Research Article

Determining the Relationship and Predictive Contribution of Personality Traits and Self-Concept to Cyberchondria during the Coronavirus Disease 2019 Pandemic

Fariba Tabe Bordbar*

Department of Psychology, Payam Noor University, Iran

Abstract

Background: Cyberchondria is a form of anxiety characterized by excessive searching of online medical content about health, which in most cases results in increased psychological helplessness, worry, and unnecessary medical expenses.

Objective: This research aims to determine the relationship and predictive contribution of personality traits to cyberchondria during the coronavirus disease 2019 (COVID-19) pandemic.

Methods: The research method is descriptive and of correlational designs. The statistical population includes all women and men of the city of Shiraz in 2021 who voluntarily responded online to the cyberchondria scale, the personality dimensions inventory, and the self-concept questionnaire. Data analysis was performed with Pearson's correlation coefficient and stepwise multiple regression using SPSS software version 22.

Results: The research findings showed a significant correlation between personality dimensions and self-concept. Also, according to beta coefficients, self-concept and neuroticism as personality traits predict cyberchondria.

Conclusion: Some personality traits, especially neuroticism, are among the facilitating factors that can contribute to the creation or continuation of mental and behavioral disorders. On the other hand, the presence of negative self-concept in combination with personality factors can help aggravate disorders such as cyberchondria by creating unhealthy behaviors.

Keywords: Self-concept; Personality trait; Cyberchondria; COVID-19

Introduction

The coronavirus disease 2019 (COVID-19) has brought people around the world, with a population of about 6.2 million, to a situation that nobody was familiar with. The rapid growth of this infectious disease and its high mortality has put many people in a miserable psychological state so that permanent anxiety resulting from the fear of death of oneself and others, fear of losing one's job, fear of contracting the disease, and other fears have placed a person in a state of post-traumatic stress disorder, which in turn leads to an increase in feelings of loneliness and despair, obsessive thoughts and behaviors, especially in the field of searching for medical information and even hypochondria. It seems that many individuals use the Internet to learn how to stay healthy, search for potential health threats and risks, self-diagnosis, and get reassurance about their health status. Thousands of health and disease-related websites provide individuals with much information that ranges on a continuum from understandable and reliable content based on scientific research to ambiguous,

threatening, dangerous, or catastrophic content [1].

Although searching for medical information on the Internet is a very normal thing in life, in some cases, excessive and frequent searching and uncertainty in the accuracy of the obtained information have been associated with unfortunate psychological consequences such as increasing the level of anxiety and hypochondria [2].

Cyberchondria is a form of anxiety characterized by excessive searching for medical information on the Internet [3]. Cyberchondria can be considered one of the emerging challenges in the Internet age. Although these searches are done to reduce anxiety and distress about health, contrary to expectations, the results cause the symptoms to worsen. According to White and Horowitz [4], cyberchondria refers to the unfounded intensification of worry and anxiety regarding the identification of general symptoms of the disease based on browsing the search results and texts available on the web. According to recent research, health-related websites have shown significant growth in increasing Internet traffic, or in other words, data flow. For example, the number of users of such websites has significantly increased in recent years [5]. Also, studies have shown a strong relationship between cyberchondria and various variables, including high levels of intolerance and uncertainty, anxiety sensitivity and negative attitude, low self-esteem, and low metacognitive beliefs [6,7]. Therefore, it is necessary to check whether all people are affected by cyberchondria to the same extent or whether some personality traits and types are more ready to suffer from it because, according to Starcivis and Berl [8], personality traits can play an important role in the creation of cyberchondria. This assumption is consistent with confirming the correlation between personality traits in the five-factor model and different types of psychopathologies [9,10].

