). Previous studies have reported that the Persian version of the PCI and each of its components have suitable internal consistency (Sharbaf, Fadardi, & Cox, 2004).

C) The Multiple Stimulus Types Ambiguity Tolerance Scale-II: The 13-item Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II) was developed by McLain (2009). Each item is scored based on a 5-point scale ranging from strongly agree to strongly disagree. Scores of higher than 45 are suggestive of a suitable tolerance level. McLain (2009) reported the reliability coefficient of this questionnaire to be 0.82 using Cronbach's alpha. Feizi, Mahbobi, Zare, and Mostafaei (2013) measured the validity of the MSTST-II and found a construct validity of 0.48 and reliability coefficient of 0.85 using Cronbach's alpha. Aalipour, Abbasi, Mirderikvand (2018) also reported the reliability of this questionnaire as equal to 0.8 based on Cronbach's alpha. In the present study, the reliability of this questionnaire was calculated to be 0.85 using Cronbach's alpha.

D) Life Events Checklist: The Life Events Checklist (LEC) was developed at the National Center for Post-traumatic Stress Disorder (PTSD) and the Clinician-Administered PTSD Scale (CAPS) was designed by Weathers et al. (2013). LEC is used before CAPS to determine how to deal with traumatic events (Blake et al., 1995). The LEC is composed of 17 items, and each item represents the domain of PTEs from natural disasters to other stressful events. Bae, Kim, Koh, Kim, and Park (2008) examined the psychiatric feature of the Korean version of the LEC and found Kappa value and internal consistency of the 17 items to be equal to 0.619 and 0.66v (Cronbach's alpha), respectively. Exploratory factor analysis was used to determine the validity of the ELC in Iran, and the results indicated 4 factors, including accidents/incidents, damages, rape/assault, and abnormal experiences that explained 62.49% of the variance in variables. Cronbach's alpha coefficient of the ELC equaled 0.76, indicating a reliability value of greater than the average rate (Shadkam, Molazadeh, & Yavari, 2016).

The study adds in the current literature of PLS-SEM as an assessment model for direct and mediation relationships

Results

Findings obtained from the collected data have been presented in descriptive and inferential statistics. According to the demographic data, among the total selected IBS patients (177), there were 131 women (74.8%) and 46 men (26.2%). Moreover, 103 subjects (58.3%) were married, while 74 subjects (41.7%) were single. In terms of education level, 35 subjects (19.8%) had a diploma, 13 subjects (7.3%) had an associate degree, 88 subjects (49.7%) had a BA, 37 subjects (20.8%) had an MA, and 4 subjects (2.3%) had a Ph.D. degree. In terms of age range, 64 subjects (34.5%) were 2-30 years old, 89 subjects (50.3%) were 31-40 years old, and 37 subjects (15.3%) were 41-50 years old. The average age equaled 31 years. Table 1 shows the descriptive indexes of the research variables

Table 1. Descriptive indexes of the research variables

Variables	n	Min	Max	Mean	SD	Kurtosis	Skewness
Ambiguity tolerance	177	26.00	57.00	39.2316	5.55320	0.103	-0.258
Traumatic events	177	44.00	88.00	64.8531	10.38689	-0.039	-0.972
Adaptive motivation	177	9.00	51.00	34.0508	7.98242	-0.330	0.176
Maladaptive motivation	177	2.00	28.00	14.9435	5.79647	-0.083	-0.725

According to the results of the Kolmogorov-Smirnov test, no variables had the following conditions for normal distribution of scores. Since the PLS method is not sensitive to the non-normal distribution of data in model fit, the SmartPLS software (version 3.2.8, SmartPLS GmbH, Germany) was used for structural equations due to the non-normality of data. In the SmartPLS software, the t-value represents the significance of variables' effects on each other. If the t-value is greater than 1.96, their effect is positive and significant, and if the t-value is between 1.96 and -1.96, the variable has no significant effect. In addition, path coefficients of greater than 0.60, 0.3-0.6, and less than 0.3 indicate a strong, moderate, and weak relationship between variables, respectively (Chin, 2003; Vinzi, Chin, Henseler, & Wang, 2010). Table 2 presents the results of the Spearman correlation test of the association between the studied variables and divergent validity. Furthermore, the Fornell-Larcker method was used to assess divergent validity.

As can be seen in table 2, psychological distress tolerance (dependent variable) correlated with all three variables of traumatic events, motivational structure, and psychological distress ($P < 0.05$). There was a negative relationship between distress tolerance and variables of traumatic events, maladaptive motivational structure, and psychological distress, while there was a positive relationship between distress tolerance and adaptive motivational structure. Accordingly, an increase in traumatic events, motivational structure, and psychological distress leads to a reduction in psychological distress tolerance. However, an increase in adaptive motivational structures leads to a rise in psychological distress tolerance. The severity of the correlation between variables varied between -0.441 and 0.635.

