



SARS-CoV-2 Omicron variant; psychological effect and influencing factors in elderly patients

Jamshid Eslami¹, Giti Setoodeh², Sara Dehghan³, Yaser Khanchemehr⁴, Reyhaneh Sadeghian⁴, Mahsa Asadollahi Hamedani⁴, Mohamad Khaledi⁵, Mobin Mohammadtabar⁵, Najmeh Parsai⁶

¹Department of Operating Room, Nursing School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran

²Department of Psychiatric Nursing and Mental Health, Shiraz University of Medical Sciences, Shiraz, Iran

³Department of Nursing, Shariati Hospital, Faculty of Nursing and Midwifery, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

⁴Department of Nursing, Faculty of Nursing and Midwifery, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

⁵Department of Ophthalmology, School of Medicine, Baqiyatallah University of Medical Sciences, Tehran, Iran

⁶Student Research Committee, Faculty of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran

*Correspondence to

Najmeh Parsai,

Email:

NajmehParsai99@gmail.com

Received 2 Feb. 2023

Accepted 8 Mar. 2023

Published online 14 Mar. 2023

Keywords: COVID-19, Anxiety, Aged people, Psychological effect, COVID-19 vaccines, SARS-CoV-2 omicron variant

Abstract

Introduction: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) Omicron variant appeared in South Africa for the first time. The high prevalence of its mortality in elderly patients has caused an increase in anxiety triggered by this disease in aged people.

Objectives: The aim of this study is to evaluate the anxiety related-COVID-19 in the SARS-CoV-2 Omicron variant and its related factors in elderly patients who are candidates for cataract surgery.

Patients and Methods: This descriptive-analytical study was conducted on 159 over 65 years old patients who are candidates for cataract surgery. Easy and accessible sampling methods were employed to select samples. Demographic characteristics sheet and the Corona Disease Anxiety Scale (CDAS) questionnaire were filled out by them. Fisher's exact test, Mann-Whitney U and binary logistic regression tests were conducted for data analysis.

Results: The results showed that out of 159 patients, 57.9% were female, with a mean age of 73.09 ± 9.64 years. The anxiety level of 70.4% of patients was mild or non-anxiety and 29.6% was moderate or severe. The correlation between anxiety related to COVID-19 with age, gender, vaccination status and history of being infected by COVID-19 was significant ($P < 0.05$); however, the correlation with the job, place of residence and marital status were not significant ($P > 0.05$).

Conclusion: We concluded that older age, female gender, non-vaccinated and having no history of being infected by COVID-19 are the most influential factors that increase anxiety triggered by COVID-19 in elderly patients.

Citation: Eslami J, Setoodeh G, Dehghan S, Khanchemehr Y, Sadeghian R, Asadollahi Hamedani M, Khaledi M, Mohammadtabar M, Parsai N. SARS-CoV-2 Omicron variant; psychological effect and influencing factors in elderly patients. *Immunopathol Persa*. 2023;x(x):e39491. DOI:10.34172/ipp.2023.39491.

Introduction

Since December 2019, the COVID-19 pandemic has impacted people's lives worldwide. The rapid production and global distribution of vaccines and drugs based on monoclonal antibodies have greatly helped to prevent and control this pandemic (1). However, on November 24, 2021, a new type of SARS-CoV-2, named Omicron, appeared in South Africa and made a new worldwide challenge (2). Previous studies on the Omicron variant showed that the mutation rate of this virus is alarming because it would be able to evade the immune system and cause more contagious infections. This virus was also able to involve resistant people to previous strains, increase the new type of infected COVID-19 patients around the world and initiate fear and uncertainty about the effectiveness of prevention and treatment methods (3,4). On the other hand, its rapid spread and high

Key point

In a descriptive-analytical study, we found that the most influencing factors on increasing anxiety related-COVID-19 in elderly patients who were candidates for cataract surgery were included female gender, older age, having no history of being infected by the COVID-19 virus and being not-vaccinated.

mortality have caused an increase in worry, anxiety and exacerbation of mental disorders (5).

