Psychological predictors of coronavirus-related anxiety in Iranian young adults

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Abstract

Aim: The sudden outbreak of the Covid-19 virus in March and April 2020, sparked an emotional state of anxiety among different groups of society. The present study aimed to investigate the psychological predictors of coronavirus anxiety in Iranian young adults. Method: The sample included 517 women and men who responded to four electronic questionnaires posted on the researchers' Instagram pages between March 11th and 28th 2020. The e-questionnaires included the Corona Anxiety Inventory, the Distress Tolerance Scale (DTS), Revised Health Hardiness (RHHI-24), and the Health-Promoting Lifestyle Profile (HPLP-II). Results: Data was analyzed by using multi regression method in SPSS -24. The results of regression analysis showed that tolerating emotional distress, health hardiness, and a lifestyle that promotes health can significantly predict the anxiety caused by the coronavirus pandemic. In addition, it turned out that women experience more coronavirus anxiety than their male counterparts. Discussion & Conclusion: It can be concluded that psychological variables in stressful and ambiguous situations can determine the levels of anxiety that individuals experience. Implications for these results and limitations of the present study have been discussed.

Keywords: Coronavirus Anxiety, Distress tolerance, Health hardiness, Health-promoting Lifestyle.

Introduction

The coronavirus disease with early clinical symptoms such as fever (90% or more), cough (about 75%), shortness of breath (up to 50%), sticky mucus, headache and eventually severe breathing difficulty with a 2% mortality rate is spreading. On the first day of the outbreak, the World Health Organization (WHO) declared the situation a public health emergency (Mahase, 2020) and estimated that it would take at least 18 to 24 months for the vaccine to be made available. So, at the moment, most of the treatments are only supportive and symptom-based (Holshue et al., 2020).

This situation caused people, who face this disease, mostly scared of the illness and their death (Huang et al., 2020) or have fear of getting helpless and socially disgraced by this pervasive disease (Hall, Hall, and Chapman, 2008). Huang et al. (2020), in the concept of the psychological effects of Covid-19, showed that 53.8 percent of people reported moderate to severe psychological effects from the disease, 28.8 percent have symptoms of anxiety, while 1.8 percent have symptoms of moderate to severe stress, and 75.2 percent, despite staying at home, are worried about their family member's health. Anxiety caused by Covid-19 is mostly due to the unknown nature of the disease and our slight and antithetical knowledge of this virus aggravates the induced anxiety (Alipour et al., 2020). However, it seems that the rapid onset of coronavirus, besides the fact that no effective vaccine has yet been found (to the date the present study is reported) has led to the eruption of an emotional state in individuals which can be called the Corona anxiety. Previously, the anxiety caused by the spread of a virus was reported in studies such as Blakey and Abramowitz (2017), Blakey, Reuman, Jacoby, and Abramowitz (2015), Wheaton, Abramowitz, Berman, Fabricant, and Olatunji (2012) and Xie, Stone, Zheng, and Zhang (2011) about four viruses of Zika, Ebola, swine flu and SARS. Although regarding the worldwide spreading and increase in daily cases, it can be told clearly that the situation is related to people's anxiety about covid-19, and predictors of this anxiety are complicated and vague. Two factors were considered to trigger the anxiety caused by such viruses; one is the emotional readiness of the person to experience similar anxieties, and the second is the beliefs or knowledge that people have of the facts about the virus. The first category includes variables such as personality traits, psychological distress, anxiety tolerance, hardiness, and a lifestyle that promotes health. Among these variables, tolerance, health hardiness, and a health-promoting lifestyle are mentioned as three variables that are likely to play a role in anxiety induced by the spread of a variety of viruses (Wheaton et al., 2012).