SEM technique (based on PLS method) relies on some statistical assumptions, which lead to higher accuracy of this method in the estimation of coefficients. In terms of sample size presumption, modeling requires large samples. Some believe that the minimum sample size for analysis generally varies between 100 and 250 (Khin, 2013). The calculated sample size for the present study was 200 samples, which was a suitable sample size for SEM. Normal distribution of variables is an assumption for modeling through LISREL and Amos software (covariance-based methods); the PLS technique was used in the present study due to the non-normal distribution of the two main variables.

Table 2. Correlation coefficients between the research variables and divergent validity

	Ambiguity tolerance	Traumatic events	Adaptive motivational structure	Maladaptive motivational structure	Psychological distress
Ambiguity tolerance	1				
Traumatic events	-0.522**	1			
Adaptive motivational structure	0.285*	-0.442**	1		
Maladaptive motivational structure	0.041	0.215*	-0.502**	1	
Psychological distress	-0.323**	0.635**	-0.472**	0.321**	1

** $P < 0.01$, * $P < 0.05$

Another assumption was a lack of strong collinearity between independent variables (traumatic events, motivational structure, and psychological distress). As there was no strong correlation between the three independent variables, there was no strong collinearity between variables affecting psychological distress tolerance. Figure 1 shows the SEM in terms of path coefficient mode and t-values.

Table 3 presents the goodness of fit indicators of the model. As can be seen in table 3, most models fit the model; therefore, the drawn path has a good fit. Table 4 shows the direct effects of research variables.

Ambiguity tolerance mediation role test

Table 5 presents the inhibitory results of intermediate relationships using bootstrap test. The result obtained from the findings presented in table 5 shows that the obtained t-statistics of all the paths entered in the present model of non-adaptive motivational structures are confirmed by tolerance of ambiguity at a significant level ($P < 0.01$). This means that all direct paths and all indirect paths have a significant effect on psychological distress.

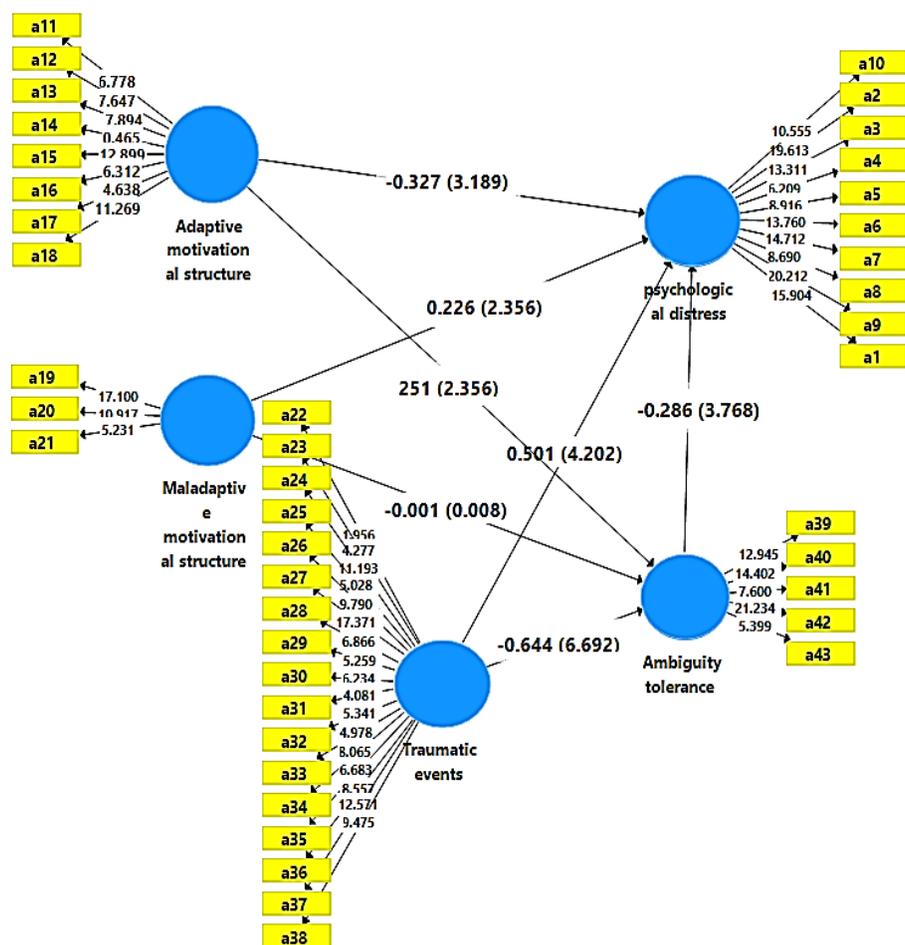


Figure 1. SEM in terms of path coefficient mode and t-values

Table 3. Goodness of fit indicators of the model of the mediating role of ambiguity tolerance in the relationship between motivational structure, traumatic events, and psychological distress

