The Predictive Role of Fear of COVID-19 and Lockdown Fatigue in Coronavirus Anxiety among Patients with Congenital Heart Disease

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ABSTRACT

Background: The prevalence of coronavirus and its health-related psychological consequences such as fear and anxiety has been one of the most important health concerns in the 21st century.

Objectives: This study aimed to investigate the predictive role of fear of COVID-19 and lockdown fatigue in coronavirus anxiety among patients with Congenital Heart Disease (CHD).

Methods: This descriptive-correlational study was conducted through path analysis. The statistical population included the patients with CHD referred to Shahid Rajaei Hospital and Tehran Heart Center, 105 of whom were selected using convenience sampling. The data were collected using the Coronavirus Anxiety Scale (CAS), Fear of COVID-19 Scale (FCV-19S), and Lockdown Fatigue Scale (LFS). The reliability and validity of these scales were approved in the previous studies. After all, the data were entered into the SPSS 21 software and were analyzed using Pearson's correlation test and step-wise regression analysis.

Results: The study was conducted on 105 participants (6% males and 94% females) aged 20 to above 41 years. Considering marital status, 5% of the participants were single, 94% were married, and 1% were divorced. In addition, the participants' education levels ranged from diploma and lower degrees to postgraduate and higher degrees. According to the findings, coronavirus anxiety was positively correlated to the fear of COVID-19 (r = 0.509, P = 0.000) and lockdown fatigue (r = 0.466, P = 0.000) in patients with CHD. The results of step-wise regression analysis showed that based on the calculated coefficient of determination, 31% of the variability of coronavirus anxiety could be explained by the fear of COVID-19 and lockdown fatigue.

Conclusions: The study findings indicated that the fear of COVID-19 and lockdown fatigue could predict coronavirus anxiety. Therefore, interventions are recommended to be designed based on the introduction of programs concerning coronavirus anxiety, which may help reduce the anxiety and fear experienced by these patients. They can also be used as prevention programs to help prevent the onset of coronavirus anxiety in patients with CHD.

1. Background

One of the diseases of the present age that has led to a crisis in the world in form of a pandemic is a type of coronavirus (2019-nCoV) known as COVID-19 (1). Some common symptoms of this infectious disease include fever, cough, muscle soreness, and fatigue, with Acute Respiratory Distress Syndrome (ARDS) and death rates of approximately 14.8% and 4.3%, respectively (2). Evidence has indicated that the coronavirus mortality rates are significantly higher in individuals with cardiovascular comorbidities in comparison to those without these diseases. Among the sensitive groups of patients with cardiovascular diseases, those with Congenital Heart Disease (CHD) may be known as a high-risk population during this pandemic (3).

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The COVID-19 pandemic alongside its consequences have led to a noticeable increase in anxiety and fear worldwide. This fear is linked to the morbidity, fatality, and transmission rates of the disease (4). Since patients with cardiovascular comorbidities, specifically those with CHD, are known as a high-risk population during the COVID-19 pandemic (3), considering the worldwide increase in the fear and anxiety associated with the outbreak of this disease (4), it is necessary to pay attention to these patients' mental health and well-being. Although research works have suggested that the COVID-19 pandemic has significantly increased anxiety, insomnia, and depression in the general population (5), limited information is available regarding the psychological symptomatology of COVID-19 disease in patients with CHD.

Previous studies have reported that the symptoms of psychological distress such as health anxiety and cyberchondria may lead to coronavirus anxiety (6). Coronavirus anxiety has been defined as dysfunctional anxiety symptoms that are relevant to being concerned about the coronavirus (7). Prior studies have reported the presence of a number of psychological disorders including coronavirus anxiety, depression, and sleep quality problems among COVID-19 patients (8). Today, due to the COVID-19 outbreak, various studies have investigated the determinants of coronavirus anxiety, with an emphasis on different theoretical concepts and frameworks. Fear of COVID-19 is among the variables that can potentially be associated with coronavirus anxiety. In most societies, the important aspects of daily lives of people diagnosed with COVID-19 have become chaotic. These adverse effects may range from income and economic problems and feelings of helplessness, despair, and lack of security and sociability to fear of infection in public places, contact with contaminated surfaces, and very close contact with another human being. Moreover, concerns about financial bankruptcy has led to the avoidance of daily activities and social isolation, eliminating opportunities for human relations and social support. These have been potentially caused by the fear of COVID-19 (9).

