



The Open Public Health Journal

Content list available at: <https://openpublichealthjournal.com>



RESEARCH ARTICLE

Emotional Changes in Hospitalized Patients in the COVID-19 Ward: Elizabeth Kubler-Ross Theory as an Analytical Framework

Masoume Sinaei¹, Maryam Saberi², Seyed Saeed Tabatabaee³, Marjan Moradi⁴, Farzaneh Bavandi⁵ and Rasoul Raesi^{1,6,*}



¹Department of Nursing, Torbat Jam Faculty of Medical Sciences, Torbat Jam, Iran

²Department of Nursing, Faculty of Nursing, Torbat Jam Faculty of Medical Sciences, Torbat Jam, Iran

³Social Determinants of Health Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

⁴Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

⁵Student Research Committee, Torbat Jam Faculty of Medical Sciences, Torbat Jam, Iran

⁶Department of Health Services Management, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract:

Aim:

This study was conducted to determine emotional changes in hospitalized patients in the COVID-19 ward based on the Kubler-Ross theory.

Background:

Humans exhibit different behaviors in response to crises. COVID-19, as a health crisis, was accompanied by widespread changes in the behavior of patients.

Methods:

This descriptive-analytical study was conducted in 2021 using a census method on 139 hospitalized patients in the COVID-19 ward of the 22 Bahman Hospital in Khorramshahr, Iran. Data were collected using a researcher-made questionnaire to determine the stages of change in hospitalized COVID-19 patients. The data were analyzed using SPSS 22 software and one-sample t-test, independent t-test, one-way ANOVA, Tukey's post hoc test, and Pearson correlation coefficient at a significant level of 0.05.

Results:

The minimum age was 27 and the maximum age was 67 years. The levels of denial were moderate, while anger and bargaining were lower than average, and depression and acceptance were higher than average. The average denial, anger, and depression scores in male patients were significantly higher than those in female patients ($p < 0.001$). There was a significant negative correlation between denial and anger scores and age ($p < 0.001$) and a significant positive correlation between acceptance and age ($p = 0.03$).

Conclusion:

Since contracting COVID-19 and hospitalization in COVID-19 wards are associated with various behavioral changes, screening patients for behavioral changes is recommended to health policymakers and managers. Understanding these changes can help accurately diagnose and effectively treat these patients.

Keywords: Elizabeth kubler-ross, COVID-19, Emotion, Personality, Patient, COVID-19 ward.

Article History

Received: July 27, 2023

Revised: October 08, 2023

Accepted: October 19, 2023

1. INTRODUCTION

The emergence of the coronavirus (COVID-19) in late 2019 in China and its widespread prevalence in other countries represent a real crisis, of which history has recorded few examples of such dimensions [1]. The uncertainty of the

pandemic's progress puts even more psychological pressure on people. The probable reason for these mental problems may be related to the fear of contracting the disease and the fear of loss of control and death [2].

The widespread spread of COVID-19 quickly led to a global crisis, such that the lives and relationships of humans worldwide faced a particular challenge. Humans display

* Address correspondence to this author at the 6- Department of Health Services Management, Mashhad University of Medical Sciences, Mashhad, Iran;
E-mail: Raesi.br881@gmail.com

different behaviors when faced with diseases. One of the most accepted theories regarding human behavior in the face of diseases and crises is Elizabeth Kubler-Ross's theory. She was an American-Swiss psychiatrist and one of the pioneers and prominent advocates of palliative care and research related to individuals' experiences and emotions during crises, diseases, and death [3, 4].

Kubler-Ross believes that humans display five stages of denial, anger, bargaining, depression, and acceptance when faced with a disease for themselves or their loved ones. Therefore, it can be concluded that patients will exhibit these behaviors when faced with COVID-19. These stages include:

1- Denial of contracting COVID-19: The first stage of the disease is denial. In this stage, the individual becomes shocked and stunned upon hearing the news of being infected with COVID-19. Then, they try to ignore this reality and erase the anxiety-inducing situation. In this stage, the person nurtures thoughts like: "It must be a mistake; it's a lie! Are they joking? Me? No, it's not possible!" Many patients resort to

denial when they see themselves in the COVID-19 ward and face hospital staff. In this stage, the person tries to preserve their psychological condition by denying the disease [5, 6].

