


ORIGINAL PAPER

Infectious Diseases

Effect of COVID-19 pandemic on anxiety depression and intention to go to hospital in chronic patients

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Abstract

Objective: The aim of this study was to investigate the effects of the COVID-19 pandemic on anxiety depression and intention to go to the hospital in chronic patients.

Methods: The Bostan Intention to Go to Hospital Scale developed by one researcher (SB) as the data collection tool and the Beck Anxiety-Depression Inventories were used.

Results: Of all patients, 56.8% stated that they would go to the hospital in case of emergency and 28.3% expressed that they did not want to go to the hospital even in this case. 50% of the participants said that they did not want to go to the hospital under any circumstances during the pandemic process. As a result of the correlation analysis, there was an inverse correlation between the anxiety-depression levels and encountering COVID-19 patients and having a relative with COVID-19 ($P = .001$). Inverse correlation was found between intention to go to hospital and encountering COVID-19 patients ($P = .001$).

Conclusion: It was revealed that chronic patients did not have any intentions to go to hospital during the COVID-19 pandemic and only half of the people were willing to go to the hospital in case of emergency. Anxiety and depression levels were found to increase when COVID-19 patients were encountered or a relative had COVID-19.

What's known

- Anxiety and depression are observed more often in chronic diseases such as diabetes mellitus, asthma and chronic obstructive pulmonary disease (COPD) compared with the normal population.
- It is stated in publications that anxiety and depression worsen the clinical course of many diseases including COVID-19.

What's new

- The intention of chronic patients to go to the hospital during the pandemic process is very low.
- The health problems are postponed until after the pandemic will become more intense and become more complicated.
- It is necessary to provide social support services for controlling the concerns of chronic patients about COVID-19 within the framework of preventive psychological services.

1 | INTRODUCTION

Pandemic is a name given to contagious diseases seen in many countries across the world and show their effect in a wide area of the world. Throughout the history of humanity, pandemics have been observed to have highly serious effects on people's lives and cause major events that result in deaths.¹ Amongst the pandemics that have broken out in the world recently are SARS-CoV 2003, Influenza A H1N5 2007, Influenza A H1N1 2009, MERS-CoV 2012, Influenza A H7N9 2013 and Ebola 2014-16.¹⁻⁶

Coronaviruses are RNA viruses that can infect humans and various animal species. Coronaviruses, which cause common cold by 35% every year, can rarely be fatal.^{1,7} The new Coronavirus types, which have started to appear since 2002, have begun to manifest themselves with a more severe flu-such as respiratory tract infection, unlike common cold and led to three major pandemics over the last 20 years: SARS, MERS and COVID-19.^{1,8} In the literature, it has been reported that the molecular structure of coronaviruses cannot be explained fully and they can mutate relatively easily at the genetic level. It is expressed that these viruses can recombine quite easily in the same cell and such mutations can turn into viruses that lead to pandemics such as SARS-CoV and COVID-19.¹ The COVID-19 pandemic was first seen in the city of Wuhan in China in December 2019. On February 11, 2020, the World Health Organization named this new virus as SARS-CoV-2, and the pandemic as the "Covid-19 pandemic".^{1,9-12}

Anxiety is a state of emotion emerging with several psychopathologies dominated by fear and concern.¹³ Depression, moreover, is a condition that includes feelings and thoughts such as slowdown and inactivity in thought, speech and movements, worthlessness, smallness, unwillingness and pessimism, and symptoms such as slowdown in physiological functions.¹³ Anxiety and depression are observed more often in chronic diseases such as diabetes mellitus, cancer, cardiovascular diseases, asthma, chronic obstructive pulmonary disease (COPD, and systemic lupus erythematosus compared with the normal population.¹⁴⁻²⁰ It has also been reported in the studies that anxiety and depression disrupt glycemic control, make the treatment difficult and increase the risk of hospitalisation with complications such as severe hypoglycemia and diabetic ketoacidosis in patients with diabetes, lead to recurrent cardiovascular events and the increased risk for mortality in cardiovascular diseases and cause cardiotoxic effects of the depressive symptoms to be observed continuously despite the continuous recovery in cardiovascular interventions, impair the quality of life and are correlated with the increased mortality risk in COPD patient and complicate the control of asthma in asthma patients. It is stated in publications that anxiety and depression worsen the clinical course of many chronic diseases.^{18,19,21,22}

In previous pandemic situations, serious mental health problems (such as anxiety, depression and chronic fatigue syndrome) have been demonstrated in all groups from healthcare professionals to patient groups.²³ In addition, it has been shown that human mental health is affected by varying degrees in the general population

during the COVID-19 pandemic.²⁴ The aim of this study was to investigate the effects of the COVID-19 pandemic on anxiety depression and intention to go to the hospital in chronic patients.