Among COVID-19 patients, elderly patients had a higher mortality rate due to renal involvement and symptomatic infection rate. Approximately 80% to 90% of COVID-19 deaths occurred in elderly patients and in South Korea and Italy, which have an elderly population. This knowledge has produced fear and anxiety among certain groups, especially in the elderly individuals (6). In the epidemic conditions caused by the



Omicron variant, patients who are candidates for cataract surgery, which usually include the elderly, in addition to the fear of surgery, the fear of contracting COVID-19 has increased their anxiety.

Objectives

The high prevalence of COVID-19 mortality in elderly patients has caused an increase in anxiety affected by this disease among them. This study aimed to evaluate the anxiety related-COVID-19 in the Omicron variant and its related factors in elderly patients who are candidates for cataract surgery.

Patients and Methods

Study design and participants

This descriptive-analytical study was conducted on 159 elderly patients who are candidates for cataract surgery referred to the teaching hospitals of Shiraz University of Medical Sciences in 2022. In this study, in a two-month period, among 258 candidate patients for cataract surgery referred to Khalili and Dastgheib hospitals, 164 older than 65 years old patients were selected by an easy and accessible sampling method. The inclusion criteria included being over 65 years old, informed consent and being a candidate for cataract surgery. Exclusion criteria included taking anxiety-reducing drugs and having a history of mental disease.

Study method and data collection

On the patient's admission day and before entering the operating room, over 65 years old patients who were candidates for cataract surgery were enrolled in the study. Demographic characteristics sheet and the Corona Disease Anxiety Scale (CDAS) questionnaire were filled out by them. The Corona Disease Anxiety Scale questionnaire has 18 questions with four options on a Likert scale (0 to 3) and in two physical and psychological dimensions. The minimum score was 0, and the maximum score was 54. Scores less than 16 indicate no or mild anxiety, and scores over 17 indicate moderate or severe anxiety (7).

Statistical analysis

Statistical Package for Social Sciences (SPSS) software version 26 and Fisher's exact test, Mann-Whitney U, and binary logistic regression tests were conducted for data analysis. Data normality was evaluated using the Kolmogorov-Smirnov test. *P* value less than 0.05 was considered significant.

Results

Results showed that out of 159 patients, 42.1% were men with a mean age of 73.09 ± 9.64 years. Most of them had a history of COVID-19 infection, were married, vaccinated and lived in the city. Housekeeping, self-employment, unemployment, retirement and employment respectively were the most common jobs in the studied samples. Out

of 159 patients, 70.4% had mild or non-anxiety, 22.6% had moderate and 6.9% had anxiety severe (Table 1).

Data analysis by binary logistic regression demonstrated that the correlation between anxiety level with location and marital status was not significant; however, gender, vaccination status and history of infected by COVID-19 were associated. In terms of gender, women versus men significantly demonstrated higher anxiety levels. People who did not have a history of being infected by COVID-19 experienced a higher level of anxiety. Regarding vaccination, results demonstrated that the frequency of not-vaccinated patients with moderate or severe anxiety levels was significantly more than vaccinated (Table 2).

Results showed that the anxiety level difference between job categories was not significant. The mean age in patients with mild or non-anxiety was 70.89 ± 8.80 years and in the patients who had moderate or severe was 79.61 ± 8.93 years. Mann Whitney U test displayed that in the moderate or severe group, the mean age was significantly greater than those who had mild or non-anxiety (Table 3).

Discussion

Anxiety is one of the most common mental disorders, which is the body's natural response to the stressful situations and dangers that threaten human health (8). The sudden appearance of COVID-19, its unknown origin, its epidemic nature and the lack of prevention and treatment methods for it, have caused a lot of fear and anxiety for people, especially the elderly, due to its high mortality rate in elderly patients (9). This study was conducted to investigate factors affecting the anxiety related-COVID-19 of elderly patients who were candidates for cataract surgery in the Omicron variant.

