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Intolerance of Uncertainty, Emotional Dysregulation, and Health Anxiety: The Moderating Role of Coronavirus-Related Stress

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Quantitative Study

Abstract

Background: Health anxiety is a psychological problem the behavioral consequences of which can lead to increased referrals to the health care system. This problem can be even more important during the coronavirus pandemic. This study was conducted with the aim to investigate the moderating role of coronavirus-related stress in the relationship of intolerance of uncertainty (IU) and emotional dysregulation (ED) with health anxiety.
Methods: This web-based, cross-sectional study was conducted on 403 individuals (54.8% women) with a mean age of 36.3 years. The data collection tools included the Intolerance of Uncertainty Scale (IUS), Difficulties in Emotion Regulation Scale (DERS), COVID Stress Scale (CSS), and Whitley Index (WI). Hierarchical regression and the Pearson correlation were used to analyze the data.
Results: The findings revealed that IU and ED explained 32% of the variance in health anxiety. The moderating role of coronavirus-related stress in the relationship of IU and ED with health anxiety was 12% ($p < 0.01$). In total, the research variables predicted large proportions of variance ($R^2 \geq 0.45$) in health anxiety.
Conclusion: Regarding the specific complicated characteristics of the Covid-19 pandemic and the resulting injuries, coronavirus-related stress (especially its 3 dimensions of danger and contamination fears, traumatic stress symptoms, and compulsive checking) appear to play an important role in health anxiety. In addition, the interaction of coronavirus-related stress with IU and ED significantly predicts an increase in health anxiety. Therefore, to reduce the burden of health anxiety, coronavirus-related stress interventions are required.
Keywords: COVID-19; Health; Anxiety; Uncertainty; Emotional regulation

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Introduction

Health anxiety or illness anxiety is excessive worrying about having a medical condition or preoccupation with developing a serious, undetected medical illness (Asmundson, Taylor, Carleton, Weeks, & Hadjstavropoulos, 2012). Health anxiety has been conceptualized as misinterpretation and misappraisal of bodily sensations as signs of a physical illness in cognitive-behavioral models (Abramowitz & Braddock, 2008). According to cognitive-behavioral models traits, precipitating events, cognitions, and dysfunctional behaviors have an important role in initiating and maintaining health anxiety (Jungmann & Witthoft, 2020). A stressful event can activate the maladaptive schemas about health and illness through automatic negative thoughts, attention bias, and catastrophic interpretation of vague symptoms (Witthöft et al., 2015).

Following the outbreak of COVID-19, the World Health Organization (WHO) declared a global health emergency on January 30th, 2020 (Kamel Boulos & Geraghty, 2020). The COVID-19 pandemic has marked an unprecedented era in humankind's history through causing hopelessness and loss of control across the globe. It seems that the long-term psychological effects of this virus cannot be specified exactly at the current time. However, published reports have cited increasing levels of anxiety particularly toward the sense of uncertainty (Achenbach, 2020; Trougakos, Chawla, & McCarthy, 2020). A study found a significant association ($R^2 \geq 30$) between COVID-19-related stress and psychological symptoms including depression, anxiety, disturbed function, and health anxiety (Gallagher, Zvolensky, Long, Rogers, & Garey, 2020). In addition, Sauer, Jungmann, and Witthoft (2020), in their study indicated that during the COVID-19 pandemic, health anxiety was accompanied by increased levels of preventive behaviors and seeking reassurance of the absence of an illness. In this study, intolerance of uncertainty (IU) did not moderate the relationship between health anxiety and COVID-19 anxiety.

Upsetting and worrying conditions can give rise to bias in attention to threatening situations (Mogg & Bradley, 2005). IU is a negative emotional and cognitive reaction towards unpredictable events or uncertain situations and has been recognized as one of the key factors in developing and maintaining unproductive worry (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). People with high health anxiety seek medical reassurance, and this often exacerbates their symptoms. In addition, health anxiety leads to increased use of the health care system (Weiss, Rief, & Kleinstauber, 2017). Generally, studies show that there is a significant association between IU and elevated health anxiety as well as catastrophic appraisal of health problems (Fergus & Bardeen, 2013; O'Bryan & McLeish, 2017; Tull et al., 2020). During the COVID-19 outbreak, high IU can intensify negative emotions and worries about perceived COVID-19 fatality, which exacerbate health anxiety (Asmundson & Taylor, 2020a).