2 | MATERIALS AND METHODS

This study was designed as a descriptive study and conducted by the survey method. The study aimed at measuring the levels of the influence of the pandemic on chronic patients compared with those without a chronic disease over the scales of anxiety, depression and intention to go to the hospital.

2.1 | Population and sample

Since the study prioritised chronic patients, a total of 396 participants above the age of 40, including 206 participants with chronic diseases and 190 participants with no chronic diseases, were included in the study sample within the scope of the purposeful sampling method. Of the participants, 63.6% were women and 36.4% were men, 93.4% were aged between 40 and 49 and 6.6% were aged 50 and above, 29.8% were single, 64.1% were married and 6.1% were either divorced or lost their husbands, 93.1% were living with their families and 6.9% were living alone.

Patients with known psychiatric diseases and using psychiatric drugs were excluded from the study.

2.2 | Data collection scales, process and scale analyses

In the research, a questionnaire consisting of the socio-demographic characteristics, Beck anxiety inventory, Beck depression inventory and intention to go to the hospital scale was used as data collection tools. Permission was obtained from the Clinical Practices Ethics Committee and the Ministry of Health for the application of the questionnaire. Participants voluntarily filled the questionnaire, which was prepared on the internet environment, in their own environments via mobile phones. The fact that it was an extraordinary period, there was no chance to conduct a face-to-face survey and people were under stress constituted the limitation in the collection of the research data.

The Beck anxiety inventory and the Beck depression inventory are quadruple rated scoring scales and anxiety or depression level increases as the score level increases. The Bostan Intention to go to Hospital Scale is a five-point Likert-type questionnaire scored from I Strongly Disagree (1) to I Strongly Agree (5). As the score level decreases, the intention to go to the hospital decreases, and as the score level increases, the intention to go to the hospital increases. Encountering a COVID-19 patient and having a relative with COVID-19 was scored 1, and encountering no COVID-19 patients and having no relatives with COVID-19 was scored 2.

As the Beck anxiety inventory, Beck depression inventory and Bostan intention to go to the hospital scale were rated scales, their validity was confirmed via the factor analysis. Validity is the measurement degree of a test or scale.²⁵ Besides, their reliability analyses were performed through Cronbach's alpha method. The results of the factor analysis of the scales are given in Table 1.

When Table 1 is examined, the KMO sampling coefficients of the three scales are observed to be above 0.80. As the KMO value gets closer to 1, the sample size used in the study reaches perfection and for this value, 0.80 is considered to be very good and 0.90 perfect.²⁶ The result of Bartlett's Test of Sphericity, which was used to evaluate the suitability of the scale for factor analysis, was found to be significant ($P = .000$). Accordingly, the scales are suitable for factor analysis. It was understood that the factor loads of the three scales were generally high and their strength to explain the total variance, 45.607, 46.825 and 47.368, was found adequate. Since Cronbach's alpha coefficients of the scales were above 0.80, they were considered to be highly reliable.

In the writing of the findings, the level of cardiologists' participation in expressions was used as percentage or arithmetic means. Arithmetic means are shown in parentheses. Since the scale is a five-point Likert, the levels of arithmetic averages are: 1-1.8 very low participation; Low participation of 1.9-2.6; 2.7-3.4 medium participation; 3.5-4.2 high participation; 4.3-5 was considered to be very high participation.

SPSS statistical software was used to test the aims of the study. The analyses were performed in the 95% ($P = .05$) confidence interval. Descriptive statistical methods and correlation analysis were used in the study.