Distress tolerance refers to the perceived capacity of people to tolerate physiological states and annoying negative emotions (Zvolensky, Vujanovic, Bernstein, and Leyro, 2010), such as ambiguity, uncertainty, and physical discomfort (Kaiser, Milich, Lynam, and Charnigo, 2012). In addition to the perceived capacity, distress tolerance refers to the behavioral manifestations of distressing internal states which are evoked by stressful factors (Zvolensky et al., 2010). Research has shown that in dealing with stressful events, people with high or low distress tolerance often act differently and may have either maladaptive responses such as avoiding negative emotions and behavioral disorders, or adaptive responses such as problem-solving (Keough, Riccardi, Timpano, Mitchell, and Schmidt 2010). Research also indicates a link between distress tolerance capacity in

unpredictable and threatening situations with anxiety and worry (Intrieri and Newell, 2020). Therefore, due to the widespread prevalence of the covid-19 virus and its unknown mechanism, people's ability to tolerate distress seems to play a role in predicting the level of anxiety they experience, and this situation affects their coping strategies and taking care of their health (Andrew and Sidwell, 2019).

Maddi and Harvey (2006) suggest that hardiness is common in all cultures and that it is based on the existential courage to struggle to find meaning in life, between the known past and the unpredictable future. Pollock's (1999) concept of health hardiness is based on the three variables of commitment, control, and struggle (Bartone et al., 2012). This perspective points to how much people perceive their health as controllable and are committed to doing health-related activities (Pollock, 1999). People with high levels of health hardiness believe in change and transformation in life, with a re-evaluation of health stressors, consider them as an opportunity to develop their personality and not just as threats and risks (Brooks, 2008). Bartone et al. (2012) believe that health hardiness plays an important role in regulating the amount of stress perceived by individuals. Research has demonstrated that in dealing with stressful situations, hardiness helps to develop social support, active coping, and optimal functioning which leads individuals to engage in health-promoting behaviors such as healthy nutrition, proper exercise, avoidance of risk factors, timely diagnosis and follow-up of disease symptoms and control of emotions (Motlagh, Mazloomi-Mahmoodabad, Momayezi, 2011).

According to Pender's Health Promotion Model, Health promoting lifestyles refers to how well individuals observe health-promoting behaviors in terms of responsibility, stress management, and interpersonal support. It shows how people act via innovative methods to maintain or increase their level of health, self-actualization, and personal satisfaction (Walker, Sechrit, and Pender, 1987). Therefore, hardiness is expected to be related to health and a lifestyle based on promoting health which in turn seems to be associated with people's anxiety about the prevalence of the coronavirus. But despite that, nearly all of the studies focused on clinical symptoms of sick people, treatments, and genomic sequencing of the virus and they rarely investigated the influences of the virus on normal and healthy people. Accordingly, it seems necessary to investigate the psychological effects of coronavirus on people to prepare suitable treatment and healthcare operations which aim to reduce or/and prevent psychopathology of the mentioned. It will not seem logical to restrict to two mentioned factors, which were previously researched in anxiety-related to virus pandemic (such as Zika, Ebola, swine flu, and SARS), to investigate coronavirus anxiety. Accordingly, this study aims to investigate the role of distress tolerance, health hardiness, and a health-promoting lifestyle in predicting the anxiety induced by the coronavirus pandemic in Iranian young adults.

Methods

In the present study, the descriptive correlation method was used. The participants of the study included 517 women and men who voluntarily completed online questionnaires between march 11th to march 28th 2020. Calculating the sample size according to the table of determining the sample size based on the population size Karjesi and Morgan (1970)

have provided a table that can be used to estimate the sample size based on the population size. For data collection in the present study, we prepared an online questionnaire, that will be introduced in the following passages, and sent to participants via SNS. In determining the time for collecting data, 517 participants answered e-questionnaires. Of 517 participants of the study 28 of them (5/4%) had middle school degrees, 97 individuals (18/8) had diplomas, 25 individuals (4/8) had an associate degree, 233 participants (45/1%) had bachelor's degrees, 110 individuals (21/3%) has master's degree and 24 participants (4/6%) had a doctorate. 58 of them (11/2%) tested positive for Covid-19 and 459 participants (88/8%) were negative. 163 of the participants (31/5) were men and the rest of them (354 individuals- 68/5%) were women. The following instruments were used in the present study.

