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Prediction of death anxiety through fear of COVID-19, neuroticism, behavioral inhibition system and uncertainty intolerance

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Abstract

Introduction: Due to the increasing rate of COVID-19 disease, experiencing high levels of death anxiety is predictable all over the world. Therefore, the aim of the present study was to investigate the prediction path of death anxiety through fear of COVID-19, neuroticism, behavioral inhibition system, and uncertainty intolerance.

Materials and Methods: The research design of this study was descriptive-correlation and of structural equations type. The statistical population of this study included Iranian adults from whom, 400 were selected by the convenient sampling method. Data were collected in July and August 2020 using the Templer Death Anxiety Scale (TDAS), Fear of COVID-19 Scale (FCV-19S), Neo Five-Factor Inventory short form questionnaire (NEO-FFI), the Behavioral Inhibition System/Behavioral Activation System Scale (BIS/BAS Scale), and Intolerance of Uncertainty Scale, in Mashhad- Iran. Data analysis was performed using the Pearson correlation method, path analysis, SPSS version 26, and AMOS version 24.

Results: The results showed that there are significant relationships between death anxiety with fear of COVID-19 ($P< 0.01$), and neuroticism ($P< 0.01$); between behavioral inhibition system with intolerance of uncertainty ($P< 0.01$); and between Intolerance of uncertainty with death anxiety ($P< 0.01$). Also, the path of predicting death anxiety through neuroticism, behavioral inhibition system and intolerance of uncertainty was confirmed at the level of 0.001 and the path was significant.

Conclusion: Based on the findings, death anxiety is predicted by the path of fear of COVID-19, neuroticism, behavioral inhibition system, and uncertainty intolerance.

Keywords: Behavioral Inhibition System, COVID-19, Death anxiety, Fear, Neuroticism

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Introduction

On March 11th 2020, after the increasing spread of the COVID-19 virus, World Health Organization declared the disease an epidemic (1,2). COVID-19 is one of the most important pathogenic agents that primarily target the

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human respiratory system (3). Due to the very high increase in the prevalence of this disease and the lack of proper and definitive treatment for this disease, experiencing high levels of stress and anxiety is predictable all around the world (2), in a way that some agents such as fear of contracting it, spread of false news and rumors, fear of death, prohibitions or traffic restrictions, interference in daily activities, occurrence of financial and occupational problems, reduction of social interactions and dozens of agents related to these conditions, have caused much fear and anxiety; and according to the present research evidences, one of these items, is death anxiety (4,5). The North American Nursing Diagnosis Association, defines death anxiety as a feeling of unsafe, anxiety or fear regarding death experience or near-death experience (6).

This kind of anxiety is a conscious or unconscious mental state that arises as a result of a defense mechanism and can be triggered by death and survival threats (6). The COVID-19 pandemic has created unique challenges for humans because it is a constant reminder of death. Newton et al. showed that the ever-present images of death, the constant transmission of this virus from one person to another, people committing suicide, and the masks that are constantly on the faces; means that we are in a prominent era of global death anxiety (7).

Recent studies have introduced neuroticism trait as one of the cases that has been able to predict death anxiety in the era of COVID-19 (9). These studies have shown that in the stressful conditions of the COVID-19 era, people will experience this trait to a greater extent; in a way that high levels of neuroticism is predicted by fear of COVID-19 (8,9); and this can be an important vulnerable agent of most emotional problems that the fear caused by COVID-19 has increased its intensity (8,10).

On the other hand, previous studies have shown that there is a relationship between this type of anxiety and behavioral inhibition and behavioral activation systems (5,11). The basic brain system called the behavioral inhibition system. It controls behavior and emotion and responds to stimuli related to punishment or deprivation of reward and leads to behavioral withdrawal or arousal. During risk assessment, the behavioral inhibition system creates and maintains people's motivation to deal with that risk (12). But very high sensitivity in this system, will lead to widespread negative effects, especially anxiety and also anxiety disorders (6,13).