Emotion regulation involves the impact of emotions, duration of emotions, and the ways of experiencing and expressing emotions in individuals (Gross & John, 2003). In stressful situations, emotional dysregulation (ED) in the form of inability in identifying and understanding one's emotions can lead to erroneously attributing symptoms and bodily sensations to a serious disease (Fergus & Valentiner, 2010). In the study by Bardeen and Fergus (2014), 5 of the 6 dimensions of ED had a significant positive relationship with health anxiety. Emotion suppression as an emotion regulation strategy in some studies has been significantly associated with health anxiety (Fergus & Valentiner, 2010; Gorgen, Hiller, & Witthoft, 2014; Trougakos et al., 2020).

In addition to the effects of coronavirus on physical health, persistent

uncertainties related to the COVID-19 pandemic, and excessive behavioral changes caused by the virus due to social distancing can have unique and profound effects on mental health (Wang et al., 2020). Health anxiety can have deleterious effects on people's psychological well-being and functioning. Individuals with high levels of health anxiety use health care systems excessively. These individuals are more likely to experience physical limitations, poor job performance, disability, anxiety, and depression (Fink, Ornbol, & Christensen, 2010). Furthermore, given the burden of health anxiety on healthcare systems during the coronavirus pandemic, it seems important to investigate the role of coronavirus-related stress in the current situation. Therefore, this study was conducted with the aim to investigate the moderating role of coronavirus-related stress in the relationship of IU and ED with health anxiety.

Methods

Study Population: The sample size consisted of 403 participants (Female: 221, Male: 182) with an age range of 18-61 (Mean ± SD = 36 ± 10.7). In the multivariate regression analysis, a minimum of 15 samples for each study variable can predict variance (Stevens, 2012). Thus, for 4 variables, 403 individuals was considered a good sample size. Participants from different Iranian ethnicities participated in this study. According to the descriptive analysis of the data, 62% of the participants were Fars, 16% Turk, 7% Kurd, 8% Lor, 1% Arab, and 6% of other ethnicities. Moreover, 42% of the subjects were single and 58% were married. In terms of educational level, 40% had a diploma and pre-diploma education and 60% had an academic education.

Procedure: The study research plan was web-based and cross-sectional. After preparing the questions, an online link of the questionnaires (http://porsall.com) and the necessary descriptions and explanations were provided to participants through various social networks (e.g., WhatsApp, Linkedin, Telegram, Facebook, and Instagram). The inclusion criteria included living in Iran, being 18 years of age and above, and being able to read and write. The exclusion criterion was incomplete questionnaires. After endorsing the internet-based informed consent, the study participants were automatically directed to the research scales' main page. The data was gathered from October 3 to December 30, 2020 (3 months). Based on ethical considerations, all participants were assured that their personal data would be protected. Subjects were also informed of the general content of the study and the study method used. The current study was confirmed and registered by the ethical research committee of Shahid Beheshti University of Medical Sciences, Iran (IR. SBMU. MSP. REC.1399.263).

Measures

COVID Stress Scale: This 36-item self-report questionnaire was developed by Taylor et al. (Taylor et al., 2020). The results of factor analysis showed 5 main factors that include Covid-19 contamination, dangers, and fears, fear of Covid-19 socio-economic consequences, xenophobia, obsessive checking, and traumatic stress signs (Khosravani, Asmundson, Taylor, Sharifi, & Samimi Ardestani, 2021). Cronbach's alpha was higher than 0.80 for all subscales. Khosravani et al. (2021) have studied the psychometric properties of the Persian version of the CSS in Iran and have reported good validity and reliability. In this study, the overall Cronbach's α coefficient of the CSS was 0.95.

Intolerance of Uncertainty Scale: This scale is a self-report measure with 27 items. The Intolerance of Uncertainty Scale (IUS) was designed by Freeston et al. (1994) to assess people's IU in the face of ambiguous situations. The items are scored on a 5-point Likert scale. The IUS measures individuals' worries about uncertainty of future events and seeking knowledge for reassurance. The Cronbach's α and

test-retest reliability of the IUS were 0.94 and 0.74, respectively (Buhr & Dugas, 2002). The IUS has been validated in Iran. Its Cronbach's alpha was reported as 0.88 and its test-retest reliability at 3 weeks was reported as 0.76 (Naghavi, Akbari, & Moradi, 2018). The Cronbach's α of the IUS in this study was 0.94.

Difficulties in Emotion Regulation Scale: The Difficulties in Emotion Regulation Scale (DERS) is a self-report scale with 36 items developed by Gratz and Roemer (2004). The items are scored on a 5-point Likert scale. This measure includes the 6 main factors of lack of acceptance of emotional responses and goals, difficulty engaging in goal-directed behavior and impulse, impulse control difficulties and awareness, lack of awareness of emotions and strategies, limited access to strategies for regulation and clarity, lack of emotional clarity. This scale has good validity and reliability. Its Cronbach's α was above 0.80 for all subscales (Gratz & Roemer, 2004). The Persian version of this scale has been standardized in Iran. Internal consistency was determine for all factors using Cronbach's alpha and was within the range of 0.66-0.88 (Khanzadeh, Saeediyan, Hosseinchari, & Edrissi, 2012). In the present study, Cronbach's α of the DERS was 0.91.