2- Anger at accepting the contraction of COVID-19: At the end of the first stage, when the denial wall collapses, denial gives way to anger, resentment, envy, and hatred, and the patient becomes angry with their surroundings without any order or rule. In these circumstances, everything causes dissatisfaction for the patient. In this stage, the patient does not accept the healthcare services from doctors, nurses, *etc.*, and tries to express this dissatisfaction with their anger. Kubler-Ross believes that the trouble begins when we cannot put ourselves in the patient's place and understand their emotions [3, 4].

3- Bargaining Upon Recovery from COVID-19: The third stage of accepting the disease is bargaining. Kubler-Ross believes that this stage often takes place between the patient and God, and it is difficult. If we have not succeeded in digesting the sad realities in the first stage and have become angry with God and others in the second stage, then we tell ourselves that perhaps we can reach some sort of agreement, and maybe this inevitable event could be delayed. If God intends to take me from this world and does not pay attention to my wrathful pleas, then I will go with good language, but in the correct order. The patient keeps most of the promises and vows made to God like hidden secrets, but sometimes indirectly alludes to them in private conversations or confessions. Many patients vow to dedicate their lives to God in return for regaining their health and having a longer life [4, 7].

4- Depression from Contracting COVID-19: Eventually, a time comes when the patient needs to undergo various tests, use devices and equipment to facilitate their breathing, and prolong their hospital stay, and gradually, signs of disease progression appear within them. In this stage, the patient is no longer able to deny their illness, and their feelings of anger and resentment give way to a sense of decay and, consequently, depression. However, Kubler-Ross distinguishes between two

types of depression and believes that to help the patient get out of these conditions, a distinction must be made between these two types of depression. The first type of depression is reactive depression [7]. This type of depression is a result of losing something in the past, such as losing abilities, a job, amputation, and family disruptions. On the other hand, the second type of depression is preparatory or anticipatory depression, in which the patient prepares to accept the disease. Unlike reactive depression, this type of depression is a result of dealing with upcoming affairs. At this time, the patient prepares themselves for losing everything. In fact, the patient tries to facilitate the acceptance of the illness. In this type of depression, focusing on the positive aspects of life and encouraging the patient to fight the disease can help their condition [4].

5- Acceptance of Contracting COVID-19: According to Kubler-Ross's theory, acceptance is the final stage of the process of coping with the disease and crisis, and the patient will reach this stage only when they have been able to pass through the previous stages with the help of others. In this stage, the patient is neither depressed nor angry. However, it should not be assumed that this stage is a happy stage, as patients in this stage fall into two groups; the first group are patients whose hope lies in the medical staff, and by accepting their contraction to COVID-19, they try to make efforts for their own recovery to get out of this crisis and disease as soon as possible. The second group are patients recognized based on Kubler-Ross's theory. They are in this stage as if devoid of any feelings as if the pain and suffering of the disease have come to an end, and they are taking their final rest before a long journey. They start to say, "I am done," and begin to detach themselves from their interests in this world [3, 4, 8].

Kubler-Ross introduces these five stages as human defense mechanisms in coping with difficult situations and distressing news and states that although these stages have been mentioned separately, they often overlap; furthermore, all these stages have a common element called hope. She says: "The most realistic and accepting patients have also opened a window for hope. The possibility of a definite treatment existing, a new drug being discovered, or a research project yielding results at the last moment. With this beacon of hope, the patient can endure pain and suffering for weeks and months" [3, 4, 9].

Understanding the emotional changes experienced by hospitalized patients in the COVID-19 ward is crucial for several reasons. Firstly, it allows healthcare professionals to gain insight into the profound psychological impact of the pandemic on patients. This insight can inform tailored interventions and support strategies that help patients cope with the emotional challenges they face. Secondly, by utilizing the Elizabeth Kubler-Ross Theory as an analytical framework, researchers can explore the stages of grief and emotional adaptation that patients undergo, contributing to a deeper understanding of their experiences. This research is essential for improving patient care, mental health support, and overall well-being in the context of the COVID-19 pandemic. In this study, we will recount the stages of Elizabeth Kubler-Ross's theory in understanding the personal changes in patients with COVID-19. Hopefully, the results of this research can help

healthcare policymakers gain a comprehensive understanding of the hospitalized patients' conditions in the COVID-19 ward, enabling them to provide the necessary support based on the understanding of the emotional states and personal changes of COVID-19 patients during their hospitalization. Since no study has been conducted in this area so far, this research was designed and implemented as a type study with the aim of determining the emotional changes of patients admitted to the Corona ward based on the theory of Elizabeth Kubler Ross at 22 Bahman Khaf Hospital.