Instruments

1.1.1.   Corona anxiety inventory

This questionnaire is designed based on questions used by Blakey and Abramowitz (2017), Blake et al. (2015) and Wheaton et al. (2012) used to measure people's anxiety about the Zika virus, swine flu, and Ebola. The instrument has 9 items, all coded on a five-point Likert scale from "not at all" equivalent to 1 to "very much" equivalent to 5. The internal consistency of these items in Blakey and Abramowitz's (2017) and Blakey et al.'s (2015) studies have been reported to be 0.84 and 0.85 respectively. In the present study, Cronbach's alpha for this instrument is equal to 0.80. Also, in the present study, the correlation coefficient of the questions with the total score of the test amounted to be in the range of 0.41 to 0.73, which is considered desirable based on Nunnally and Bernstein (1994).

1.1.2.   Distress tolerance scale

This scale is a self-assessment questionnaire to estimate emotional distress developed by Simons and Gaher (2005). The scale evaluates distress tolerance based on the individual's ability to tolerate emotional distress, the mental evaluation of distress, the degree of attention to negative emotions in the event of an occurrence, and the regulatory measures to tolerate distress. This scale includes 15 questions and four subscales of emotional distress tolerance, absorption by negative emotions, mental evaluation of distress, and adjustment efforts to reduce distress are categorized. The items are graded on a five-point Likert scale with higher scores indicating higher levels of distress tolerance. The alpha coefficient for the total scale was calculated to be 0.82.

1.1.3.   Renewed Health hardiness Questionnaire

Gebhart, Van der Doef, and Paul (2001) designed the revised health hardiness Questionnaire. The instrument has 24 items, which are graded using a five-point Likert scale (1 = completely opposed to 5 = completely agree). The score is obtained with the total score of the items, so the range of scores is between 24 and 100, and a higher score means higher health hardiness. Gebhart, Van der Doef, and Paul (2001) confirmed the validity of the instrument and reported its reliability with Cronbach's alpha to be 0.78 for the student participants. Also, Ghazi (2015), while confirming the formal and content

validity of the tool through expert opinion, reported a reliability of 0.83. Also, the reliability of the scale in the present study was obtained using Cronbach's alpha to be 0.81.

1.1.4. Health-promoting lifestyle questionnaire (HPLP)

This questionnaire was designed by Walker et al (1987) and consists of 52 phrases that measure 6 dimensions. These six dimensions include nutrition, exercise, health responsibility, stress management (identifying the sources of stress and stress management measures), interpersonal support (maintaining relationships with a sense of closeness), and self-actualization (having a purposeful sense for the pursuit of personal development and the experience of self-awareness and satisfaction). The response spectrum is of the Likert type and Cronbach's alpha coefficient for the overall score of this questionnaire was reported to be 0.94 in Walker et al.'s (1987) study.

Results

Before data analyses, data screening was done to check for any violations of normality, and assumptions of linear regression were analyzed. The scatter plot showed that the assumption of linearity of independent and dependent variables was correctly observed. The results of the Skewness and Kurtosis test as presented in table 1 showed that the assumption is normal (Kline, 2012). However, eighteen outliers were detected and were excluded from subsequent analyses. Hence, the final sample size used for the regression analyses amounted to 517. In addition, the means, standard deviations, and Pearson's r correlations were calculated for all variables (see Tables 1 and 2). The average age of the participants was 16.27 (standard deviation 6.48).

Table 1. Mean and standard deviation of research variables

Kurtosis (SD= 214)	Skewness (SD= 107)	$T (p)$	M±SD))Female	M±SD) Male	) Variable
60/1	80/0-	(001/0) 23/3-	57/4±78/35	57/4±46/34	Corona distress
10/0-	18/0-	(489/0) 69/0	23/6±31/31	71/5±77/31	Spiritual growth and self-actualization
33/0-	22/0	(051/0) 95/1-	04/7±09/34	35/7±77/32	Responsibility for health
25/0-	18/0	(460/0) 73/0-	07/4±22/22	43/4±93/21	Interpersonal relationships
45/0	62/0	(201/0) 28/1-	19/3±73/13	03/3±35/13	Stress management
66/1	62/0-	(49/0) 69/0-	75/3±62/23	53/3±38/23	Health value
32/1	51/0-	(145/0) 460/1-	28/3±49/19	86/2±06/19	Health internal locus of control
96/0	76/0	(959/0) 051/0	77/4±80/15	70/4±82/15	Health external locus of control