Table 1. Demographic characteristics and clinical findings in the studied patients

Variables		
Gender, No. (%)	Male	67 (42.1)
	Female	92 (57.9)
Marital status, No. (%)	Single	6 (3.8)
	Married	153 (96.2)
Location, No. (%)	City	86 (54.1)
	Suburbs	73 (45.9)
History of COVID-19 infected, No. (%)	Yes	83 (52.2)
	No	76 (47.8)
Vaccination status, No. (%)	Vaccination	147 (92.5)
	Non-vaccination	12 (7.5)
	Housekeeping	69 (43.4)
	Employee	2 (1.3)
Job, No. (%)	Self-employment	39 (24.5)
	Retired	9 (5.7)
	Unemployment	40 (25.2)
Anxiety levels, No. (%)	Mild or non-anxiety	112 (70.4)
	Moderate or severe anxiety	47 (29.6)
Age (y), Mean (SD)		73.09 (9.64)

Table 2. The association between anxiety levels and variables such as gender, marital status, location, history of being infected by COVID-19, and vaccination status

Variables	Total (N = 159)	Anxiety		OR	95% CI Lower-upper	P value
		Mild or none (n= 112) No. (%)	Moderate or severe (n=47) No. (%)			
Gender						
Male	67	58 (86.8)	9 (13.4)	0.221	0.098–0.498	< 0.001*
Female	92	54 (58.7)	38 (41.3)			
Marital status						
Single	6	5 (83.3)	1 (16.7)	2.15	0.244–18.914	0.490*
Married	153	107 (69.9)	46 (30.1)			
Location						
City	86	61 (70.9)	25 (29.1)	1.011	0.632–1.616	0.964*
Suburbs	73	51 (69.9)	22 (30.1)			
COVID-19 infected history						
Yes	83	69 (83.1)	14 (16.9)	3.782	1.819–7.864	< 0.001*
No	76	43 (56.6)	33 (43.4)			
Vaccination						
Yes	147	111 (75.5)	36 (24.5)	33.917	4.232–271.85	0.001*
No	12	1 (8.3)	11 (91.7)			

OR, odds ratio; CI, confidence interval; *Binary logistic regression.

Table 3. The association between anxiety levels and variables such as age and job

Variables	Anxiety		P value	
	Mild or none	Moderate or severe		
Job, No. (%)	Housekeeping	55 (79.7)	14 (20.3)	0.129*
	Employee	1(50)	1(50)	
	Self-employment	25 (64.1)	14 (35.9)	
	Retired	7 (77.8)	2 (22.2)	
	Unemployment	24 (60)	16 (40)	
Age (y), Mean ± SD	70.89 ± 8.80	79.61 ± 8.93	< 0.001*	

* Fisher's exact test.

The results of our study demonstrated that older age, female gender, being non-vaccinated and having no history of COVID-19 infected were the most important factors that increased anxiety related-COVID-19 in elderly patients; however, job, place of residence and marital status were not related to anxiety related- COVID-19.

In the present study, the level of anxiety related-COVID-19 in women was higher than in men. In line with our study, Özdin et al reported that female gender and history of other diseases were risk factors for anxiety during the COVID-19 epidemic (10). Andrade et al stated that women are more psychologically vulnerable during the current pandemic and have more fear and also anxiety about contracting COVID-19 (11). Greater fear and anxiety related-COVID-19 in women have been observed in other studies (12). Two studies in Eastern Europe (13) and Bangladesh (14) also showed greater anxiety related-COVID-19 in women. The prevalence of mental disorders in older women is higher than in men, which can be due to hormonal differences (15). On the other hand, women can express their thoughts easier and develop mental health disorders. These cases can explain the relationship

between gender and anxiety initiated by COVID-19 in the studied elderly.

In the present study, people who had a history of being COVID-19 infected had less anxiety than others. This finding is in contrast to the results of the study by Andrade et al, who stated that people with a history of COVID-19 infected experienced a greater anxiety caused by the fear of re-infection with this disease (11). Previous infected with COVID-19 and not causing serious illness or death in them has normalized and reduced the obsession with this disease, which resulted in reduced anxiety in people.

In our study, older age was one of the factors that increased anxiety. De Leo and Trabucchi (16) and Meng et al (17), consistent with our results, stated that older people showed more fear of contracting COVID-19. In contrast to our results, Choi et al demonstrated that age was a negative predictor of anxiety related-COVID-19 such that the anxiety score was lower in older people than in younger (18). The results of a study in Brazil found that the level of anxiety-related COVID-19 decreases with age (11). In a study in Italy, the correlation between age and anxiety caused by coronavirus was not significant (19).