2. MATERIALS AND METHODS

2.1. Study Design and Setting

This research was conducted as a descriptive-analytical study with a six-month duration in 2021 by census method on 139 patients hospitalized in the COVID-19 ward of 22 Bahman Hospital in Khaf.

2.2. Study Participants and Sampling

In this study, after obtaining the research project's approval and ethical clearance from the Research Ethics Committee of Mashhad University of Medical Sciences, a formal introduction letter was received from Mashhad University of Medical Sciences and presented to the relevant authorities at 22 Bahman Hospital in Khaf. All patients hospitalized in the COVID-19 ward who met the inclusion criteria (consent to participate in the study, positive PCR test, full consciousness, at least a three-day history of hospitalization in the COVID-19 ward, no history of neurological or psychiatric diseases diagnosed by a specialist physician, and no use of neurologic or psychiatric medications) were selected and included in the study.

2.3. Data Collection Tool and Technique

Since no standardized questionnaire has been designed to assess the stages of emotions and personal changes in COVID-19 patients based on Elizabeth Kubler-Ross's model, data collection was performed using a researcher-made questionnaire called "Determining Stages of Change" in COVID-19 patients hospitalized in the COVID-19 ward through interviews conducted by the researcher (while adhering to standard protocols and using standard personal protective equipment). This questionnaire was designed based

on library studies and related research.

The questionnaire consists of two parts: the first part includes demographic information (gender, age, marital status, educational level, background of underlying diseases, number of days hospitalized in the COVID-19 ward, type of hospital ward), and the second part of the questionnaire includes 25 statements in 5 domains: denial (statements 1 to 5), anger (statements 6 to 10), bargaining (statements 11 to 15), depression (statements 16 to 20), and acceptance (statements 21 to 25). These statements are scored on a 5-point Likert scale from "completely agree" (score 1) to "completely disagree" (score 5). The validity of this questionnaire was assessed using the content and face validity method and obtaining the opinions of 6 faculty members and experts. For determining the reliability of the tool, the test-retest method was used. The reliability of the questionnaire was examined using Cronbach's alpha coefficient, resulting in 0.84 for the overall questionnaire, 0.63 for the denial stage, 0.62 for the anger stage, 0.61 for the bargaining stage, 0.76 for the depression stage, and 0.62 for the acceptance stage.

Data collection was done using a researcher-made questionnaire to determine the stages of change in patients admitted to the Corona ward through interviews with patients by the researcher (observance of standard protocols and use of standard personal protective equipment).

2.4. Data Analysis

Data were analyzed using SPSS version 22 statistical software and statistical tests of one-sample t, independent t, one-way analysis of variance, Tukey's post hoc, and Pearson's correlation coefficient at a significance level of $p < 0.05$.

3. RESULTS

In this study, 139 patients hospitalized in the COVID-19 ward of 22 Bahman Hospital in Khaf were examined. The minimum age was 27 years, the maximum age was 67 years, and the mean age was 38.42 ± 20.13 years. Most of the studied patients were male (66.9%), married (43.9%), and had a university education (45.3%). 76 individuals (54.7%) had a history of underlying diseases, and most of the patients (66.9%) were hospitalized in the COVID-19 ward for 1 to 3 days, and the majority of them (54.7%) were in the General COVID-19 ward (Table 1).

Table 1. Demographic characteristics of the studied patients.

Variable		Number	Percentage
Gender	Male	93	66/9
	Female	46	33/1
Marital Status	Single	48	34/5
	Married	61	43/9
	Divorced	30	21/6
Educational Level	Illiterate	60	43/2
	Non-university education	16	11/5
	University education	63	45/3
History of Underlying Diseases	None	63	45/3
	Present	76	54/7

(Table 1) contd....