One of the cognitive components that can be influenced by neuroticism trait (14) and the behavioral inhibition system (15), which has intensified during the COVID-19 era (16), is uncertainty intolerance. This transdiagnostic component is a kind of cognitive bias that affects how a person perceives, interprets and reacts to an uncertain situation at the emotional, cognitive and behavioral levels (17) and it is a set of negative beliefs about uncertainty that causes a person's inability to act. The pattern of uncertainty intolerance shows that anxious people perceive uncertain or ambiguous situations as stressful and disturbing, therefore in response to such situations, they experience chronic worry. These people believe that being worried helps them to deal with frightening situations or prevent these incidents from happening in an efficient way (18).

Due to the spread of covid-19, which has led to a lot of tension and anxiety in people today, the necessity of more studies on personality traits and behavioral brain systems that predict anxiety and uncertainty intolerance caused by this era is felt; because knowing how the cognitive distortion activity, uncertainty intolerance related to the personality traits, and the behavioral brain system related to it, can help people to control stressful events and negative affects well (19,20) and reduce the death anxiety caused by these situations; so, considering that the search of the present study researchers, shows that the interactive effect of fear of COVID-19 with neuroticism, behavioral inhibition system, and uncertainty intolerance in death anxiety, has not been investigated in any of Iranian and foreign researches, in this article, an attempt has been made to examine the route of fear of COVID-19 to death anxiety with the mediating role of neuroticism trait, behavioral inhibition system and uncertainty intolerance. The results of this study can be effective in better understanding the psychological effects of the COVID-19 epidemic and also improving people's mental health.

Materials and Methods

This study with the ethics code of IR.UM.REC.1400.101 was extracted from the thesis and approved by the Ethics Committee of Ferdowsi University of Mashhad. Since the

present study sought to predict death anxiety through the route of fear of COVID-19, neuroticism, behavioral inhibition system and intolerance of uncertainty; descriptive correlation and route analysis was chosen as the overall scheme of the present study. The statistical population included all adults living in Mashhad who had adequate access to the internet and social media at the time of sampling. Meanwhile, based on the type of statistical method that was used and taking into account 25% sample loss and the effect size of 0.15 as the average effect size according to the type of statistical method that was used (complete linear regression model and route analysis), using G-power application, The minimum sample size was determined as 300 people; but with the aim of increasing the similarity of the current sample with the target population, improving the potency of the test and increasing the generalizability of the results, 400 people were selected as samples using the convenient sampling method. Also, because this study was conducted during the outbreak of the COVID-19 and the lack of in-person access to people, sampling was done through an internet questionnaire. The inclusion criteria included having at least a middle school degree, not having an acute medical and psychiatric problems, and willingness to participate in the research. The exclusion criteria included no willingness with cooperation, and the incomplete questionnaires.

Research instruments

A) Demographic checklist: In this section, personal information including gender, age, level of education, marital status, history of physical and psychological problems, and ways of reconnection for sending the research results were collected.

B) Templer Death Anxiety Scale (TDAS): This questionnaire has 15 items. It was created by Templer in 1970 to assess the level of death anxiety. Subjects indicate their answers to each item by choosing "yes" or "no". The total scores of the questionnaire range from 0 to 15, and according to studies, scores from 0 to 7 indicate low death anxiety and scores from 8 to 15 indicate high death anxiety. The revalidation coefficient of the scale is 0.83 and its concurrent validity is reported based on the correlation with the manifest anxiety scale of 0.27 and with the depression scale of 0.40 (21). Rajabi and Bahrani standardized this questionnaire in Iran and reported its reliability coefficient of 0.62 and internal consistency coefficient of 0.73 (22). Cronbach's alpha of this questionnaire was calculated at 0.77 in the present study.

C) Fear Of COVID-19 Scale (FCV-19S): Fear of COVID-19 questionnaire was developed by Ahorso et al. in 2020 to measure the level of people's fear of COVID-19. This questionnaire has 7 items and based on a five-point Likert scale, it is scored between 1 and 5; therefore, the score obtained for each person in this questionnaire will be between 7 and 35, and the higher this score is, the greater the fear of the COVID-19 in the person will be. The correlation between these items has been reported from 0.66 to 0.74. The obtained Cronbach's alpha coefficient is 0.82 (23). To obtain the validity of this scale, the test-retest and simultaneous validities were used, the test-retest validity was 0.72 and the concurrent validity of this scale, with the depression and hospital anxiety scales, were 0.425 for the depression component and 0.511 for the anxiety component, respectively (23). Cronbach's alpha of this questionnaire was calculated as 0.82 in the present study.