22/2	14/1	(771/0) 291/0-	88/2±46/16	51/2±39/16	Health capability
47/2	73/0	(350/0) 935/0-	32/8±38/75	95/7±66/74	Overall health hardiness score
43/0-	25/0	(036/0) 097/2	94/2±88/7	85/2±46/8	Emotional distress tolerance
78/0-	23/0-	(434/0) 782/0	30/3±33/9	96/2±57/9	Absorption by negative emotions
19/0-	29/0-	(453/0) 750/0	27/4±53/18	51/4±84/18	Anxiety assessment
18/0-	41/0	(664/0) 434/0	59/2±92/6	61/2±03/7	Efforts to relieve distress
16/0-	13/0-	(186/0) 325/1	83/9±66/42	80/9±90/43	Overall distress tolerance

As shown in Table 1, the mean and standard deviation for each of the research variables are given in terms of gender. The results of the Skewness and Kurtosis test showed that the assumption is normal. There is no difference between male and female students in terms of the overall score of the variables of health hardiness and distress tolerance and their components. But there is a difference in the overall score for corona anxiety between boys and girls, and female students scored higher on corona anxiety. The next round of analyses focused on examining the correlation coefficient for the variables under study. These results are shown in table 2 below.

Table 2: The results of the normality test of the research variables

SD	Elongation	SD	Skewness	variable
394/0	881/0-	198/0	300/0	Corona distress
394/0	669/0-	198/0	358/0	Spiritual growth and self-actualization
394/0	554/0-	198/0	010/0	Responsibility for health
394/0	029/1-	198/0	262/0	Interpersonal relationships
394/0	579/0-	198/0	427/0	Stress management
394/0	008/0-	198/0	126/0-	Health value
394/0	550/0-	198/0	370/0-	Health internal locus of control
394/0	779/0-	198/0	022/0-	Health external locus of control
394/0	007/1-	198/0	300/0	Health capability
394/0	655/0-	198/0	416/0	Overall health hardiness score
394/0	007/0-	198/0	125/0-	Emotional distress tolerance
394/0	550/0-	198/0	360/0-	Absorption by negative emotions
394/0	778/0-	198/0	027/0-	Anxiety assessment
394/0	006/1-	198/0	301/0	Efforts to relieve distress
394/0	654/0-	198/0	415/0	Overall distress tolerance

As Table 2 shows, the absolute value of skewness for all research variables is less than 3 and the absolute value of kurtosis is less than 10 for all research variables. Therefore, a violation of the assumption of normality is not visible in the data of the present study.

Table 3. The correlation coefficient for the research variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-														
2	50/0**	-													
3	48/0**	40/0**	-												
4	50/0**	42/0**	39/0**	-											
5	40/0**	45/0**	27/0**	41/0**	-										
6	36/0**	33/0**	28/0**	39/0**	60/0**	-									
7	17/0-**	21/0-**	24/0-**	26/0-**	25/0-**	23/0-**	-								
8	30/0**	28/0**	31/0**	27/0**	29/0**	28/0**	65/0-**	-							
9	38/0**	39/0**	34/0**	30/0**	52/0**	50/0**	62/0-**	63/0**	-						
10	29/0**	27/0**	35/0**	24/0**	21/0**	27/0**	25/0-**	28/0**	23/0-**	-					
11	38/0-**	36/0-**	21/0-**	35/0-**	24/0-**	24/0-**	33/0*	34/0-**	21/0**	71/0**	-				
12	30/0**	26/0**	22/0**	23/0**	23/0**	19/0**	27/0-**	36/0**	22/0**	55/0**	60/0**	-			
13	22/0-**	24/0-**	24/0-**	19/0-**	26/0-**	22/0-**	34/0*	25/0-**	19/0**	24/0**	019/0-**	218/0**	-		
14	29/0**	31/0**	28/0**	25/0**	28/0**	31/0**	32/0-**	35/0**	23/0**	83/0**	80/0**	86/0**	42/0**	-	
15	35/0-**	28/0-**	24/0-**	32/0-**	25/0-**	31/0-**	29/0*	31/0-**	27/0-**	25/0**	23/0-**	29/0-**	27/0-**	33/0-**	-