Variable	Number	Percentage
Number of days hospitalized in the COVID-19 ward	1 to 3 days	93
	More than 3 days	46
Type of hospital ward	General COVID-19 ward	76
	Specialized COVID-19 ward	63

Table 2. Status of emotional stages and personal changes in the studied patients.

Variable	Mean	Standard Deviation	Skewness	Kurtosis	t-test Result	
					t-value	P-value
Denial	3/03	1/44	0/55	-1/59	0/27	0/79
Anger	2/67	1/14	0/08	-1/40	3/44	0/001
Bargaining	2/74	1/01	0/66	-0/80	3/07	0/003
Depression	3/13	0/77	0/14	-0/86	2/04	0/04
Acceptance	3/90	0/88	1/02	-0/09	12/01	<0/001

Considering that the skewness and kurtosis coefficients for the research variables are in the range of [-2, 2], the data in the study follow a normal distribution. The results of the one-sample t-test in Table 2 show that the mean score of denial in patients hospitalized in the COVID-19 ward does not significantly differ from the theoretical mean (3) (p=0.79). However, the mean scores of anger and bargaining are significantly lower than the theoretical mean (3), and the mean scores of depression and acceptance are significantly higher than the theoretical mean (3) (p<0.05). In other words, the denial state of patients hospitalized in the COVID-19 ward is at an average level, while the levels of anger and bargaining are below average, and the levels of depression and acceptance are above average.

The results showed that the mean scores of denial, anger, and depression were significantly higher in male patients compared to female patients (p<0.001). However, the mean scores of bargaining and acceptance did not differ significantly between male and female patients (p>0.05). Moreover, the mean scores of denial, anger, bargaining, and depression were significantly higher in married and single patients compared to divorced patients, and the mean score of acceptance was significantly higher in married and divorced patients compared

to single patients (p<0.001). Furthermore, the mean score of denial was significantly lower in patients with university education compared to illiterate patients, while the mean score of depression was significantly lower in illiterate patients compared to others (p<0.001). The mean score of anger was significantly higher in patients with non-university education, and the mean score of acceptance was significantly higher in patients with university education compared to others (p<0.05). Patients with no history of underlying diseases had a significantly higher mean score of depression compared to patients with a history of underlying diseases (p<0.001), but the mean scores of denial, anger, bargaining, and acceptance did not significantly differ based on the history of underlying diseases (p>0.05). Moreover, patients who were hospitalized for more than 3 days had significantly higher mean scores of denial, anger, bargaining, and depression compared to patients hospitalized for 1 to 3 days (p<0.001). Additionally, patients hospitalized in the General COVID-19 ward had significantly higher mean scores of denial, anger, bargaining, and depression compared to patients in the specialized COVID-19 ward, and the mean score of acceptance was significantly higher in patients in the specialized ward compared to those in the General ward (p<0.001) (Table 3).

Table 3. Comparison of the average score of emotional stages and personal changes in the studied patients according to demographic characteristics.

Variable	Denial	Anger	Bargaining	Depression	Acceptance
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Gender					
	Male	1±12/3/10	1±81/2/02	0±28/3/73	1±80/3/05
	Female	0±11/2/16	0±74/1/46	0±84/2/77	0±08/4/26
P-value of independent t-test	<0/001	<0/001	0/23	0/001	0/08
Marital Status					
	Single	1±44/3/55	1±10/3/09	0±83/2/90	0±25/3/68
	Married	1±19/3/49	1±85/2/09	0±90/2/99	0±44/3/71
	Divorced	0±06/2/18	0±61/1/52	1±27/2/07	0±33/2/39
P-value of ANOVA test	<0/001	<0/001	<0/001	<0/001	<0/001
Educational Level					
	Illiterate	1±43/3/47	1±69/2/18	1±61/2/08	0±46/2/38
	Non-university education	1±05/4/32	1±45/3/04	0±28/3/25	0±55/3/48
	University education	1±40/2/14	1±45/2/05	1±73/2/01	0±67/3/60
P-value of ANOVA test	<0/001	0/006	0/06	<0/001	<0/001
History of underlying diseases					
	None	1±87/2/48	1±82/2/19	1±75/3/03	0±61/3/64
	Present	1±17/3/40	1±55/2/09	0±73/2/99	0±74/2/64
P-value of independent t-test	0/22	0/16	0/93	<0/001	0/61

(Table 3) contd....