Whiteley Index: Whiteley Index (WI)is a 14-item self-report scale that measures health anxiety. The original version of this scale (Pilowsky, 1967), was based on a true-false scoring system, but in later versions, its scoring system was changed to a 5-point Likert scale (Welch, Carleton, & Asmundson, 2009). The WI has shown good validity and reliability (Speckens, Spinhoven, Sloekers, Bolk, & van Hemert, 1996). The psychometric properties of the WI scale in Iran have been reported to be appropriate. The reliability of this scale was determined at 0.88 using Cronbach's alpha (Mahin, Habibeh, & Faezeh, 2017). Its Cronbach's α was 0.87 in the current study.

Data analysis: The statistical data were analyzed using the SPSS software (version 24; IBM Corp. Armonk, NY, USA). Before analyzing the collected data, the outliers were identified and removed, the normality of data was confirmed, and multicollinearity was rejected. Pearson correlation coefficient and hierarchical linear regression analysis were used.

Results

Means, standard deviations, skewness, kurtosis, and correlations among the study variables are presented in table 1. As can be seen in table 1, the variables of IU ($r = 0.47$; $P < 0.01$), ED ($r = 0.58$; $P < 0.01$), and coronavirus-related stress ($r = 0.58$; $P < 0.01$) had a significant positive relationship with health anxiety. In addition, the 3 dimensions of coronavirus stress including danger and contamination fears (0.58), traumatic stress symptoms (0.57), and compulsive checking and reassurance-seeking (0.51) had the highest correlations with health anxiety ($P < 0.01$).

Table 1. Means, standard deviations, skewness, kurtosis, and inter-correlations of study variables (Part I)

		Mean ± SD	Skewness	Kurtosis	1	2	3	4
WI	1	34.54 ± 10.33	0.30	-0.51	-	0.478**	0.528**	0.580**
IUS	2	79.95 ± 22.58	0.03	-0.52		-	0.591**	0.475**
DERS	3	93.84 ± 20.66	0.55	-0.03			-	0.410**
CSS	4	55.44 ± 25.44	0.28	-0.42				-
CSS(I)	5	25.01 ± 10.08	-0.24	-0.29				
CSS(II)	6	4.58 ± 4.85	1.13	0.66				
CSS(III)	7	11.01 ± 5.95	0.20	-0.71				
CSS(IV)	8	5.38 ± 6.04	1.22	0.62				
CSS(V)	9	34.54 ± 10.33	0.41	-0.48				

Table 1. Means, standard deviations, skewness, kurtosis, and inter-correlations of study variables (Part II)

5	6	7	8	9
0.496**	0.330**	0.309**	0.571**	0.516**
0.454**	0.285**	0.253**	0.432**	0.361**
0.390**	0.219**	0.194**	0.406**	0.328**
0.900**	0.596**	0.742**	0.779**	0.780**
-	0.465**	0.651**	0.565**	0.587**
	-	0.270**	0.379**	0.310**
		-	0.407**	0.461**
			-	0.683**
				-

Note: WI: Whiteley Index (Health Anxiety); IUS: Intolerance of Uncertainty; DERS: Difficulties in Emotion Regulation Scale; CSS: COVID Stress Scale (Total Score); Five Factors OF CSS: CSS (I): COVID danger and contamination fears; CSS (II): COVID fears of socio-economic consequences; CSS (III): COVID xenophobia; CSS (IV): COVID traumatic stress symptoms; CSS (V): COVID compulsive checking and reassurance-seeking; **P < 0.001; SD: Standard deviation

Hierarchical linear regression analysis was used to investigate the moderating role of coronavirus stress in the relationship of IU and ED with health anxiety. To do so, in the first stage, IU and ED were entered into Block 1, then, in the second stage the total coronavirus stress score was entered into Block 2. As has been indicated in table 2, IU and ED explained 32% of health anxiety variance (P < 0.01) and total coronavirus stress score explained 12% of health anxiety variance. In total, 45% variance in health anxiety was accounted for by all the study predictor variables. This means that increased coronavirus-related stress increases the effect of IU and ED on health anxiety.