3 | RESULTS

Other descriptive information of chronic patients and people without chronic diseases, who patients in the research, are given in Table 2. When Table 2 was examined, it was discovered that, of 206 chronic patients, 28.7% had chronic pulmonary diseases, 21.29% had hypertension, 15.27% had coronary artery diseases, 15.27% had

diabetes and 19.47% had other chronic diseases. Of the participants, 10.9% encountered a coronavirus case, a relative of 14.6% was infected with Coronavirus, 6.3% had Coronavirus test and five of them got positive test results.

The anxiety levels of the participants during the pandemic process are given in Table 3. When the table was examined, it was observed that 63.6% of the participants did not have anxiety symptoms, 19.2% had mild, 10.4% had moderate and 6.8% had severe anxiety symptoms.

The depression levels of the participants during the pandemic process are given in Table 4. When the table was examined, it was seen that 58.8% of the participants did not have depression symptoms, 19.7% had mild, 13.1% had moderate and 8.3% had severe depression symptoms.

The Frequency Distribution of the Bostan Intention to Go to Hospital Scale in which the participants stated the situations they had an intention to go to the hospital during the pandemic process, is given in Table 5. When the table was examined, participants with or without chronic diseases stated that they would not go to the hospital in the following cases: 92.2% out of curiosity, 88.8% to visit a relative, 74.5% to get medicine prescribed, 84.1% for tests, 73.5% for routine control, 86.1% for a slight sickness and 56.1% in case of a little progress in their sickness.

Of the participants, 28.3% stated that they would not go to the hospital if their sickness progressed, 52.7% might go to hospital and 17.1% were not sure. Only 56.8% of the participants expressed that they would go to the hospital in case of emergency and 28.3% did not want to go to the hospital even in that case. Of the patients, 50% said that they did not want to go to the hospital under any circumstances during the pandemic process. This indicated that patients did not intend to go to the hospital during the pandemic process, and only half of the people were willing to go to the hospital even in compulsory situations. It is clear that an important health risk will occur for the individuals if they disrupt their diagnosis, check-up and treatments because of their fear of pandemic. When the case is evaluated in terms of health institutions and hospitals, it should be known that the health problems postponed until after the pandemic

Factor analysis	Beck anxiety	Beck depression	Bostan intention to go to the hospital
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.929	0.947	0.852
Bartlett's Test of Sphericity			
Approx. Chi-Square	5125.16	4655.292	1860.099
Df	210	210	45
Sig.	0.000	0.000	0.000
Factor load range	559-779	419-784	553-784
Total variance explained			
%	45.607	46.825	47.368
Cronbach's alpha	0.937	0.940	0.869

TABLE 1 Validity and reliability analyses of the scales

TABLE 2 Frequency table of participants descriptive variables

Variables	N	%	Variables	N	%
Do you have a Chronic Disease or condition that requires medical follow-up?			Have you ever encountered a COVID-19 patient?		
Yes	206	52	Yes	43	10.9
No	190	48	No	353	89.1
What is your Chronic Disease or condition that requires medical follow-up?			Has any of your relatives become a COVID-19 patient?		
Chronic Obstructive Pulmonary Disease / Asthma	62	28.70	Yes	58	14.6
Hypertension	46	21.29	No	338	85.4
Coronary artery disease	33	15.27	Have you had a COVID-19 test?		
Diabetes mellitus	33	15.27	Yes	25	6.3
Other	42	19.47	No	371	93.7
• Cancer	5	2.31	If you did it, the result?		
• Mediterranean fire	5	2.31	Positive	5	20.8
• Allergic diseases	6	2.70	Negative	19	79.2
• Behcet	2	0.92			
• Celiac	2	0.92			
• Ulcers/gastritis	5	2.31			
• Rheumatic disease	7	3.24			
• Thyroid disease	4	1.85			
• Chronic renal failure	6	2.70			

TABLE 3 Evaluation of the participants' Beck anxiety inventories

Back anxiety scale result	N	%
None	252	63.6
Light	76	19.2
Moderate	41	10.4
Severe	27	6.8

TABLE 4 Evaluation of participants' Beck depression inventories

Back depression scale result	N	%
None	233	58.8
Light	78	19.7
Moderate	52	13.1
Severe	33	8.3

will bring an additional burden to the health system with more intensity and complexity.