Variable		Denial	Anger	Bargaining	Depression	Acceptance
Number of days hospitalized in the COVID-19 ward	1 to 3 days	1±61/2/27	1±43/2/17	1±59/2/06	0±19/3/83	0±87/3/93
	More than 3 days	1±90/3/37	0±16/3/91	0±03/3/81	0±01/3/63	0±94/3/78
P-value of independent t-test		<0/001	<0/001	0/01	0/20	0/66
Type of hospital ward	General COVID-19 ward	1±84/3/53	0±56/3/62	0±17/3/72	0±29/3/81	1±67/3/12
	Specialized COVID-19 ward	0±06/2/18	0±59/1/51	1±22/2/06	0±95/2/69	0±17/4/26
P-value of independent t-test		<0/001	<0/001	<0/001	0/009	0/001

Table 4. Correlation between emotional stages and personal changes with the age of the studied patients.

Variable		Denial	Anger	Bargaining	Depression	Acceptance
Age	r	-0.4	-0.41	0.04	-0.13	0.18
	p	<0.001	<0.001	0.62	0.14	0.03

The results of the Pearson correlation coefficient in Table 4 showed that there was a significant negative correlation between denial and anger scores with the age of the studied patients ($p < 0.001$), and there was a significant positive correlation between acceptance scores and the age of the patients ($p = 0.03$). However, there was no significant correlation between the stages of bargaining and depression with the age of the patients ($p > 0.05$).

4. DISCUSSION

This study was conducted to determine emotional changes in hospitalized patients in the COVID-19 ward based on the Kubler-Ross theory.

The results of the current study showed that the mean denial score in hospitalized COVID-19 patients was at an average level. This finding can be interpreted as COVID-19 patients showing resistance in accepting their illness because accepting this reality is unpleasant for them. Therefore, they use coping mechanisms and express statements such as “I have been mistakenly hospitalized in the COVID-19 ward,” “The diagnosis of COVID-19 for me was not accurate enough,” and “I will never be infected with COVID-19.

This finding aligns with the study conducted by Kalichman on the behavior of AIDS patients, which showed that many of them deny their illness at the time of diagnosis and clinical symptoms [10]. Additionally, the study by Martina and colleagues demonstrated that many patients facing diseases such as cancer or infectious diseases tend to deny their illness to preserve their mental and psychological conditions [11]. However, the results of the study by Bavel *et al.* contradicted the findings of the current study, as their results indicated that COVID-19 patients easily accepted their illness and quickly sought treatment at healthcare centers [12]. This discrepancy can be attributed to different geographical and cultural conditions, different study populations, and varying clinical conditions of patients in these two studies.

The results of the current study also showed that the mean anger and bargaining scores were below the average level. At this stage, COVID-19 patients have gone through the denial phase and are engaged in behaviors that gradually lead them toward accepting their infection. During this stage, individuals experience momentary emotions and become shocked, which then turn into anger. They try to blame others and external circumstances for the specific event. Subsequently, they become more aware of their surroundings and events and attempt to defend themselves against changes. This defense

mechanism can take various forms, such as prayers and requests to God, promises to oneself, promises to the medical staff, *etc.*

This finding is consistent with the study by Doha Kim and colleagues, which revealed that people displayed behaviors like anger and anxiety at the beginning of the COVID-19 pandemic and used concepts like “Who is to blame?” “Why me?” “Why did this situation occur?” *etc.* [13].

Furthermore, the results of the current study showed that the mean depression and acceptance scores were higher than the average level. As time passes, denial, anger, and bargaining behaviors decrease in COVID-19 patients, while depression and eventually acceptance behaviors increase. Therefore, it can be expected that after passing through the initial stages of this theory, COVID-19 patients move towards the final stages and somehow accept their illness. They actively seek treatment and establish better relationships with healthcare personnel.