There is a growing trend in experimental research on the relationship between fear of COVID-19 and anxiety and their adverse psychological consequences. The results of such studies have shown that fear of COVID-19 and subsequent infections could predict and explain the symptoms of psychological distress such as depression, generalized anxiety, and death anxiety during the COVID-19 pandemic (10). Moreover, previous studies demonstrated that patients with various cardiovascular diseases were more prone to COVID-19-related fear and anxiety and might need more psychological support during the pandemic (11). According to the above-mentioned studies, the COVID-19 outbreak and its resultant fear could lead to the symptoms of psychological distress including coronavirus-related anxiety, specifically in people with cardiovascular comorbidities (11). Therefore, it is necessary to investigate the levels of COVID-19-related fear and anxiety among this population in an attempt to design helpful interventions to reduce high levels of psychological distress and enhance their mental health.

Another variable associated with coronavirus anxiety is the concept of lockdown fatigue. With the emergence of COVID-19, there has been a growing trend in the studies on quarantine and its subsequent health-related consequences. The coronavirus outbreak has made people in many countries stay at home or in quarantine centers. The concept of lockdown fatigue has recently entered the COVID-19 pandemic literature and refers to the exhaustion experienced due to isolation that has been deemed suitable to avoid the spread of the virus (12). Although quarantine can act as an appropriate strategy to prevent the spread of COVID-19, it may result in lockdown fatigue that can, in turn, lead to many adverse symptoms such as lower interest in previous enjoyable activities and increased anxiety and fear associated with the COVID-19 pandemic (13).

Prior studies on the psychological consequences of quarantine have reported multiple symptoms of psychological distress such as higher levels of insomnia, loneliness, depression, Post Traumatic Stress Disorder (PTSD), and anxiety in individuals with lockdown fatigue (14, 15). Some stressors for the adverse psychological symptoms linked with being quarantined include fear of infection, boredom, insufficient supplies and information, stigma, frustration, and loss of finances (16). In the study performed by Dubey et al. (2020), some long-term consequences of quarantine were an increase in experiencing anxiety, fear of infection transmission, dependence on substances, and feeling of incompatibility (17).

The COVID-19 pandemic has posed serious threats to the physical health of individuals, which can lead to widespread psychological problems such as coronavirus-related fear and anxiety as well as lockdown fatigue. Since patients with cardiovascular diseases such as CHD are among the high-risk populations in this pandemic, it is necessary to pay attention to the psychological well-being of these patients in order to improve their medical and mental health. Although various studies have investigated coronavirus anxiety and its relationship with numerous psychological consequences, the psychological variables that can play a predictive role in coronavirus anxiety in patients with CHD are still unknown. Considering the high prevalence of COVID-19 disease and the importance of paying attention to the physical and mental health of patients with CHD, knowing the predictors of coronavirus anxiety can help mental health professionals implement targeted guidelines and interventions to reduce coronavirus anxiety, thereby increasing these patients' adaptation.

2. Objectives

the present study aims to investigate the predictive role of fear of COVID-19 and lockdown fatigue in coronavirus anxiety amongst patients with CHD.

3. Methods

This descriptive-correlational study aimed to investigate the effects of fear of COVID-19 and lockdown fatigue on coronavirus anxiety among patients with CHD. The study population included all patients with CHD referred to Shahid Rajaei Hospital and Tehran Heart Center. The Sample Power software was used to estimate the sample size. Considering

the power of 90%, 105 patients with CHD were selected via convenience sampling. The inclusion criteria of the study were 1. suffering from congenital anatomical heart disease confirmed by echocardiography, heart tests, or surgery, 2. having the ability to read and understand the questionnaire content and complete the consent form, and 3. aging over 18 years. The exclusion criteria were 1. poor physical/mental conditions limiting participation in the study, 2. fatigue, limiting participation in the study, and 3. unwillingness to take part in the research.

The following three questionnaires were used to evaluate the research hypotheses: Coronavirus Anxiety Scale (CAS), Fear of COVID-19 Scale (FCV-19S), and Lockdown Fatigue Scale (LFS).

3.1. Measures

3.1.1. The Coronavirus Anxiety Scale

This scale was designed by Lee et al. (2020) to identify the possible cases of dysfunctional anxiety associated with the COVID-19 crisis. It was used to measure the physiological symptoms evoked by COVID-19. The respondents were required to answer the five items based on a five-point Likert scale ranging from never (0) to almost every day during the past two weeks (4). A high score on a particular item or a high overall score (< 9%) indicated problems for the participants that might, in turn, warrant further evaluations or treatments. Confirmatory factor analysis showed that CAS measured a reliable one-dimensional construct (α = 0.93), which was fixed in terms of gender, race, and age. It also had an acceptable construct validity and was reported as a valid and efficient scale (10). In addition, Abasi et al. (18) reported the appropriate validity and reliability of the Persian version of CAS (internal consistency of 0.80, test-retest reliability of 0.95) (18).