D) NEO Five Factor Inventory, short form (NEO-FFI): The NEO questionnaire is one of the most reliable questionnaires related to the investigation of personality structure based on factor analysis perspective (24). This test was first developed in 1985 by Costa and McCrae and then revised in 1992. The short form of this questionnaire is widely used to evaluate 5 main factors of personality; i.e., Neuroticism (N), Extroversion (E), Openness to experience (O), Agreeableness (A), and Conscientiousness (C). In each question, the subject gets a score between 0 and 4 on a five-point Likert scale. However, scoring is not the same in all items and some items in this form are graded in reverse. Each of the items includes 12 questions. Costa and McCrae reported the Cronbach's alpha coefficient of this questionnaire to be between 0.68 for agreeableness component and 0.86 for neuroticism component (25). The standardization of this tool in Iran has been done by Delavar, Baratian and Kashef through checking the construct validity, concurrent validity, divergent validity, reliability. They showed that this questionnaire has acceptable psychometric properties, so that the Cronbach's alpha coefficient for the psychological irritation

component was equal to 0.86 (26). Also, Cronbach's alpha of this questionnaire was calculated at 0.86 in the current study.

E) Behavioral Activation and Inhibition Systems Scale (BAS/BIS Scale): This tool has 24 items and it was developed by Carver and White in 1994. The Behavioral Inhibition System (BIS) subscale in this questionnaire includes 7 items (questions 2, 8, 13, 16, 19, 22, and 24) and measures responding to threats and feeling anxious when facing threats. Items 1, 6, 11, and 17 don't play a role in scoring, and questions 2 and 22 have reverse scoring. According to Carver and White's report, the internal consistency of the behavioral inhibition system scale is 0.73 and the internal consistency of the three components of drive, sensitivity to reward, and entertainment seeking are 0.76, 0.73, and 0.66 respectively (27). In a research, Cronbach's alpha coefficient was 0.78 for the behavioral inhibition system subscale and 0.81 for the behavioral activation system subscale (28). Also, in Iran, in Mohammadi's research in 2017, Cronbach's alpha coefficient was reported as 0.78 for the whole scale and 0.69 for the behavioral inhibition system subscale (29). Test-retest reliability for the BIS subscale has been reported as 0.71 (30). Also, Cronbach's alpha of this questionnaire was calculated at 0.72 in the present study.

F) Intolerance of Uncertainty Questionnaire (IUS): Freeston et al. (1994), developed this questionnaire to measure people's tolerance against unreliable and uncertain situations. This scale has 27 questions. Intolerance of uncertainty considers four characteristics important in separating anxious people from healthy ones: low ability to tolerate ambiguous situations, positive beliefs about worry, cognitive avoidance, and negative orientation toward problem. This scale is scored on a 5-point Likert scale (from 1= absolutely false to 5= absolutely true). The sentences of this questionnaire explain the type of people's reaction to life's uncertainties. The validity of this test has been reported satisfactory by Freeston et al. (1994) (31). Buhr and Dugas (2006) prepared and validated its English version (18). The correlation coefficient of this scale with worry questionnaire (r= 0.60), Beck depression scale (r= 0.59) and Beck anxiety scale (r= 0.55) has been obtained at a significant level of 0.001 (18). Buhr and Dugas (2002) reported its test-retest reliability coefficient to be 0.74 at a 5-week interval. Also they reported the Cronbach's alpha coefficient obtained for this scale as 0.94 (18). In the research by Hamidpour, Andooz, and Akbari, the retest reliability (at a 3-week interval) was obtained as 0.76 for this scale (32). The reliability of the scale is reported to be 0.79 by the re-test method (33). Also, Cronbach's alpha of this questionnaire was calculated as 0.91 in the present study.