During this stage, patients express new concepts, such as apologizing to the healthcare staff who are working for their health or promising to make amends. They talk to the medical staff about their feelings regarding the COVID-19 disease. They attempt to draw upon their past experiences and increase their knowledge about the situation they are facing. They wish for improvement or at least a resolution of the situation. They remind themselves that the situation could have been much worse. They find positive aspects even in being infected with COVID-19. They maintain composure in the face of challenges or problems. They try to make efforts for their own treatment and cooperate with the healthcare team.

This finding aligns with the study conducted by Kumar and colleagues, which showed that hospitalized COVID-19 patients had a higher level of depression [14]. Regarding the relationship between this finding and the study by Kumar, it can be suggested that the high prevalence of depression may serve as an entry point for patients to move into the acceptance stage and accept the treatment process.

The results of the current study also demonstrated that the mean scores of denial, anger, and depression were significantly higher in male patients compared to female patients. This finding is consistent with the study by Addis and colleagues, which showed that the level of denial of illness and subsequent anger due to the illness is higher in men than in women. They demonstrated that men make less effort than women to solve their problems and instead try to ignore and deny illnesses [15]. Moreover, the study by Kring and colleagues showed that the

level of anger upon being diagnosed with an illness is higher in men compared to women [16]. However, other studies have indicated the opposite, suggesting that the levels of stress, anxiety, and depression are higher in women than in men when diagnosed with an illness [17, 18]. These discrepancies in the results may arise from differences in the study populations, study periods, types of illnesses, and varying cultural and social factors in the research environments.

The results of the present study indicated that the average scores of denial, anger, rumination, and depression were significantly higher in married and single patients compared to divorced patients. Additionally, the average acceptance score was significantly higher in married and divorced patients compared to single patients.

Consistent with this finding, the study by Liu and colleagues demonstrated that married individuals, both men and women, were more likely to experience anger, anxiety, and depression compared to single individuals [19]. Moreover, the study by Lutgendorf and colleagues also supported this finding by showing that married individuals exhibited more denial and anger compared to single individuals when facing illness and unfavorable mental and emotional conditions [19]. However, contrary to the present study, the results of the study by Kornstein and colleagues showed that the levels of anxiety, anger, and denial were higher in single patients compared to married patients. This study also highlighted that marital status and the possibility of having a stable emotional relationship could serve as protective factors in managing anxiety and anger in patients with illness [20].

The results of the present study also showed that the average denial score was significantly lower in university-educated patients, and the average depression score was significantly lower in illiterate patients compared to other patients. Additionally, the average anger score was significantly higher in non-university-educated patients, and the average acceptance score was significantly higher in university-educated patients compared to other patients. Elizabeth Kubler-Ross's theory of the depression stage, suggesting that the onset of the depression stage might signal the end of the acceptance process of the disease [21]. Thus, lower levels of depression in illiterate patients in the COVID-19 unit may lead to less acceptance of the illness and a higher prevalence of denial behaviors in these individuals.

Consistent with the present study, Bairwa and colleagues showed in their study that individuals with higher levels of education are more inclined towards awareness, prevention, and treatment of COVID-19 and exhibit more accepting behaviors [22]. Additionally, the results of the study by Dryhurst and colleagues also align with the current study's findings. They investigated the relationship between education level and denial of COVID-19 in patients. Their findings indicated that denial and non-acceptance behaviors were more prevalent in individuals with lower levels of education [23]. However, due to the lack of similar studies, comparing these findings with non-concurrent studies is not feasible.

The results of the present study showed that the average scores of anger and rumination were significantly higher in patients hospitalized for more than 3 days compared to those hospitalized for 1 to 3 days. In line with this finding of the present study, Chen *et al.* (2021) found that patients with

COVID-19 who were hospitalized for longer periods reported higher levels of anxiety and depression compared to those with shorter hospital stays [24].

However, contrary to this finding of the present study, the results of the study by Kuo *et al.* (2020) regarding healthcare workers' emotional experiences of COVID-19 patients showed that healthcare workers experience high levels of stress, anxiety, and depression, which can affect the quality of care they provide. In a way, the length of hospitalization of patients depends on the quality of care provided by medical personnel [25].