*Corresponding author: Fariba Tabe Bordbar, Department of Psychology, Payam Noor University, Shiraz, Iran, E-mail: tabebordbar@pnu.ac.ir

Among the comprehensive models in the field of personality, we can refer to McCree and Costa's five-factor personality model [11], which divides individuals' personality into 5 dimensions, including neuroticism (the tendency of individuals to experience anxiety, tension, hostility, shyness, irrational thinking, depression, and low self-esteem), extroversion (an individual's tendency to direct his/her attention and energy to the world outside himself/herself, pay attention to other people, and enjoy interacting with others), openness (an individual's active search to benefit from the experiences of others and an individual's attraction to curiosity, love for art, imagination, enlightenment, and innovation), agreeableness (the tendency of individuals to respect others and the ability of individuals to organize, having a lot of agreement and coordination), and conscientiousness (stability, control, and motivation in purposeful behaviors and tendency to competency, order, striving for progress, self-restraint, and reflection) [12]. Available empirical evidence shows that high neuroticism, low extroversion, low conscientiousness, low empiricism, and low agreeableness are closely related to health anxiety disorders, obsessive-compulsive symptoms, depression, and health-related information-seeking behaviors such as cyberchondria [13-15].

Another effective factor in psychological health is self-concept and self-worth [16]. According to Rogers, self-concept is the general image that a person has of himself/herself, which is acquired through social relationships. In fact, according to Rogers, a person reaches a concept of himself/herself through his/her interactions in the environment with those around him/her and the evaluations that others make about him/her, which is self-concept [17]. Self-concept is the mental image of each person and includes all his/her perceptions (appearances, values, and beliefs) impacting an individual's behavior and referring to the time when the individual uses the word "I". In other words, self-concept is a person's general view of himself/herself and includes all the positive and weak points of a person. Maintaining and evaluating each person's self-concept is a continuous and endless process [18]. According to the vulnerability model to diseases, low or negative self-concept is considered a factor for vulnerability to psychological disorders, which can be both the cause of the disease and its consequence. Overall, the available literature in this field suggests that low self-concept is a risk factor for Internet-related problems, such as excessive Internet use [19], difficulty controlling Internet use [20], and even Internet addiction [21-23].

Orth et al. [24], in their research entitled "Investigating self-concept and mental health", found that self-concept was effective in individuals' mental health in such a way that positive self-concept improved mental health and, on the other hand, negative self-concept led to the individual's increased emotional problems. In another study by Qingfu et al. [17], the results also showed a significant relationship between health statuses, such as psycho-social status, sadness, and self-concept. The results of a research conducted by Martin et al. [25] entitled "Investigating the relationship between self-concept and personality traits" in 2021 showed the direct roles and effects of the dimensions of neuroticism, extroversion, and conscientiousness on self-concept, which is consistent with the results of Rahmatzadeh and Rezakhani's [26] study.

In justifying the relationship between cyberchondria and self-concept, research evidence shows that individuals with negative or low self-concept may feel more comfortable in an online environment compared to a physical encounter with a doctor because, in the face-to-face mode, an individual will probably be exposed to challenging questions that may be difficult to answer for someone with low self-confidence or self-concept. On the other hand, in the virtual space, it is possible to check the content and the signs as many times as needed, so a person will be more eager to use that space [27,28].

The results of a research conducted by Bajcar and Babiak [1] entitled "Investigating the relationship between cyberchondria and personality traits (neuroticism)" showed that excessive use of the Internet and health concerns and compulsive behaviors are more prominent among individuals with low self-concept. These findings indicate that low self-esteem, health anxiety, and obsessive-compulsive symptoms can be considered vulnerability factors for cyberchondria.

Although there is not much research on the role of self-concept during COVID-19 (quarantine) period, the examination of this variable in critical situations such as refugees or even patients hospitalized for a long time shows that when mental preoccupations about health are high, it is likely to reduce by causing depression and a sense of isolation in the individual's self-concept; therefore, positive self-concept can act as a psychological buffer [29]. By creating physical and mental problems at the individual level and economic and collective problems, COVID-19 has caused many problems in the relationship between the individual and society [30]. It seems necessary to conduct more research on its negative consequences, considering the emerging nature of this disease. On the other hand, the increasing emergence and expansion of the web has created many opportunities in the field of searching and obtaining information so that the people of the society can fulfill many of their information needs in various fields, including health and disease information, through Internet resources. Along with these opportunities, challenges have also emerged. Considering the persistence of this disease in the world and the country, examining important psychological factors can help prevent its negative consequences. A detailed examination of psychological characteristics during crises can lead to the formulation of better treatment or prevention models to improve the quality of life and psychological empowerment. Investigating intrapersonal variables will lead to a better understanding of cyberchondria by creating new insight into etiology. Therefore, this research aims to determine the relationship and predictive contribution of personality traits and self-concept to cyberchondria during the COVID-19 pandemic.