3.1.2. The Fear of COVID-19 Scale

FCV-19S, as a self-assessment scale, was developed by Ahorsu et al. (2020) to evaluate the symptoms of fear of COVID-19. This scale consisted of seven items scored based on a five-point Likert scale ranging from one (strongly disagree) to five (strongly agree). The total score of the scale was determined by calculating the number of answers and could, thus, range from 7 to 35. Higher scores indicated a greater fear of the coronavirus. Ahorsu et al. (2020) designed this scale in a sample of 717 Iranian participants (4). The items were developed based on an extensive review of the existing fear scales through expert assessments and interviews with the participants. The results showed that Pearson's correlation coefficient ranged from 0.47 to 0.56. Additionally, the internal consistency and test-retest reliability of FCV-19S were α = 0.82 and r = 0.72, respectively. Moreover, the concurrent validity of this scale was respectively 0.42 and 0.11 with the Hospital Anxiety and Depression Scale (HADS) and 0.48 and 0.46 with the Perceived Vulnerability to Disease Questionnaire (PVDQ) (4). Furthermore, Dadfar et al. (19) reported the appropriate validity and reliability of the Persian version of FCV-19S (internal consistency = 0.87 and a significant positive correlation between FCV-19S and CAS) (19).

3.1.3. The Lockdown Fatigue Scale

This scale was designed by Labrague and Ballad (2020) to assess the symptoms of fatigue during lockdown, which was deemed suitable to control the spread of COVID-19. This scale contained ten items scored based on a five-point Likert scale ranging from never (1) to always (5). Thus, the highest score of the scale was 50. Besides, scores 1 - 12, 13 - 25, 26 - 37, and 38-50 were classified as low, mild, moderate, and severe lockdown fatigue, respectively. The internal validity, content validity, and test-retest reliability of this scale were 0.84, 0.93, and r = 0.91, respectively (12). Shirzad et al. (20) also assessed the reliability and validity of LFS. The results showed that the internal consistency of LFS was 0.89 (20). Moreover, there was a significant positive relationship between LFS and CAS, FCV-19S, and PHQ-9 (20).

3.2. Procedure

The present study was approved by the Research Ethics Committee of Shahid Beheshti University of Medical Sciences (approval code: IR.SBMU.RETECH. REC.1399.1042). Data collection was carried out on a one-on-one basis. After receiving the participants' informed consent forms within a specified time period, they were provided with the required information in form of a questionnaire. They were also explained about the method of questionnaire completion as well as the ethical considerations. The completed questionnaires were collected after a period of time agreed by the patients. All through the research, attempts were made to observe all ethical considerations including voluntary participation. The participants were also assured that their personal information would remain confidential. Moreover, no actions that would endanger the health of the participants or other people were taken during the study period.

3.3. Statistical Analysis

Statistical analyses were performed on 105 complete questionnaires. In order to analyze the data and test the research hypotheses, descriptive (mean and Standard Deviation (SD)) and inferential (Pearson's correlation and step-wise regression) statistics were employed using the SPSS 21 software.

4. Results

This study was conducted on 105 participants. The frequency distribution of male and female participants was 6 (approximately 6%) and 99 (approximately 94%), respectively. Among the patients, five were single (5%), 99 were married (94%), and one was divorced (1%). Additionally, 20 (19%), 35 (33%), 32 (31%), 16 (15%), and 2 (2%) participants aged 25, 26 - 30, 31 - 35, 36 - 40, and above 41 years, respectively. Considering education level, 55 participants (52%) had diplomas and lower degrees, 41 (39%) had undergraduate degrees, and 9 (9%) had postgraduate and higher degrees. Moreover, approximately 44% of the study population had a family history of heart diseases.