	SRMR	d_ULS	d_G	Chi-Square	NFI
Saturated Model	0.075	0.275	0.081	164.012	0.805

Standard bootstrapping (500 bootstrap samples) was used with 177 sample observations for the present study to examine the significance of path coefficients. Therefore, considering the presented materials, the research hypothesis is confirmed based on the effect of adaptive motivational structure and traumatic events by tolerating ambiguity on the tolerance of psychological distress in people with IBS. Moreover, the mediating role of ambiguity tolerance in influencing the non-adaptive motivation structure with significant distress tolerance was not obtained.

Discussion

The purpose of this study was to examine the mediating role of ambiguity intolerance in the relationship between motivational structure, traumatic events, and psychological distress among individuals with IBS. The results indicated the strong predictive role of ambiguity intolerance in concerns and psychological distress. Therefore, distressed and anxious people suffer from a kind of ambiguity intolerance (Shihata, McEvoy, & Mullan, 2018; Oglesby & Schmidt, 2017; Hancock & Mattick, 2019; Fadaee, Panahi Gorji, Miladi Gorji, and Hooshyar, 2018). Ambiguity intolerance has 3 of the 4 conditions necessary to be considered as a risk factor for worry and distress; there is a close relationship between ambiguity intolerance and worry, ambiguity intolerance is changeable, and changes in ambiguity intolerance have been before worry changes in most of the treatment course. However, previous studies have considered that condition 4 indicates that factor A (ambiguity intolerance) must be before factor B (excessive worry and anxiety) (quoted from Bagheri et al., 2018). People with ambiguity intolerance cannot bear daily stressful events, so they experience higher distress levels. Moreover, these individuals may believe that they do not have problem-solving skills for the effective management of uncertain situations, which may lead to lower self-worth (Fahimi, Aliloo, Poursharifi, Fakhari, Akbari, & Rahim Khanli, 2014).

Table 4. Direct effects of research variables

	Original Sample (O)	Standard Deviation (SD)	T Statistics (O/SD)	P-value
Adaptive motivational structure -> Ambiguity tolerance	-0.251	0.011	2.356	0.047
Adaptive motivational structure -> psychological distress	-0.327	0.012	3.189	0.001
Ambiguity tolerance -> psychological distress	-0.286	0.015	3.768	0.015
Maladaptive motivational structure -> Ambiguity tolerance	-0.001	0.095	0.009	0.993
Maladaptive motivational structure -> psychological distress	0.226	0.048	2.356	0.044
Traumatic events -> Ambiguity tolerance	-0.644	0.093	6.915	0.001
Traumatic events -> psychological distress	0.501	0.12	4.171	0.001

Table 5. Indirect effects of research variables

	Original Sample (O)	Standard Deviation	T Statistics (O/SD)	P-value
Adaptive motivational structure -> Ambiguity tolerance -> psychological distress	-0.0717	0.015	1.968	0.048
Maladaptive motivational structure -> Ambiguity tolerance -> psychological distress	-0.0002	0.011	0.001	0.999
Traumatic events -> Ambiguity tolerance -> psychological distress	-0.184184	0.077	3.103	0.018