The presence of a distinctive aspect of the variables related to demographic, chronic disease and COVID-19 on the scales was researched by t and ANOVA tests. It was revealed that the participants' training, ages and people they lived with did not have an effect on the scales. It was seen that female participants (2.09) had less intention to go to the hospital than men (2.35) at an error level of $P = .003$, single participants (1.64) had higher depression levels than married ones (1.47) at the error level of $P = .007$ and single participants (1.95) had lower intentions to go to hospital compared with married ones (2.27) at the error level of $P = .000$. Of the participants,

chronic patients (2.32) were found to have higher intentions to go to the hospital than those without any chronic diseases (2.03), at the error level of $P = .000$. It was discovered that, of the chronic patients, those who had two (2.71) or three (2.47) chronic diseases together had higher intentions to go to hospital compared with those without chronic diseases (2.02) at the error level of $P = .005$. No significant difference was found between chronic patients according to their disease types ($P = .627$).

Anxiety (1.71) and depression levels (1.89) of the participants who encountered COVID-19 patients and their intentions to go to the hospital (2.65) were found to be higher than the anxiety levels (1.33) and depression levels (1.48) of those who did not encounter COVID-19 patients and their intentions to go to the hospital (2.13) at the error level of $P = .000$. Anxiety levels (1.59) and depression levels (1.81) of the participants having a relative with COVID-19 were found to be higher than the anxiety levels (1.34) and depression levels (1.48) of those having no relatives with COVID-19 at the error level of $P = .000$.

Correlation analysis was conducted to identify the correlation between the scales of the research and the variables of encountering a COVID-19 patient and having a relative with COVID-19 and the results are given in Table 6. When Table 6 was examined, it was understood at the error level of $P = .001$ that there was a high, linear correlation between the anxiety levels and depression levels of the participants, and there was a weak, inverse correlation between the anxiety level, encountering a COVID-19 patient and having a relative with COVID-19. Accordingly, it was found that the individuals' level of depression increased as their level of

TABLE 5 Frequency distribution of the Bostan intention to go to hospital scale in the COVID-19 pandemic

Statements	Evaluation of the Bostan intention to go to hospital scale in the COVID-19 pandemic										\bar{x}	SD
	I strongly disagree		I disagree		I partially agree		I agree		I strongly agree			
	n	%	n	%	n	%	n	%	N	%		
During COVID-19 pandemic, I go to the hospital as I wonder about the patients' conditions.	317	80.1	48	12.1	16	4	3	0.8	12	3	2.18	0.82
During COVID-19 pandemic, I go to the hospital to visit a relative.	284	71.7	68	17.2	26	6.6	5	1.3	13	3.3	1.34	0.84
During COVID-19 pandemic, I go to hospital to get my medicine prescribed.	218	55.1	77	19.4	56	14.1	15	3.8	30	7.6	1.47	0.92
During COVID-19 pandemic, I go to the hospital to have tests and examinations in my mind.	252	63.6	81	20.5	32	8.1	13	3.3	18	4.5	1.89	1.23
During COVID-19 pandemic, I go to the hospital for an appointment that my doctor gave me for a routine check-up.	199	50.3	93	23.5	45	11.4	22	5.6	37	9.3	1.64	1.06
During COVID-19 pandemic, I go to the hospital if I feel sick.	267	67.4	74	18.7	25	6.3	8	2	22	5.6	2.0	1.29
During COVID-19 pandemic, I go to the hospital if my sickness gets a bit worse.	127	32.1	95	24	100	25.3	33	8.3	41	10.4	1.59	1.07
During COVID-19 pandemic, I go to the hospital when my sickness becomes serious.	65	16.4	54	13.6	68	17.2	71	17.9	138	34.8	2.4	1.29
During COVID-19 pandemic, I go to the hospital only if I have an emergency.	52	13.1	60	15.2	59	14.9	55	13.9	170	42.9	3.41	1.48
During COVID-19 pandemic, I never the go to hospital.	112	28.3	86	21.7	123	31.1	27	6.8	48	12.1	2.52	1.29

TABLE 6 Correlation analysis results

	Anxiety	Depression	Intention to go to hospital	Encountering a COVID-19 patient	Having a relative with COVID-19
Anxiety	1				
Depression	0.756 (**)	1			
Intention to go to the hospital	0.097	0.091	1		
Encountering a COVID-19 patient	-0.249 (**) ^a	-0.228 (**) ^a	-0.199 (**) ^a	1	
Having a relative with COVID-19	-0.185 (**) ^a	-0.207 (**) ^a	-0.084	0.315 (**)	1

^aImportant Note: Since the condition of encountering a COVID-19 patient and having a relative with COVID-19 was scored 1 and the condition of encountering no COVID-19 patients and having no relatives with COVID-19 was scored 2, these correlations appeared inverse.