As can be seen in Table 3, there is a significant negative relationship between the variables of spiritual growth and self-actualization (r = -0.35, p <.01), health responsibility (r = -0.28, p <.01), interpersonal relationships (r = -0.24, p <.01), stress management (r = -0.32, p <.01), health value (r = -0.25, p <.01), internal locus of control (r = -0.31, p <.01), health capability (r = -0.31, p <.01), overall hardiness score (r = -0.27, p <.01), emotional distress tolerance (r = -0.25, p <.01), anxiety assessment (r = -0.23, p <.01), efforts to alleviate distress (r = -0.27, p <.01), and emotional distress tolerance (r = -0.33, p <.01) and the corona distress. In addition, there is a positive and significant relationship between the components of the external locus of control (r = 0.29, p <.01) and absorption by negative emotions (r = 0.25, p <.01). Following, regression analysis was conducted based on the variables of distress tolerance, health hardiness, and health-promoting lifestyle.

Table 4. Summary of regression model for the characteristics of Corona distress

Level	Indexes	SS	df	MS	F (P)	R	R^2	Adjusted R	S.E
1	Regression	111/9866	1	111/9866	(001/0 P)	640/0	410/0	409/0	25/5
	Tolerance	473/14202	515	578/27	75/357				
2	Regression	517/681/12433	2	841/6216	(001/0 P)	719/0	517/0	515/0	75/4
	Tolerance	903/11634	514	636/22	64/274				
3	Regression	028/13592	3	676/4530	(001/0 P)	751/0	565/0	562/0	51/4
	Tolerance	556/10476	513	422/20	85/221				
4	Regression	045/14393	4	261/3598	(001/0 P)	773/0	598/0	595/0	34/4
	Tolerance	540/9675	512	898/18	409/190				
5	Regression	733/14533	5	747/2906	(001/0 P)	777/0	604/0	600/0	31/4
	Tolerance	851/9534	511	659/18	78/155				

Based on the results depicted in Table 4, it can be concluded that in explaining the corona anxiety based on the variables of emotional distress tolerance, health hardiness, and a health-promoting lifestyle, R2 equals 0.60 which brings us to the conclusion that the predictor variables explain the corona anxiety score by 60%. The amount of F observed

is significant for all research variables at the level (P≤0.01). In Table 4, the standardized and non-standardized regression coefficients and their significance levels are reported.

Table 5. Results for entering multivariate regression analysis

Variable	B	SE	β	t	P	Collinearity Statistics		(DW)
Step 5 (Constant)	31.270	1.387	-	22.537	<.001	Tolerance	VIF	1.92
Responsibility for health	-1.352	0.115	-0.382	-11.782	<.001	0.738	1.35	
Tolerance of emotional distress	-1.117	0.108	-0.323	-1.341	<.001	0.792	1.26	
Health value	-0.402	0.069	-0.376	-5.855	<.001	0.188	3.31	
Health hardiness	-0.190	0.029	-0.188	-6.526	<.001	0.936	1.06	
absorption by negative emotions	0.392	0.143	0.172	2.746	<.006	0.197	5.08	

As illustrated in table 5, responsibility for health, tolerance of emotional distress, health value, health hardiness, and absorption by negative emotions show a significant amount of variance with Corona Anxiety, $\Delta R2 = 0.60$, $F(5, 511) = 155.781$, p<.001. This significant relationship was negative for variables of health responsibility β=-0.382, p<.001, emotional distress tolerance β=-0.323, p<.001, health value β=-0.378, p<.001, and health hardiness β=-0.188, p<.001, with Corona Anxiety. On the other hand, there was a significant positive relationship between the variable of absorption by negative emotions and Corona Anxiety, β=0.172, p<.001.