Previous study results on COVID-19 patients show that the mortality rate caused by this disease was associated with age and increased in the elderly significantly. Knowing about the high mortality rate of COVID-19 in elderly patients has caused older people to become obsessed with it and, as a result, initiates an increase in their fear and anxiety of death.

In the present study, no significant statistical association was found between anxiety related-COVID-19 and marital status. In contrast to our study, Li et al stated that married and divorced people experience more stress than single (20). The reason for this difference can be the differences in the living environment, roles and expectations and concerns of each group in their society.

Results indicated that the correlation between vaccination status and anxiety related-COVID-19 was significant and vaccinated people disclosed less anxiety than non-vaccinated. In line with our study, Benadu et al, demonstrated that anxiety related to COVID-19 was associated with vaccination and non-vaccinated people experienced more anxiety (21). In another study by Nguyen, a positive correlation between vaccination and COVID-19-related anxiety has been proven (22). Considering the proven vaccination effectiveness in preventing the spread of COVID-19 in previous studies and reducing the rate of infection and mortality due to it, the vaccinated people have less fear and anxiety due to the confidence they have gained about the vaccine.

Conclusion

The results showed that the correlation between anxiety related to COVID-19 in the elderly people with age, gender, vaccination status and history of being infected by COVID-19 was significant; however, the correlation with the job, place of residence and marital status were not significant. Therefore, we conclude that older age, female gender, non-vaccinated and having no history of being infected by COVID-19 are the most influential factors that increase anxiety caused by COVID-19 in elderly patients.

Limitations of the study

Individual, social, psychological and family differences were uncontrollable variables of the present study that can affect the research results.

Authors' contribution

Conceptualization: JE and GS.

Methodology: SD and MM.

Validation: YKh.

Formal analysis: RS.

Investigation: MA and MKh.

Resources: MM, NP and JE.

Data curation: JE and GS.

Writing-original draft preparation: SD, MM, NP and MA.

Writing-review and editing: MM, YKh, MKh and RS.

Visualization: YKh.

Supervision: JE.

Project administration: NP.

Conflicts of interest

The authors declare that there is no conflict of interest.

Ethical issues

The research followed the tenets of the Declaration of Helsinki. The Ethics Committee of Shiraz University of Medical Sciences approved this study (IR.SUMS.NUMIMG.REC1401.007). Accordingly, written informed consent was taken from all participants before any intervention. This study was extracted from a MSc Nursing thesis (Najmeh Parsai; Thesis#25124) at Shiraz University of Medical Sciences. Besides, ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

Funding/Support

No funding.