Materials and Methods

The current research is practical in terms of purpose and of descriptive-correlational type by the regression method in terms of subject. The statistical population of this research included all men and women of the city of Shiraz. According to Tabachnik and Fidel, the presence of eight participants for each predictor variable plus 50 is a suitable method to determine the sample size in predictive studies, and according to this formula, the sample is large enough. Four hundred completed questionnaires were received, and the data of 385 people were usable. The inclusion criteria of the participants in the research included consent to cooperate, having at least 20 years of age, an education level of at least a diploma, and the ability to use web pages and search. The exclusion criterion included not completing the questionnaire and limited and incomplete questionnaires. For the ethical considerations of conducting the research, consent was obtained from the participants before completing and starting to answer a question. Confidentiality was assured about the information.

Measures

The Cyberchondria Severity Scale (CSS): This scale, developed

in 2014 by McElroy and Shevlin, is a 33-item self-report scale that assesses anxiety and behaviors related to online health information searches. Participants are asked to read the statements and rate the degree to which each statement is commonly used on a 5-point Likert scale (1=never, 2=rarely, 3=sometimes, 4=often, 5=always). In addition to the total score, this scale includes 5 subscales, including the compulsion factor (reflecting the component that online search for health topics can hinder both online and offline activities of a person); the distress factor (reflecting the emotional states associated with online health search); the extravagance factor (reflecting the search for information through multiple sources and multiple cases and situations); the reassurance factor (recalling the prominence of anxiety caused by the online search for information that leads to the search for expert opinions); and the distrust in the medical profession factor (indicating whether the validity of the information obtained online is more than the information obtained from the medical profession or not). The reliability and validity of this tool have been reported appropriate in Fergus [31] and Noor et al. [14] studies. The findings obtained from Sarafraz et al. [32] study have reported a four-factor scale whose reliability coefficients according to Cronbach's method for the subscales of compulsion, extravagance, reassurance, distress, and distrust in the medical profession have been obtained at 0.62, 0.87, 0.83, 0.79, and 0.87, respectively.

The Neuroticism, Extraversion, and Openness, Five-Factor Inventory (NEO-FFI): This questionnaire is a personality test in two long and short forms created by Costa and McCree in 1992. In this research, the 60-question short form was used that evaluates the five main factors of neuroticism, extroversion, openness, agreeableness, and conscientiousness. The answer to each item is scored using a 5-point Likert scale from one to five (1 for "completely disagree" and five for "completely agree"). The scores of the scales are obtained by adding up the scores of the constituent items of that scale and averaging them. Its reliability was calculated with a test-retest method by Costa and McCree on 208 students three months apart for five factors to be 0.83, 0.75, 0.80, 0.79, and 0.79, respectively. In Iran, also, Grossi [33] has confirmed the five-factor structure of this questionnaire in general and has reported its internal consistency coefficients by Cronbach's alpha method for the main factors as 0.86, 0.73, 0.56, 0.68, and 0.87, respectively.