5. LIMITATIONS OF THE STUDY

Like other studies, the present research has its limitations. One of the most significant limitations is the scarcity of resources and previous research in the field of psychological effects of the COVID-19 pandemic, especially in Iran, making it difficult to compare the findings of the present study with other concurrent or non-concurrent studies. Considering the role of cultural and geographical differences in different parts of Iran and other countries, it is important to be cautious when generalizing the results, and if possible, conducting similar studies in other areas to compare the cultural and social differences. Furthermore, the time frame of this study was at the beginning of the fifth wave of COVID-19 in Iran, when recommendations for home quarantine were in effect. It is possible that as the situation prolonged, individuals might exhibit different psychological reactions, which the current cross-sectional study design could not assess. Future researchers are advised to consider this aspect in their studies. Additionally, the method of data collection in this study was through a quantitative questionnaire-based survey. Other limitations of this study include the short duration of the study, self-reporting method, small sample size, and the physical and mental conditions of the patients during the study period.

CONCLUSION

Our findings provide scientific and practical insights to assist medical professionals and government authorities in predicting the emotional responses of COVID-19 patients. These insights can serve as a basis for guidelines to develop effective programs and policies during critical situations such as pandemics. Generally, mental health issues become crucial during pandemics. The ability to predict how people respond to diseases, pandemics, and crises helps in planning effective interventions for similar situations in the future.

As COVID-19 infection and hospitalization in COVID-19 units are associated with various emotional and personality changes, health managers and policymakers are recommended to prioritize screening patients for emotional and personality changes. Understanding these changes can lead to accurate diagnosis and effective treatment for these patients.

ABBREVIATION

(COVID-19) = Coronavirus

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This article reports the results of a research project approved by Mashhad University of Medical Sciences with the code of ethics (IR.MUMS.FHMPM.REC.1401.007).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

STROBE guideline has been followed.

AVAILABILITY OF DATA AND MATERIALS

The data sets used and analysed during this study are available from the corresponding author [R.R.] upon request.

FUNDING

This study was funded by Mashhad University of Medical Sciences (Awards/Grant number. 4001312).

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to the honorable Vice-chancellor for Research of Mashhad University of Medical Sciences, the honorable officials of 22nd-Bahman Hospital in Khaf, the participants, and all the people who helped us in conducting this research.