The descriptive results of the research variables have been presented in Table 1. Regarding CAS, 97.1% of

Table 1. Descriptive Statistics of the Research Variables

Variable	Mean	Descriptive indices			Skewness		Kurtosis	
		Minimum	Maximum	Standard deviation	Z Statistics	SE	Z Statistics	SE
Coronavirus anxiety	1.56	0	15	2.57	1.980	0.236	1.618	0.467
Fear of COVID-19	20.01	7	34	5.99	-0.336	0.236	0.037	0.467
Lockdown fatigue	27.39	11	50	10.69	0.234	0.236	-1.262	0.467

Table 2. The Results of Pearson's Correlation Test

Variable	Fear of COVID-19	Lockdown Fatigue	Coronavirus Anxiety
Fear of COVID-19	1		
Lockdown fatigue	0.520**	1	
Coronavirus anxiety	0.509**	0.466**	1

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

Table 3. The Results of Step-Wise Regression Analysis to Predict Coronavirus Anxiety Based on the Predictor Variables

Step	Predictor Variables (Constant)	B	β	R	R²	T-Statistic	Sig.	F-Statistic	Sig.
1	Fear of COVID-19	-3.113	-			3.826	0.000**		
	(constant)	0.234	0.509	0.509	0.259	5.996	0.000**	35.949	0.000**
2	Fear of COVID-19	-3.740	-			4.586	0.000**		
	Lockdown fatigue	0.168	0.365	0.561	0.314	3.805	0.000**	23.375	0.000**
	(constant)	0.071	0.276			2.875	0.000**		

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

the participants (n = 102) had no dysfunctional anxiety associated with the COVID-19 pandemic, while 2.9% (n = 3) suffered from dysfunctional anxiety (scores 9 and above on the CAS), meaning that they had significant clinical impairments due to coronavirus anxiety. Besides, the results of the FCV-19S indicated moderate to high fear of the coronavirus. Finally, with regard to lockdown fatigue, high or severe, moderate, mild, and low fatigue levels were found in 24.8% (n = 26), 26.7% (n = 28), 43.8% (n = 46), and 4.8% (n = 5) of the participants, respectively.

Pearson's correlation test was used to investigate the relationships among FCV-19S, LFS, and CAS. This test required assumptions that were investigated before the inferential analyses. One of these assumptions was the normal distribution of the research variables. To that aim, skewness and kurtosis indices were used. These values ranged from 1.96 to -1.96, which indicated that the research variables were normally distributed (Table 1). The second assumption was the linear relationship between the criterion variable and a predictor variable when all the other predictor variables were kept constant. The F-test utilized to measure the linearity of the relationship between the predictor and criterion variables was less than the pre-determined significance level ($\alpha = 0.05$), which confirmed the linearity of the relationship between the studied variables. The last assumption of regression analysis was the lack of a high correlation between the predictor variables (multicollinearity), which was evaluated using Tolerance (TOL) and Variance Inflation Factor (VIF). The results showed no multicollinearity between the independent variables. Since the TOL rate was close to one and the VIF rate was less than two, these tests could be used to assess the research hypotheses after observing the assumptions of the correlation test and regression analysis.

The results of Pearson's correlation test (Table 2) revealed a significant positive relationship between coronavirus anxiety and fear of COVID-19 (r = 0.509, P = 0.000) and lockdown fatigue (r = 0.466, P = 0.000).

A stepwise regression analysis was used to determine the role of fear of COVID-19 and lockdown fatigue in predicting coronavirus anxiety (Table 3). The step-wise regression is useful, since the strongest predictor is added in every step to determine the extent of changes in the results. To assess the assumption of multicollinearity between the independent variables, TOL and VIF indices were used. The results indicated that TOL and VIF were equal to 0.7 and 1.37, respectively, indicating the absence of a linear relationship. According to the results of the step-wise regression analysis, in the first step, the first variable that entered and remained in the analysis was fear of COVID-19. This implied that this variable had a greater effect than lockdown fatigue. In the stepwise regression analysis, the last step is usually the basis of the analysis. In this step, lockdown fatigue was entered into the analysis. Based on the results, the correlation and determination coefficients were equal to 0.561 and 0.314, respectively. In addition, the resulting F-value showed that the regression model was significant at the 99% level. According to the calculated coefficient of determination, 31% of the variability of coronavirus anxiety, as a criterion variable, could be explained by the two predictor variables (fear of COVID-19 and lockdown fatigue).