**Correlation is significant at the 0.01 level (2-tailed).

anxiety increased, and their anxiety and depression levels were found to increase when they encountered a COVID-19 patient or had a relative with COVID-19. Similarly, a weak, inverse correlation was observed between the depression level of the participants, encountering a COVID-19 patient and having a relative with

COVID-19 at the error level of $P = .001$. Thus, it was determined that the depression levels of the individuals increased if they encountered a COVID-19 patient or had a relative with COVID-19. A weak, inverse correlation was found between participants' intention to go to the hospital and encountering a COVID-19 patient,

at the error level of $P = .001$. The intention of the participant who encounters a COVID-19 patient to go to hospital increases. Again, a weak, linear correlation was observed between encountering a COVID-19 patient and having a relative with COVID-19 at an error level of $P = .001$.

4 | DISCUSSION

In the research, the correlation between the patients' levels of anxiety and depression and intentions to go to hospital and COVID-19 was evaluated. In the studies, depression was detected by 41.2% and anxiety by 36.4% in the participants. In the literature, it has been reported that the co-occurrence rates of these two diseases are high, they trigger each other and generally develop because of common causes.^{2-4,27} Similarly, depression and anxiety accompanied each other in the study and their incidence was found to be very high. In a study, major depression was observed in 83.7% of patients diagnosed with anxiety.^{3,28}

The prevalence of anxiety disorder is about 5% in the general population whereas it increases up to 10% with old age.^{1,2,28} The rate of 36.4% reached in the study is very high. Moreover, the rate of depression in the general population was found to be between 3.6% and 8.5%.²⁹ Again, the rate of 41.2% reached in the study is very high. This may be associated with the evaluation rates of participants' intention to go to the hospital in the COVID-19 pandemic, because only 56.8% of the participants expressed that they would go to the hospital in case of emergency, and 28.3% did not want to go to the hospital even in that case. Again, 50% of the participants stated that they did not want to go to the hospital under any circumstances during the pandemic process. Therefore, it is important for chronic patients to be able to tell their complaints and be directed remotely, without applying to the emergency department or outpatient clinics.³⁰ However, serious problems are faced in how to manage diseases that may result in serious morbidity and mortality, such as cardiovascular disease, in tight isolation and limited mobility with calls to stay home in the pandemic process.³¹ Quick integration of the most convenient method such as telemedicine and artificial intelligence and virtual triage into the available traditional patient diagnosis and treatment management system is necessary for emergencies such as pandemics.³²

In many studies during the COVID-19 epidemic, it has been shown that serious mental health problems develop in the health-care workers, healthy population, psychiatric patients and especially in those with chronic diseases.^{23,33} Many factors are thought to cause mental health problems, and one of them, health care needs of non-emergency patients were a lower priority when the number of COVID-19 cases rose sharply. Another one is that because of the possibility of insufficiency of health institutions and the risk of the disease spread, non-urgent patients were encouraged not to apply to hospitals. During the COVID-19, the inability of chronic patients to reach healthcare services adequately because of such reasons has caused higher levels of anxiety and depression in this patient group

compared with healthy controls.³³ Moreover, it was thought that the increase in proinflammatory cytokines caused by psychological stress in patients with chronic diseases may cause anxiety and depression in these patients.³⁴ In this study, depression was observed in 21.4% of the participants at moderate and severe levels, and anxiety was seen in 17.2% at moderate and severe levels. Similarly, in another study involving 1210 people from 194 cities in China, the psychological responses of patients (psychological impact, anxiety, depression and stress) were assessed. Accordingly, 53.8% of the participants rated the psychological impact of the pandemic as moderate or severe. Additionally, moderate and severe depressive symptoms were observed in 16.5% of the participants, moderate and severe anxiety symptoms in 28.8% and moderate and severe stress levels in 8.1%.³⁵

Of the participants, chronic patients (2.32) were found to have higher intentions to go to the hospital than those without any chronic diseases (2.03) ($P = .000$). This situation can be explained by the problems caused by the symptoms appearing because of the progress of the chronic disease, which can be fatal.