Discussion

The main purpose of this study was to investigate the moderating role of coronavirus-related stress between intolerance of uncertainty and emotional dysregulation, and health anxiety It appears that during times of pandemics people are more in need of mental health services. In earlier pandemic studies (SARS quarantine), depression, anxiety, and traumatic reactions have been reported (Hawryluck, Gold, Robinson, Pogorski, Galea, & Styra, 2004). Studies in various countries (China, Iran, USA, and Germany) have shown high levels of anxiety due to coronavirus (Cao et al., 2020; Jungmann & Witthoft, 2020; Lee, Mathis, Jobe, & Pappalardo, 2020; Moghanibashi-Mansourieh, 2020). Coping behaviors and characteristics related to health anxiety such as avoidance (not gaining knowledge about the contagion of coronavirus and self-protection behaviors) and safety behaviors (seeking reassurance from therapists, web surfing) especially amid the Covid-19 outbreak can worsen the situation and be a double burden on health care system as well as patients (Newby, Hobbs, Mahoney, Wong, & Andrews, 2017).

Table 2. Hierarchical linear regression analysis results for the prediction of health anxiety

Predictor	B	SE B	β	T	R^2	ΔR^2	F	df1	df2
Model 1					0.32	0.32**	94.77	2	400
(Constant)	7.50	2.03		3.69					
IUS	0.12	0.02	0.25	4.99					
DERS	0.19	0.03	0.38	7.39					
Model 2					0.45	0.13**	106.67	1	399
(Constant)	7.45	1.83		4.05					
IUS	0.05	0.02	0.11	2.24					
DERS	0.15	0.03	0.30	6.32					
CSS	0.16	0.02	0.40	9.42					

IUS: Intolerance of Uncertainty; DERS: Difficulties in Emotion Regulation Scale; CSS: COVID Stress Scale; **P < 0.01
SE:Standard error; df: Degree of freedom

The findings of this study showed that all 5 factors of the CSS had a positive significant correlation with health anxiety, and among them, fear of danger and contamination, traumatic stress reaction, and compulsive checking/seeking reassurance had the highest correlation. This finding is in line with that of Gallagher et al. (2020), and Taylor, Landry, Paluszek, Fergus, McKay, and Asmundson (2020). According to the findings of these studies, experiences related to COVID-19 disease, death of acquaintances, and coronavirus-related stress are associated with a high risk of emotional disorders. COVID-19-related stress was a predictor of dysfunction and health anxiety. The results also showed that IU and ED predicted a significant amount of variance in health anxiety. This finding is consistent with the study of Bardeen and Fergus (2014), which showed that difficulty in emotional regulation plays an important role in health anxiety. It is also consistent with the studies by Fergus and Bardeen (2013) and Tull et al. (2020) on the relationship between IU and health anxiety.

The results showed that coronavirus-related stress exacerbates the effects of IU and ED on health anxiety.

This result is partly consistent with a recent study that showed that IU modulates the relationship between health anxiety and coronavirus-related stress (Wheaton, Messner, & Marks, 2021). Furthermore, in the study by Sauer et al. (2020), IU did not moderate the relationship between health anxiety and COVID-19 anxiety. However, in the current study, coronavirus-related stress was considered as a stress factor in moderating the role of IU and ED on health anxiety. Covid-19 death tolls can give rise to increased anxiety and emotional distress among individuals regarding their health and loved ones (Fiorillo & Gorwood, 2020). Moreover, the unique characteristics of this pandemic such as long latency, high death tolls, lack of effective treatments, and different clinical Covid-19 types of can increase the level of illness anxiety (Asmundson & Taylor, 2020b). Combining stressful situations with maladaptive emotional regulation strategies can exacerbate health anxiety (Gorgen et al., 2014). Through increased arousal level, and consequently, misinterpretation of bodily sensations as a serious condition, ED can lead to health anxiety (Gorgen et al., 2014). In addition, people with a low capacity for tolerance of uncertainty fear any physical sign and make catastrophic interpretations about it as a dangerous illness. These catastrophic thoughts result in more sensitivity towards bodily sensations, and consequently, intensify health anxiety (O'Bryan & McLeish, 2017). Recurring experience of worry regarding Covid-19 and its casualties can lead to hypervigilance and over-sensitization to minor bodily sensations and their misinterpretation (Tull et al., 2020). One of the limitations of this study is the online collection of participants. Although this approach allowed for the rapid collection of a community sample of adults, the sole reliance on self-report scales may have inflated the relationship between variables due to shared methods variance. In addition, participants from different Iranian ethnicities can be one of the strengths of this study.

Conclusion

The results of this study showed that coronavirus-related stress in combination with IU and ED plays a pivotal role in predicting health anxiety. They could account for a considerable portion of health anxiety. As health anxiety can lead to incompatible behaviors with health (avoidance, recurrent assurance seeking, and unnecessary checkups), it is of paramount importance to identify factors related to health anxiety and implement relevant interventions. Psychological interventions, especially cognitive-behavioral therapy (CBT) concerning these variables, can help reduce health anxiety.

Conflict of Interests

Authors have no conflict of interests.

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