5. Discussion

This study aimed to investigate the role of fear of COVID-19 and lockdown fatigue in predicting coronavirus anxiety among the patients with CHD. The findings indicated that coronavirus anxiety was positively correlated to the fear of COVID-19 and lockdown fatigue. This suggested that fear of COVID-19 followed by lockdown fatigue had the highest explanatory power in predicting coronavirus anxiety among

the patients with CHD. Up to now, no studies have directly measured the predictive role of COVID-19-related fear and lockdown fatigue in coronavirus anxiety amongst patients with CHD. Nevertheless, the results of the present study were consistent with those of some similar studies (4, 5, 10, 11, 14, 16). The previous studies have highlighted the increase of disease-related fear and anxiety during virus outbreaks and epidemics (4). Since the media, social networking sites, and patients' living environments were focused on disease-related news and health recommendations during the pandemic and fear of COVID-19 was previously reported to be linked with morbidity, fatality, and transmission rates of the disease (4), being involved with such information could lead to increased health worries, anxiety, and fear of being infected, thereby increasing the level of coronavirus anxiety experienced by these patients. These results were in agreement with those of the previous studies, showing that the fear of coronavirus was linked to coronavirus anxiety (11). Therefore, it could be stated that paying constant attention to the harmful aspects of the disease might activate the sympathetic nervous system and lead to anxiety in patients (21). On the other hand, the COVID-19 pandemic and the lack of a definitive treatment for the disease led individuals to experience high levels of specific emotions such as dysfunctional fear and distress. Therefore, individuals with hardships in using appropriate coping strategies in the face of these emotions might feel infected with the virus in case of any small symptoms and might, therefore, experience high levels of COVID-19-related stress and anxiety. This, in turn, could result in dysfunctional psychological states such as coronavirus anxiety (22). It could also be inferred that fear of getting infected, fear of death, and disease-related problems such as economic and occupational problems might lead to emotional turmoil associated with the disease and cause the spread of uncontrollable worries, inability to stay calm, being too irritable, and anticipation of unpleasant events in future, which could ultimately increase patients' disease-related anxiety (8). Furthermore, when people experienced such symptoms as stress and fear during the COVID-19 pandemic, they might follow coronavirus-related news more frequently, which could ultimately lead to higher levels of anxiety. Thus, it could be concluded that fear of COVID-19 could predict coronavirus anxiety.

Regarding the role of lockdown fatigue in predicting the coronavirus anxiety, it could be mentioned that although lockdown was considered a necessary preventive measure during the outbreak of an infectious disease such as the coronavirus, it might carry many negative psychological effects influencing people's daily functioning for a long time (14). During a quarantine, individuals' routine lives are disrupted and, as a result, they will not be able to predict and plan for their future. These individuals may feel that they are weak in having control over the flow of their life, which can result in the feelings of insecurity, frustration, anxiety, and depression (16). Overall, coronavirus-related lockdown may change people's social and personal lives as well as their values and social goals. Therefore, home quarantine can lead to increased fear and anxiety in these individuals (23).

5.1. Limitations and Recommendations

One of the limitations of the present study was that it was performed only on the patients admitted to Shahid Rajaei Hospital and Tehran Heart Center. Therefore, caution should be exercised when generalizing the results to patients under home hospitalization or those suffering from other diseases. In addition, due to the cross-sectional nature of this study and the fact that the researchers had no control over the recent events in the patients' lives, future longitudinal studies with larger sample sizes are recommended to be conducted on the issue. Besides, since convenience sampling method was used in the present research, the results should be generalized with due caution. Random sampling is also suggested to be used in other studies to further generalize the findings. Moreover, the study data were collected using a questionnaire. Hence, other measurement methods such as semi-structured interviews, continuous observations, and other qualitative methods are recommended to be used in future investigations.

Based on the study results, it is necessary to introduce coronavirus anxiety interventions and guidelines in order to reduce the fear and anxiety of being infected with this disease among patients with CHD. These patients should also be informed about the use of adaptive coping strategies during this period, which can be considered a prevention program to help people overcome coronavirus anxiety. Finally, future studies are recommended to evaluate the physical, social, and spiritual care of patients with CHD at specific stages of the disease, especially at COVID-19 diagnosis, to help develop further knowledge on the issue.

5.2. Conclusion

The COVID-19 disease has caused irreversible consequences for the society and the health system, especially for high-risk patients such as those with heart diseases. The present study explored the effects of the fear of COVID-19 and lockdown fatigue on coronavirus anxiety among the patients with CHD. The results revealed that COVID-19-related fear and lockdown fatigue could predict coronavirus anxiety among these patients. These findings provided guidance for further research on interventions for preventing coronavirus anxiety in order to reduce the anxiety and fear associated with the disease and to help patients overcome the dysfunctional anxiety associated with the coronavirus.

5.3. Ethical Approval

This research was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences (code: IR.SBMU.RETECH.REC.1399.1042, https://ethics.research.ac.ir/IR.SBMU.RETECH.REC.1399.1042).

5.4. Informed Consent

The informed consent form for this study was uploaded in the supplementary files during the process of submission (file name: Informed Consent Form.pdf, size: 90 KB).

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