The data of this study was collected from all adults who were interested and volunteered to participate in the research through an online questionnaire (Google Form, between July and August 2020). Therefore, the web link to the questionnaire was sent to the people who expressed their desire and also had the necessary criteria to participate in the research, so that they could complete the questionnaire whenever they had the opportunity. To be exact, the link of the questionnaire along with the explanation of the research objectives were sent to the people, and those who were interested in cooperation clicked on the link, opened the present questionnaire page and proceeded to complete it. This questionnaire took an average of 10 to 15 minutes to be answered. Then the collected information was put into the statistical software, and descriptive statistics methods including mean, frequency and standard deviation, the lowest and highest score, and Pearson correlation were used to analyze the research data, and also to analyze the research hypotheses, route analysis was used. Also, confirmatory factor analysis was obtained for all questionnaires and the construct validity of the questionnaires was confirmed. Data were analyzed using SPSS version 26 and AMOS version 24.

To maintain the principle of confidentiality, the information obtained from the questionnaires was collected without the names and addresses of the subjects so that their identities are protected and only available to those involved in this research. Also, gaining the subjects' trust and assurance to participate in the research and voluntarily participation were among other ethical considerations.

Results

The demographic characteristics of the participants are shown in Table 1. The final analysis was done on 400 cases. The mean, standard deviation, and correlation coefficient matrix of research variables are presented in Table 2.

Table 1. Demographic data of the research participants

Variables		Number	Percentage
Gender	Male	94	23.5
	Female	306	76.5
Marital status	Single	255	63.8
	Married	145	36.3
Level of education	Diploma	9	2.3
	Associate degree	263	65.8
	Bachelor's degree	107	26.8
	Masters degree and higher	21	5.3
Age (Year)		Average	The standard deviation
		27.09	10.36

Table 2. The mean, standard deviation, and correlation coefficient matrix between research variables

Variable	Mean	SD	1	2	3	4	5
1. Fear of COVID-19	16.39	4.99	1				
2. Neuroticism	24.98	8.37	0.29**	1			
3. Behavioral inhibition	19.3	2.52	0.37**	0.53**	1		
4. Intolerance of uncertainty	84.60	16.79	0.30**	0.53**	0.41**	1	
5. Death anxiety	6.65	1.87	0.28**	0.09**	0.08	0.25**	1

** $P< 0.01$

As Table 2 shows, there is a positive and significant correlation between fear of COVID-19 and death anxiety (r= 0.28), between fear of COVID-19 and neuroticism (r= 0.29), between fear of COVID-19 and behavioral inhibition system (r= 0.37), and between fear of COVID-19 and intolerance of uncertainty (r= 0.30). Also, there is a significant positive relationship (r= 0.29) between neuroticism and behavioral inhibition system (r= 0.53) and between neuroticism and uncertainty intolerance (r= 0.38). Also, a positive and significant correlation was observed between behavioral inhibition system and intolerance of uncertainty (r= 0.53), and between intolerance of uncertainty and death anxiety (r= 0.25).

After analyzing the descriptive data, route analysis was used to analyze descriptive findings. Before presenting the route analysis results, the regression assumptions were checked. In order to check univariate outlier data, box plot and Q-Q chart were used and to check multivariate outlier data, Mahalanobis was used, and the results showed that there is no univariate and multivariate outlier data in the research variables. Durbin-Watson test was used to check the independence of the residuals, and its value was equal to 1.86, which shows that the premise was met.

Multi-collinearity of the variables was investigated using the tolerance statistic and the variance inflation factor. Examining the tolerance statistics (less than 0.1) and the variance inflation index (more than 10) indicated that the tolerance values obtained for the variables are above 0.10 and the value of the variance inflation index obtained for the variables is smaller than 10. This shows that there is no multi-collinearity between the variables. Therefore, route analysis was used to investigate the relationship between the variables of fear of COVID-19, neuroticism, behavioral inhibition system, and intolerance of uncertainty with death anxiety. Figure 1 shows the route analysis diagram of the final model and Table 3 shows the fit indexes of the final model in the target sample.