There is a negative and significant association between traumatic events and ambiguity tolerance, meaning that stressful events affect the underlying attitude and beliefs of the person. Studies have shown the effect of traumatic life events on depression, serotonin transporter-linked promoter region (5-HTTLPR), wellbeing and family functioning, coping skill, optimism, and generalized anxiety (Tiwari & Deshpande, 2020; Houwing et al., 2021; Haberstick et al., 2016; Zhao et al., 2021; Farčić & Barać, 2012; Houwing, Buwalda, van der Zee, de Boer, & Olivier, 2017; Taher, Mahmud, Amin, 2015). Assessments have confirmed the effect of these events on cognitive dysfunctions (Boyle, Lawton, Arkbage, Thorell, & Dye, 2013). It can be explained that when individuals face stressful events which affect life experiences tensions, they find it difficult to tolerate these conditions in the absence of emotion regulation and effective skills. Exposure to stressful events is a barrier to problem-solving approaches and active adaptation (Baumeister, Gailliot, DeWall, Oaten, 2006). Seemingly, stressful events change the attitudes and perception functions of individuals and reduce their ambiguity tolerance by influencing their cognitive systems. Studies have found a negative and significant relationship between perceived stress and ambiguity tolerance (Fadaee et al., 2018). It can be explained that different types of stressful events evoke many challenges, and many mental reactions, such as stress, anxiety, and depression. The aforementioned reactions may cause many problems in controlling anxiety and stress symptoms, poor decision-making skills, and dysfunctional social interactions that leave destructive and negative effects on the QOL. Moreover, the low ambiguity tolerance resulting from possible stressful events may convert to chronic intolerance. The results of the present study were consistent with findings obtained by Radman et al. (2016) and Abedi, Mogtabaei, and Bagheri (2020) who found that ambiguity tolerance has a negative mediating role in the relationship between traumatic events and psychological distress. Individuals with low ambiguity tolerance of severe distress sense in facing life events may bring this assumption these the response of these individuals to life events may be traumatic (Keinan, 1994). However, ambiguity intolerance not only causes severe psychological distress, but also causes traumatic events (Ruderman et al., 2014). According to research evidence, ambiguity intolerance increases the consequences of traumatic events, which intensifies the effect of these events (Fetzner, Horswill, Boelen, & Carleton, 2013; Goto et al., 2006; Lee, Taylor, & Drummond, 2006). Shiri, Rachel, and Marianne (2007) conducted a study on individuals who have experienced a traumatic event and found that individuals with low ambiguity tolerance reported a higher distress level compared to individuals with high ambiguity tolerance, even if not exposed to a traumatic event. The mentioned finding is in line with previous studies indicating that individuals with ambiguity intolerance tend to have more concern, magical thinking, and causal assignment, which are cognitive mechanisms that distort the truth to

increase control (Urvi & Douglas, 2021). The therapies introduced for the empowerment of the patient in coping with uncertainty (Iannello, Mottini, Tirelli, Riva & Antonietti, 2017) may help them to cope with stressful life events and reduce the consequences of these events. In addition, in a recent study, ambiguity tolerance has been reduced in students to help them deal with stressful events during their studies (Avery and Douglas, 2021).

Moreover, the study indicated the significant effect of adaptive motivational structure on psychological distress tolerance through ambiguity tolerance. It can be stated that adaptive motivational structure can reduce psychological distress through the mediating role of ambiguity tolerance. The mediating role of ambiguity tolerance in the relationship between adaptive motivational structure and psychological distress can be explained based on the meaning of ambiguity tolerance being the extent to which a person feels risk and problems in adapting them to life events. If changes occur rapidly and unpredictably, information will be insufficient and non-transparent. In this case, the difference between people affects their reaction and response (Zambianchi & Ricci Bitti, 2014). Individuals with high ambiguity tolerance usually have a complicated understanding of events, and follow the cognitive-perceptual style in their interpretations. Sanders et al. have also stated that scientific assessments of ambiguity in behavioral sciences, such as psychology and management, have attracted the attention of scientists of other human sciences towards the importance of individuals' understanding of ambiguity in terms of advantage or threat in other areas of life. Individuals' response to ambiguity in different areas of life and in various forms affects many of their mental and behavioral aspects. In practice, individuals' perception of ambiguity manifests itself in the two concepts of advantage and threat causing tolerance and intolerance. Ambiguity tolerance refers to individuals' tendency to interpret uncertain situations that are sources of risk and concern (Sanders, Whited, Martino, 2013). Herman et al. (2010) believe that individuals give cognitive, emotional, and behavioral responses to uncertain situations that are mostly new, complex, unsolvable, unpredictable, and doubtful. The responses might be negative or positive. Cognitive reactions include those responses that indicate the person's desire for the interpretation of the uncertain situation through black and white thinking. Moreover, emotional responses refer to the expression of concern, grief, hatred, anger, and anxiety in response to an uncertain situation. Behavioral responses refer to those responses including rejection or avoidance of the uncertain situation.

Conclusion

In general, this study confirmed the relationship between motivational structure and traumatic events with the mediating role of ambiguity intolerance among IBS sufferers. Moreover, further studies must be conducted on ambiguity tolerance and problems of individuals with IBS regarding the plethora of scientific evidence on the etiology of IBS syndrome. However, studies that aim to find the relationship between factors and their effects face many limitations. The present study also had some limitations. For instance, the researcher could not examine the role of other variables, such as socioeconomic class. Hence, it is suggested that these variables be considered in future studies. It is also recommended that this study be conducted on IBS patients referring to all medical centers and hospital wards of gastrointestinal diseases in Tehran, Iran. Moreover, further studies can control the confounding variables of biological depression, intelligence, and socioeconomic and cultural status of patients.

Considering the mediating role of ambiguity tolerance in psychological distress and higher ambiguity tolerance in the mental health of IBS patients, some interventions and treatments must be designed to increase ambiguity tolerance, especially among IBS patients. Furthermore, it is necessary to incorporate the adaptive motivational structure in educational discussions.

Conflict of Interests

Authors have no conflict of interests.

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