REFERENCES

- Ashrafi-Rizi H, Kazempour Z. Information typology in coronavirus (COVID-19) crisis; A commentary. *Arch Acad Emerg Med* 2020; 8(1): e19. [PMID: 32185370]
- Huang C, Wang Y, Li X, *et al*. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020; 395(10223): 497-506. [http://dx.doi.org/10.1016/S0140-6736(20)30183-5] [PMID: 31986264]
- Anthony M. Context in artificial intelligence: I. A survey of the literature. *ACM* 2008; 18(4) [http://dx.doi.org/10.1163/9789087905101_002]
- Mollayousefi M, Bagheri M. The modern human and the Problem of death: A study of Elisabeth Kubler-Ross' Theory. *J Relig Stud* 2017; 10(20): 133-50.
- Valliani K, Mughal FB. Human emotions during COVID-19: A lens through Kubler-Ross Grief theory. *Psychol Trauma* 2022; 14(2): 247-9. [http://dx.doi.org/10.1037/tra0001064] [PMID: 34323565]
- Bernau JA. The institutionalization of kubler-ross's five-stage model of death and dying. *Omega* 2022. [http://dx.doi.org/10.1177/00302228221098893] [PMID: 35549540]
- Kubler-Ross E, Kessler D. On grief and grieving: Finding the meaning of grief through the five stages of loss. Simon and Schuster 2005.
- Corr CA. Should we incorporate the work of elisabeth kubler-ross in our current teaching and practice and, if so, how? *Omega* 2021; 83(4): 706-28. [http://dx.doi.org/10.1177/0030222819865397] [PMID: 31366311]
- Corr DM, Corr CA. Elisabeth Kübler-Ross and the 5 stages model in a sampling of recent North American nursing textbooks. *J Hosp Palliat Nurs* 2020; 22(1): 61-7. [http://dx.doi.org/10.1097/NJH.0000000000000615] [PMID: 31804279]
- Kalichman SC, Rompa D, DiFonzo K, *et al*. HIV treatment adherence in women living with HIV/AIDS: research based on the Information-Motivation-Behavioral Skills model of health behavior. *J Assoc Nurses AIDS Care* 2001; 12(4): 58-67. [http://dx.doi.org/10.1016/S1055-3290(06)60217-3] [PMID: 11486721]
- Vos MS, De Haes J. *Denial in cancer patients, an explorative review*. *Psycho-Oncology: Journal of the Psychological, Social and Behavioral Dimensions of Cancer* 2007; 16(1): 12-25.
- Bavel JJV, Baicker K, Boggio PS, *et al*. Using social and behavioural science to support COVID-19 pandemic response. *Nat Hum Behav* 2020; 4(5): 460-71. [http://dx.doi.org/10.1038/s41562-020-0884-z] [PMID: 32355299]
- Kim D, Park C, Kim E, Han J, Song H. Social sharing of emotion during the COVID-19 pandemic. *Cyberpsychol Behav Soc Netw* 2022; 25(6): 369-76. [http://dx.doi.org/10.1089/cyber.2021.0270] [PMID: 35639371]
- Kumar P. Prevalence of anxiety and depression among COVID-19 patients admitted to tertiary care hospital. *Indian J Soc Psychiatry* 2021; 37(1)
- Addis ME, Mahalik JR. Men, masculinity, and the contexts of help seeking. *Am Psychol* 2003; 58(1): 5-14. [http://dx.doi.org/10.1037/0003-066X.58.1.5] [PMID: 12674814]
- Kring AM, Gordon AH. Sex differences in emotion: Expression, experience, and physiology. *J Pers Soc Psychol* 1998; 74(3): 686-703. [http://dx.doi.org/10.1037/0022-3514.74.3.686] [PMID: 9523412]
- Albert PR. Why is depression more prevalent in women? *J Psychiatry Neurosci* 2015; 40(4): 219-21. [http://dx.doi.org/10.1503/jpn.150205] [PMID: 26107348]
- Kuehner C. Why is depression more common among women than among men? *Lancet Psychiatry* 2017; 4(2): 146-58. [http://dx.doi.org/10.1016/S2215-0366(16)30263-2] [PMID: 27856392]
- Liu H, Umberson DJ. The times they are a changin': Marital status and health differentials from 1972 to 2003. *J Health Soc Behav* 2008; 49(3): 239-53. [http://dx.doi.org/10.1177/002214650804900301] [PMID: 18771061]
- Kornstein SG, Schatzberg AF, Thase ME, *et al*. Gender differences in treatment response to sertraline versus imipramine in chronic depression. *Am J Psychiatry* 2000; 157(9): 1445-52. [http://dx.doi.org/10.1176/appi.ajp.157.9.1445] [PMID: 10964861]
- Corr CA. Elisabeth Kübler-Ross and the "five stages" model in a sampling of recent American textbooks. *Omega* 2020; 82(2): 294-322. [http://dx.doi.org/10.1177/0030222818809766] [PMID: 30439302]
- Bairwa M, Kumar R, Yadav P, Bahurupi Y, Kant R. Awareness, perception, and mitigating measures on COVID-19: Do we still need to educate our masses on COVID-19? *J Educ Health Promot* 2021; 10: 275. [PMID: 34485572]
- Dryhurst S, Schneider CR, Kerr J, *et al*. Risk perceptions of COVID-19 around the world. *J Risk Res* 2020; 23(7-8): 994-1006. [http://dx.doi.org/10.1080/13669877.2020.1758193]
- Tomfohr-Madsen LM, Racine N, Giesbrecht GF, Lebel C, Madigan S. Depression and anxiety in pregnancy during COVID-19: A rapid review and meta-analysis. *Psychiatry Res* 2021; 300: 113912. [http://dx.doi.org/10.1016/j.psychres.2021.113912] [PMID: 33836471]
- Lim SY, Chang SO. The conceptual structure of the management by nurses of the ego integrity of residents of nursing homes. *J Nurs Res* 2020; 28(6): e123. [http://dx.doi.org/10.1097/jnr.0000000000000394] [PMID: 32501961]