As a result of the correlation analysis, it was discovered that there was a linear correlation with the anxiety and depression level, and a weak, inverse correlation ($P = .001$) with encountering a COVID-19 patient and having a relative with COVID-19. Accordingly, it was found that the individuals' level of depression increased as their level of anxiety increased, and their anxiety and depression levels increased when they encountered a COVID-19 patient or had a relative with COVID-19. This situation coincides with the literature data suggesting that depression and anxiety are usually seen together,^{4,27} and depression is triggered after anxiety.²⁷

A weak, inverse correlation was discovered between the participants' intentions to go to the hospital and encountering a COVID-19 patient ($P = .001$). The intention of the participant who encounters a COVID-19 patient to go to hospital increases. This can be explained by the increased level of anxiety and depression when a COVID-19 patient is encountered.

With the COVID-19 epidemic, health systems all over the world have become questionable again. Rapid spread of the infection worldwide and lack of staff and equipment have caused serious problems in the functioning of hospitals.³⁶ Whereas the whole world has focused especially on the solution of the health problems of infected patients, solution of health-related problems of especially chronic patients who are not actually infected might have been seriously impaired. This has caused increased psychiatric problems as well as health-related problems in the non-infected group.²³ As we have learned from the pandemic, using different methods in the delivery of basic health care services and especially psychiatric support services to non-infected people will be beneficial. This should include new approaches in the pre-assessment such as virtual triage, telemedicine techniques and artificial intelligence. Supporting this, Internet-based therapy has been shown to be effective in the treatment of depressive symptoms.³⁷ Although medical approaches require face-to-face contact with the patient and in-person physical exams, we believe that telemedicine techniques would be useful in

listening to initial complaints of the patients and at least providing basic support in mandatory conditions such as pandemics.

4.1 | Limitation

This study is cross-sectional in nature. The most important limitation is the usage of only online systems as the data collection tool as the test could not be applied face-to-face because of social isolation. Therefore, it mostly reflects the views of patients who use social media well. In addition, in this study, the psychiatric symptoms of the participants were evaluated but no clinical diagnosis was made. Participants could not be evaluated by clinical interview or functional neuroimaging.

5 | CONCLUSION

It was found out that the intentions of chronic patients to go to the hospital during the pandemic process were very low, and only half of the patients were willing to go to the hospital even in compulsory situations. Individuals' disruption of their diagnosis, check-up and treatments because of their fear of the pandemic will pose a great health risk. The health problems that are postponed until after the pandemic will become more intense and complicated, which will bring additional burden for health institutions and hospitals. Therefore, it was revealed in the study that anxiety triggers depression and their co-progress affects the intention of a chronic patient to go to the hospital. In this direction, it is necessary to provide social support services for controlling the concerns of chronic patients about COVID-19 within the framework of preventive psychological services.

It would be useful to include anxiety and depression diagnosis and treatment in routine treatment procedures in chronic patients and to conduct studies involving individual and group psychotherapies. In extraordinary situations (earthquakes, wars and natural disasters), as well as pandemics, carrying out a study within the scope of a protocol by making a service-specific plan will improve efficiency. Quick integration of the most convenient method, such as telemedicine and artificial intelligence and virtual triage, into the available traditional patient diagnosis and treatment management system, is necessary for emergencies such as pandemics.

ACKNOWLEDGEMENTS

Thank ResearchSquare platform for publishing our article as a preprint version at the following link: [d6d61e24-6c36-4990-964b-cc5d8f0866de.pdf](https://doi.org/10.21956/2020.01.01.20000001) (researchsquare.com)

DISCLOSURE

No conflict of interest was declared by the authors.

DATA AVAILABILITY STATEMENT

Data used in this study are included in the manuscript.

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How to cite this article: Kaya Y, Bostan S, Kaya A, Karaman Ö, Karataş A, Dereli S. Effect of COVID-19 pandemic on anxiety depression and intention to go to hospital in chronic patients. *Int J Clin Pract*. 2021;75:e14219. <https://doi.org/10.1111/ijcp.14219>