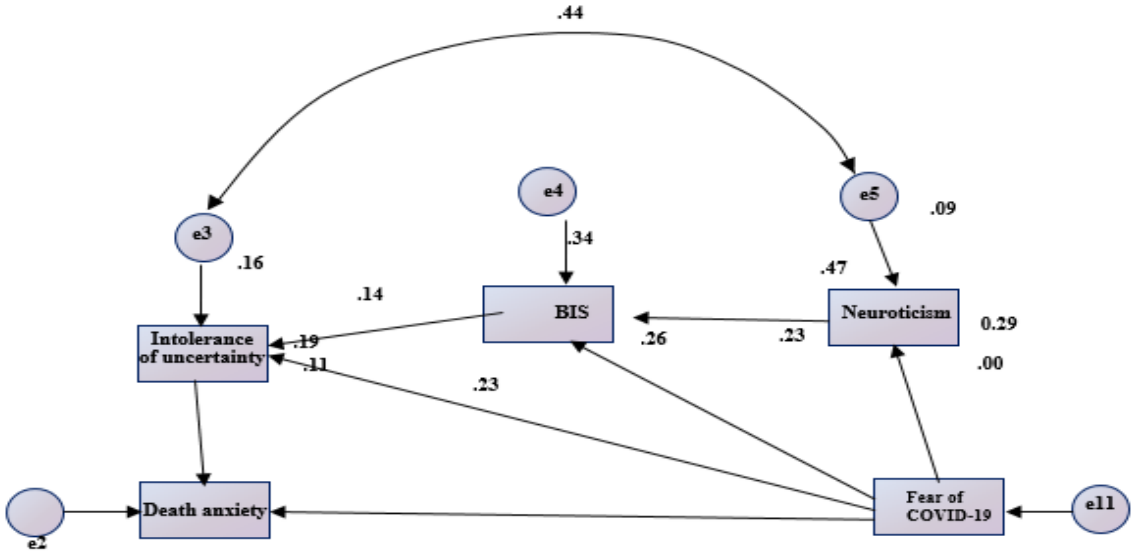

Figure 1. The output model of the mediating role of neuroticism, behavioral inhibition system and intolerance of uncertainty in the relationship between fear of COVID-19 and death anxiety

Table 3. Fit indexes of the model

Fit index	χ2	df	χ2/df	RMSEA	GFI	AGFI	IFI	CFI	NFI
Favorable limit			≤ 3	≤ 0.08	≥ 0.9	≥ 0.9	≥ 0.9	≥ 0.9	≥ 0.9
The final model	5.07	2	2.53	0.06	0.99	0.96	0.99	0.99	0.98

Table 3 shows that the fit indexes of the final model that includes Chi-square index (χ2= 5.07), relative Chi-square (χ2/df= 2.0853; *P*= 0.0853), Goodness of Fit Index (GFI)= 0.99, Adaptive Goodness of Fit Index (AGFI)= 0.96, Comparative Fit Index (CFI)= 0.99, Incremental Fit Index (IFI)= 0.99, and Root Mean Square Error of Approximation (RMSEA) = 0.06, demonstrates the optimal fit of the model.

All routes were significant. Therefore, the model in Figure 1 has a good fit.

In order to determine whether neuroticism, behavioral inhibition system, and intolerance of uncertainty have a mediating role in the relationship between fear of COVID-19 and death anxiety, the bootstrap method was used to specify indirect effects. Tables 4 and 5 present the direct and mediating effects of each of the routes of the model.

Table 4. Parameters of measuring direct relationships in the model

Routes	Non-standard estimate	Standard estimate	The standard error	Critical ratio	P
Fear of COVID-19 to neuroticism	0.49	0.29	0.08	6.12	0.001
Fear of COVID-19 to uncertainty	0.86	0.25	0.16	5.17	0.001
Fear of COVID-19 to BIS	0.11	0.23	0.02	5.48	0.001
Fear of COVID-19 to death anxiety	0.08	0.22	0.01	4.56	0.001
Neuroticism to BIS	0.14	0.46	0.01	11	0.001
BIS to uncertainty intolerance	0.90	0.13	0.33	2.66	0.008
Intolerance of uncertainty to death anxiety	0.02	0.18	0.006	3.79	0.001

As can be seen in Table 4, the standard coefficients of the routes of fear of COVID-19 to neuroticism (0.29), neuroticism to Behavioral Inhibition System (BIS) (0.46), BIS to intolerance of uncertainty (0.13) and intolerance of uncertainty to death anxiety (0.18) are significant. As shown in Table 5, fear of COVID-19 to death anxiety is significant through neuroticism, behavioral inhibition system and intolerance of uncertainty (*P*< 0.05). Therefore, the mediating role of neuroticism, behavioral inhibition system and intolerance of uncertainty is confirmed.