Rogers' Self-Concept Questionnaire (SCQ): This questionnaire was created by Rogers (1957) to measure self-concept in two forms A and B. Form "A" measures basic self-concept, i.e., it measures the individual as he/she sees himself/herself and his/her current perception of himself/herself. Form "B" measures the ideal self-concept, i.e., as the person wishes to be. Twenty-five polar adjectives (positive and negative) are placed in each form. The subject must first answer form "A" and then form "B". He/she completes form "A" according to a picture of his/her characteristics and traits, and form "B" must be completed based on his/her wishes and ideals. The way of completing the questions is that in front of each adjective, its opposite is also written; the subject should evaluate himself/herself according to those two adjectives and give himself/herself a score between 1 and 7. The subjects' raw scores from 0 to 7 are average, lower than 7 indicate positive self-concept, and more than 7 indicate weak self-concept. The results of Campbell et al. [34] research showed that the internal consistency of this scale was 0.86, and the reliability of this scale was 0.79. Its reliability coefficient has been reported according to Cronbach's alpha as 0.80 in Mousavi's study and 0.81 in Aghajani et al.'s study [35].

The Process of Research Implementation: After collecting the background and translating related texts according to the health conditions of the country (quarantine due to COVID-19), electronic versions of the questionnaires were prepared along with the text explaining the purpose of the research and points related to completing the questionnaires and justifying the participants. The questionnaire link was then sent to different individuals and requested to complete and refer the questionnaire to other people. SPSS 22 software was used to analyze the data.

Results

The research showed that the number of participants was 385, of which 48% were men (n=185) and 52% were women (n=200). Most participants were from the age group of 17 to 30 years (nearly 70%), 80% of the participants had bachelor's and master's degrees, and 57% were single. Table 1 shows the descriptive statistics of the main variables.

Before doing the regression, its defaults were checked. Due to the location of skewness and kurtosis, the assumption of normality was not rejected for any of the variables (Table 2). The value of the variance inflation factor for predicting cyberchondria based on personality traits and self-concept was in the range of 1.13 to 1.56, and its Durbin-Watson value was between 1.81 and 1.94. If the variance inflation factor value is less than 10, the assumption of multiple collinearities is rejected, and if the Durbin-Watson value is between 1.5 and 2.5, the assumption of correlation of the residuals is rejected, so using a regression for analyses is allowed. Next, in order to determine the best predictor of cyberchondria among the predictor variables of personality and self-concept dimensions, a stepwise regression model was used. Table 3 shows stepwise regression.

As shown in Table 3, Pearson's correlation coefficient of personality dimensions and self-concept with cyberchondria, it was observed that self-concept had a significant direct correlation with cyberchondria ($P<0.05$). Other than openness, personality dimensions have a significant association with cyberchondria. The highest correlation coefficient is between neuroticism and cyberchondria, which is significant ($p<0.05$).

In the stepwise regression of the personality dimensions, the neuroticism dimension was first entered into the equation, and according to the results of Table 3, 48% of cyberchondria changes are explained by the neuroticism dimension. According to the beta value, neuroticism has a significant effect on cyberchondria, and in this way, cyberchondria can be predicted ($p<0.05$, $\beta=0.59$). In the second step, self-concept was entered into the equation, and the rate of explanation along with neuroticism reached 53%. The beta level of self-concept shows its relatively high impact on cyberchondria, which means that self-concept is also a significant predictor for predicting cyberchondria according to the t value ($p<0.05$, $\beta=-0.30$). Other personality dimensions did not enter into the equation because they failed to increase the predicted value significantly.

Discussion

Regarding the role of personality traits and cyberchondria, the results showed that neuroticism, one of the personality traits, had a direct and significant effect on cyberchondria. This result is consistent with Bajcar and Bibak [1], Barek et al. [12] and McMullan et al. [36], studies. Another finding shows the direct roles and effects of neuroticism, extroversion, and conscientiousness on self-concept, which is in line with the results of Martin et al. [25] and Rahmatzadeh

Table 1: Descriptive statistics of research variables.