Discussion

The objective of the present study was to examine three psychological variables that, based on the existing research background, seemed to be influential in arousing people's anxiety in the face of the coronavirus pandemic. However, very soon, with the advent of the Covid-19 virus in various countries around the world, it became clear that this situation was different from that of any other similar viruses such as Zika, Ebola, swine flu, or SARS. As the present study was being reported, the slogan "Stay at home" had become one of the most serious recommendations of healthcare providers in various countries around the world, and the number of people infected with the coronavirus worldwide has reached two million (April 16, 2020). In Iran, official statistics show that nearly 80,000 people were infected at the same time which is seven times bigger compared to the date on which data collection ended for this study on March 28. However, the findings of the present study show that the psychological factors identified in previous studies are also effective in relieving anxiety caused by the prevalence of corona. As the

results of regression analysis show, the set of predictor variables present in this study explains a total of 60% of the variance in the variable of corona anxiety, which is noticeable in comparison to the 21 percent reported by Blakey and Abramowitz (2017) and the 27 percent in Blakey et al. (2015) regarding the Zika and Ebola anxieties respectively.

Findings show that the severity of corona anxiety can be predicted based on adherence to health-promoting behaviors, tolerance for distress, and health hardiness. Similarly, Liang, et al. (2020) measured the prevalence and the severity of the psychological distress caused by the coronavirus throughout China and reported that 54.8 percent of people experience psychological distress symptoms such as post-traumatic stress disorder (PTSD) and women experience anxiety more than their male components. These researchers suggest that young adults show higher levels of anxiety because they tend to regularly search about the Covid-19 disease information in SNS and people with high educational levels due to their health awareness, also show more psychological distress.

Fischhoff (2020) believes that During the virus prevalence, the fear of getting sick, the fear of death, and the turmoil in everyday activities can even make healthy people experience high levels of anxiety despite not being infected, and this condition creates a set of clinical symptoms such as diminished life expectancy. In times of crisis, life control and predictability are usually reduced (Shigemura & others, 2020) which make people feel less secure in their own life, and as a result, anxiety is the most major characteristic of critical situations, because of its unpredictability of the future, will be increased (Menec & Chipperfield, 2009). People based on their cognitive and behavioral capacity will take an action to tolerate these distressful and vague situations and subsequently, Overdo and underdo health-promoting and self-care behaviors. People with high levels of distress tolerance often have the perceptual capacity to tolerate threatening stimuli (Keough, et al., 2010) and are more likely to engage in self-directed behaviors and improve healthy behaviors. By developing health hardiness in the three dimensions of commitment, control, and struggle, and by increasing their tolerance capacity, they see their health as controllable and consider stressful health factors as a chance to be used for personal growth. Because health hardiness is a belief in oneself, one's future, and one's external world, people with high levels of health hardiness are expected to have a higher level of adaptability to life in the face of critical and life-threatening conditions. These highly-committed individuals are aware of their role and importance in changing circumstances, feeling controlled and efficient about what is happening around them, and struggling instead of feeling threatened and believing that change and evolution is an aspects of nature and life is a response to stressful events (Pollack, 1999).

In this regard, Brooks (2008) believes that people with high health hardiness, by re-evaluating health stressors, while positively evaluating events, use effective coping strategies to combat diseases. WHO, too, emphasizes the importance of health-protective and health-promoting behaviors (Pender, 2002). Health-promoting lifestyle emphasizes innovative and creative ways to maintain and increase health levels (Walker, 1987) and

is recognized as one of the major criteria in the absence of many diseases (Habibi & Others, 2006). In this current situation, uncertainty over the time of disease control and the discovery of the vaccine, quarantine status, and reduced face-to-face interactions can be a major source of anxiety for people and therefore contribute to low mental health. This can be reduced by relying on a health-promoting lifestyle which includes factors such as responsibility, using alternative virtual interactions, managing stress, and improving self-esteem to cope with the psychological turmoil caused by corona.

Conclusion

It should be noted that participants of the study were women and men who didn't observe any of their relatives were infected with Covid-19, between march 11th to march 28th, 2020. In addition, it can be said that participants were chosen from women and men in Fars province which was known as the main center of coronavirus prevalence. Thus it can be said that the main limitation of the present study was that participants, at least during data collection, had no direct experience with Coronavirus. In conclusion, we can say that instead of worrying about the prevalence of Corona, future research should focus on individuals' compatibility with home quarantine, and in particular the impact of coping strategies on their adaptive power.

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