Table 5. Bootstrap results for testing indirect relationships in the model

Routes	Standard value	Standard error	Lower limit	Upper limit	P
Fear of COVID-19 → Neuroticism → Behavioral inhibition system → Intolerance of uncertainty → Death anxiety	0.05	0.01	0.03	0.17	0.001

Discussion

The purpose of the present study was to investigate the mediating role of neuroticism, behavioral inhibition system and intolerance of uncertainty in the relationship between fear of COVID-19 and death anxiety. The findings showed a significant relationship between fear of COVID-19 and death anxiety, between fear of COVID-19 and neuroticism, between fear of COVID-19 and behavioral inhibition system, between neuroticism and behavioral inhibition system, between behavioral inhibition system and intolerance of uncertainty, and between intolerance of uncertainty and death anxiety. Also, the findings showed that fear of COVID-19 could predict death anxiety through the mediating role of neuroticism, behavioral inhibition system, and intolerance of uncertainty.

The results showed a significant relationship between fear of COVID-19 and death anxiety. This finding is in line with some previous studies. For example, in the study by Lee et al. on the relationship between fear of COVID-19 and death anxiety on a sample of 453 people, the results of hierarchical multiple regression analysis showed that the concept of death anxiety has been growing recently and fear of COVID-19 can predict widespread anxiety along with death anxiety (9).

Also, in the research by Asghari Ebrahim Abad et al. in Iran to investigate the relationship between fear of COVID-19 and death anxiety on a sample of 605 people through correlation and route analysis, the findings indicated that those who experienced more fear during the COVID-19 era, reported more higher levels of death anxiety in dealing with the COVID-19 (5). To explain this finding, it can be said that since the death toll of people infected with the COVID-19 is increasing day by day (34) and the continuous epidemic reports by the media, mental problems related to distress such as anxiety, depression and insomnia have increased (35,36). As a result, these factors can lead to higher levels of fear of dying in people and therefore, increase their anxiety, including death anxiety caused by the COVID-19 (9).

Also, the results showed that the fear of COVID-19 is related to neuroticism. This research finding is in line with the results concluded by Caci et al. They investigated the interaction between neuroticism, fear of COVID-19, boredom, fantasy conflict, and perceived control over time on 301 people. The results of the structural equation model showed that the fear of COVID-19 has a significant relationship with neuroticism (37). In Troisi et al. study on 101 health care professionals, the results showed that the fear of COVID-19 system is related to neuroticism (38). To explain this relationship, it can be said that neurotic people show more emotional reaction in stressful situations and have fewer resources to help with managing stress; therefore, if there are conditions where it is impossible to control the situation, such as during the COVID-19 era, these people tend to develop fear and anxiety and the experiencing of negative mood (38).

Also, the results showed that the fear of COVID-19 is related to the behavioral inhibition system. This finding is in line with the results of previous researches. For example, in a study, the results of hierarchical regression analysis showed that negative experiences such as fear and anxiety predict an active behavioral inhibition system (39). In Yan and Dillard's research, on 305 students of the University of Pennsylvania, the results of one-way analysis of variance showed that when experiencing fear and anxiety, people obtain high scores in the behavioral inhibition system (40).

In this regard, Asghari Ebrahim Abad et al. studied 605 people in Iran through the route analysis method. They showed that the fear of COVID-19 is related to the behavioral inhibition system (5). To explain this finding, it can be said that since in the conditions of COVID-19, many fears are plaguing people, people develop behavioral restrictions to take care of themselves, including occupational and social restrictions; and they spend more time at home. As a result, they experience an active inhibition system.