Variable		Average	Standard deviation	Lowest score	Lowest score	Highest score
	Neuroticism	36	17777	12	12	60
	Extraversion	40	16316	12	12	60
	Openness	38	32356	12	12	60
Personality trait	Agreeableness	38	41518	12	12	60
	Conscientiousness	40	41518	12	12	60
	self-concept	272	61/73	55	55	289
	Cyberchondria	88/95	28/03	33	33	165

and Rezakhani's [26] studies. In explaining these results, it can be said that health is a state that depends on an individual's physical and mental functions. Therefore, the personality of each individual can be considered the most important factor affecting adaptation and mental health [37]. In the five-factor personality theory, the neuroticism dimension has been an important factor in predicting an individual's psychological performance, which includes emotional reactions and can cause experiencing many negative events and stressful events in life [38]. The components of neuroticism in the five-factor model of personality include anxiety, aggression, depression, self-concern, impulsivity, and vulnerability; therefore, high scores in neuroticism make individuals prone to anxiety, which according to the COVID-19 pandemic, in this research, anxiety was more in the field of health. According to McCree and Costa and Bolger, the frequency of ineffective coping methods, such as wishful thinking and self-blame, are more common in neurotic individuals. Neurotic individuals often suffer from negative emotions such as fear, anger, sadness, and guilt, which lead to the emergence of irrational beliefs in order to control impulses and perform poorly in facing crises, have little psychological adjustment, and by performing obsessive repetitive behaviors such as repeated searches for information in the field of health, often try to get rid of negative emotions.

Self-concept also has a significant effect on cyberchondria. Although there was no direct research on the relationship between self-concept and cyberchondria, in explaining the results, it can be said that cyberchondria is usually the result of individuals' anxiety in the field of health, which is rooted in the misinterpretation of physical symptoms and self-related information. If we consider self-image and self-concept a reflection of our own judgment about capability, it can be assumed that negative or low self-concept will lead to a high information search in the field of health [39,40]. Some studies show that low self-esteem and self-worth are related to cyberchondria; self-concept as a construct aligned with self-esteem has also had such an effect. Self-concept is closely related to an individual's values, abilities, and talents [41]. If a person has negative and ineffective ideas about himself/herself, it will make him/her prone to experience many

unpleasant events. Creating negative emotions and a negative attitude toward oneself can lead to the spread of inefficient and ineffective behaviors [42]. Self-concept is a factor that affects the components of mental health and the mental health of a person in general. This relationship can also be used in reverse, meaning that negative self-concept plays an important role in mental disorders or personality disorders [43]. The results of Zhou study showed a significant relationship between self-concept and general health in such a way that negative self-concept is associated with low general health, and positive self-concept is associated with high general health.

According to the roles of self-concept and personality factors in cyberchondria, it seems that intrapersonal factors such as self-concept play an underlying role in mental disorders. From the results of the present study, we can point out the roles of self-concept and neuroticism in the diagnosis and design of an appropriate treatment method for this disorder. Positive self-concept and feeling of self-worth are directly related to initiation, creativity, and mental health, and having a negative self-concept is inversely related to an individual's mental health [44]. One of the practical suggestions of this research is to pay attention to the roles of self-concept and the neuroticism dimension as the basic dimension in the design of therapeutic and even preventive programs. The research's statistical population, design, and measurement tools create limitations in the generalization of the results, and the use of mixed research methods such as interviews and local questionnaires and even conducting longitudinal research can overcome this weakness in future research. The use of larger and more reliable samples and other research tools such as interviews is also suggested.

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Table 2: Correlation matrix between research variables.

Variable	1	2	3	4	5	6	7
Self-concept	1						
Neuroticism	-/25**	1					
Extraversion	./12	-./87**	1				
Openness	./11	-/85**	./74**	1			
Agreeableness	./15	-./55**	./55**	./63**	1		
Conscientiousness	./10	./49**	-./43**	-./52**	./51**	1	
Cyberchondria	./69**	./51**	./21**	./12	./25*	./20*	1

Table 3: Table of multiple regression coefficients for predicting cyberchondria based on personality traits and self-concept.

Model	R2	Not standardized coefficients		Standardized coefficients	T	The significance level
		B	standard deviation			
Constant		12/95	4/76	----	2/72	0/007
Neuroticism	./48	1/75	0/243	./594	7/21	0/05
Self-concept	53/.	-/136	./022	-./30	-6/15	./05

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