Also, the findings showed that neuroticism is related to the behavioral inhibition system. This

finding is in line with the results of the research by Thake and Zelenski on 166 students. They found that neuroticism predicts a high level of behavioral inhibition system (41). Also, in the research by Smits and Beock on 390 students, it was shown that irritability is related to the behavioral inhibition system (42). To explain this finding, according to Gray's theory, it can be said that neurotic people have a more active right hemisphere, and experience low emotional intelligence, negative affect and emotion, and lower mood (43). Also, these people have avoidant personalities. In these people, the great activity of the right septo-hippocampal circuit makes people compare the existing conditions with their expectations, and if there is a conflict, their behavioral inhibition system is activated and they stop the behavior (12,44-49).

Also, the results showed that the behavioral inhibition system is related to intolerance of uncertainty. This finding is in line with the results of previous researches. Alizadeh et al. investigated the predicting anxiety related to behavioral inhibition and activation systems, emotional cognitive regulation strategies and intolerance of uncertainty on 200 people. The results of variance analysis and step-by-step regression showed that there is a significant positive correlation between the variables of behavioral inhibition system and intolerance of uncertainty (50).

To explain this finding, it can be said that considering the fact that great activity of behavioral inhibition system is associated with emotional restraint and also keeping people at home during the COVID-19 era, people will limit their actions and as a result of this behavioral restriction, they will experience more anxiety; since anxiety increases ambiguity and worry regarding the future, it can be said that intolerance of uncertainty increases.

In addition, the results showed that intolerance of uncertainty is related to death anxiety. In Bulut's research, on 478 people, the results of the bootstrapping method showed that intolerance of uncertainty plays a mediating role in the relationship between COVID-19 anxiety and fear of death. Also, intolerance of uncertainty was a key variable in the relationship between COVID-19 anxiety and fear of death (51). To explain this finding, it can be said that since intolerance of uncertainty is a cognitive error that leads to excessive worry about an uncertain future situation, people interpret any physical symptoms exaggeratedly during the COVID-19 era, and they will experience high levels of death anxiety.

The important finding of the present study was the role of fear of COVID-19, neuroticism, behavioral inhibition system, and intolerance of uncertainty in predicting the level of death anxiety. Why do neurotic individuals with more active behavioral inhibition system and higher intolerance of uncertainty experience higher levels of death anxiety?

One explanation can be that health concerns and related anxiousness caused by COVID-19 can develop significant psychological impacts on people, such as stress and uninvited negative thoughts, low mood, and impulsiveness, which are a set of psychological traits. They lead to an ineffective preventive behavior and a kind of behavioral inhibition that may have no beneficial prevention, from a scientific point of view, and causes the cognitive error of intolerance of uncertainty. So the person interprets any physical symptoms exaggeratedly and gets excessively concerned about the future and its long-term adverse consequences; among these long-term adverse consequences is death anxiety (9).

To extend the findings of this research, its limitations should always be considered. Among the limitations during the implementation of the research was the increase in the spread of the COVID-19 in Iran and the non-face-to-face nature of most of the activities. So, the researchers implemented the questionnaires electronically, and not in-person. As a result, people who did not have access to the internet were not included in this study. Another limitation was the use of self-reporting tools, which always raises concern over the honesty and accuracy in answers, because there is a possibility that people are biased in this situation.

However, the results of the present study regarding the significant relationship between fear of COVID-19, neuroticism, behavioral inhibition system, and intolerance of uncertainty as well as the interactive role of these four variables in predicting death anxiety are worthy of reflection and require further studies.

By applying specific cognitive tests regarding behavioral inhibition and activation systems and evaluating cognitive skills, more accurate findings can be obtained regarding the underlying factors of this relationship.

Conclusion

The present study predicts death anxiety by showing the mediating role of neuroticism, behavioral inhibition system, and intolerance of uncertainty related to the level of fear of COVID-19. Therefore, interventions based on introducing some preventions related to COVID-19 infection, to reduce people's fear of contracting it, and to inform them about the types of personality traits, as well as the specific way in which their behavioral inhibition system functions and the types of cognitive errors related to the action of traits and the function of the behavioral brain systems in this era plus the following results, can be considered as prevention programs to help people overcome experiencing death anxiety.

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