References

- Zhang L, Li Q, Liang Z, Li T, Liu S, Cui Q, et al. The significant immune escape of pseudotyped SARS-CoV-2 variant Omicron. *Emerg Microbes Infect.* 2022;11:1-5. doi: 10.1080/22221751.2021.2017757.
- Das S, Samanta S, Banerjee J, Pal A, Giri B, Kar SS, et al. Is Omicron the end of pandemic or start of a new innings? *Travel Med Infect Dis.* 2022;48:102332. doi: 10.1016/j.tmaid.2022.102332.
- Ren SY, Wang WB, Gao RD, Zhou AM. Omicron variant (B.1.1.529) of SARS-CoV-2: Mutation, infectivity, transmission, and vaccine resistance. *World J Clin Cases.* 2022;10:1-11. doi: 10.12998/wjcc.v10.i1.1.
- Vitiello A, Ferrara F, Auti AM, Di Domenico M, Boccellino M. Advances in the Omicron variant development. *J Intern Med.* 2022;292:81-90. doi: 10.1111/joim.13478.
- Zhang T, Wu Q, Zhang Z. Probable Pangolin Origin of SARS-CoV-2 Associated with the COVID-19 Outbreak. *Curr Biol.* 2020;30:1346-51.e2. doi: 10.1016/j.cub.2020.03.022.
- Kang SJ, Jung SI. Age-Related Morbidity and Mortality among Patients with COVID-19. *Infect Chemother.* 2020;52:154-64. doi: 10.3947/ic.2020.52.2.154.
- Çıkrıkçı Ö, Çıkrıkçı N, Griffiths M. Fear of COVID-19, stress and depression: A meta-analytic test of the mediating role of anxiety. *Psychol Psychother.* 2022;95:853-74. doi: 10.1111/papt.12406.
- Jacobi F, Wittchen HU, Höltling C, Sommer S, Lieb R, Höfler M, et al. Estimating the prevalence of mental and somatic disorders in the community: aims and methods of the German National Health Interview and Examination Survey. *Int J Methods Psychiatr Res.* 2002;11:1-18. doi: 10.1002/mpr.118.
- Qiu J, Shen B, Zhao M, Wang Z, Xie B, Xu Y. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *Gen Psychiatr.* 2020;33:e100213. doi: 10.1136/gpsych-2020-100213.
- Özdin S, Bayrak Özdin Ş. Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. *Int J Soc Psychiatry.* 2020;66:504-11. doi: 10.1177/0020764020927051.
- Andrade EF, Pereira LJ, Oliveira APL, Orlando DR, Alves DAG, Guillarducci JS, et al. Perceived fear of COVID-19 infection according to sex, age and occupational risk using the Brazilian version of the Fear of COVID-19 Scale. *Death Stud.* 2022;46:533-42. doi: 10.1080/07481187.2020.1809786.
- Tzur Bitan D, Grossman-Giron A, Bloch Y, Mayer Y, Shiffman N, Mendlovic S. Fear of COVID-19 scale: Psychometric characteristics, reliability and validity in the Israeli population. *Psychiatry Res.* 2020;289:113100. doi: 10.1016/j.

- psychres.2020.113100.
13. Reznik A, Gritsenko V, Konstantinov V, Khamenka N, Isralowitz R. COVID-19 Fear in Eastern Europe: Validation of the Fear of COVID-19 Scale. *Int J Ment Health Addict.* 2021;19:1903-8. doi: 10.1007/s11469-020-00283-3.
 14. Sakib N, Bhuiyan A, Hossain S, Al Mamun F, Hosen I, Abdullah AH, et al. Psychometric Validation of the Bangla Fear of COVID-19 Scale: Confirmatory Factor Analysis and Rasch Analysis. *Int J Ment Health Addict.* 2022;20:2623-34. doi: 10.1007/s11469-020-00289-x.
 15. Dell'Osso B, Benatti B, Rodriguez CI, Arici C, Palazzo C, Altamura AC, et al. Obsessive-compulsive disorder in the elderly: A report from the International College of Obsessive-Compulsive Spectrum Disorders (ICOCS). *Eur Psychiatry.* 2017;45:36-40. doi: 10.1016/j.eurpsy.2017.06.008.
 16. de Leo D, Trabucchi M. COVID-19 and the Fears of Italian Senior Citizens. *Int J Environ Res Public Health.* 2020;17:3572. doi: 10.3390/ijerph17103572.
 17. Meng H, Xu Y, Dai J, Zhang Y, Liu B, Yang H. Analyze the psychological impact of COVID-19 among the elderly population in China and make corresponding suggestions. *Psychiatry Res.* 2020;289:112983. doi: 10.1016/j.psychres.2020.112983.
 18. Choi E, Lee J, Lee SA. Validation of the Korean version of the obsession with COVID-19 scale and the Coronavirus anxiety scale. *Death Stud.* 2022;46:608-14. doi: 10.1080/07481187.2020.1833383.
 19. Soraci P, Ferrari A, Abbiati FA, Del Fante E, De Pace R, Urso A, et al. Validation and Psychometric Evaluation of the Italian Version of the Fear of COVID-19 Scale. *Int J Ment Health Addict.* 2022;20:1913-22. doi: 10.1007/s11469-020-00277-1.
 20. Li Z, Ge J, Yang M, Feng J, Qiao M, Jiang R, et al. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav Immun.* 2020;88:916-9. doi: 10.1016/j.bbi.2020.03.007.
 21. Bendau A, Plag J, Petzold MB, Ströhle A. COVID-19 vaccine hesitancy and related fears and anxiety. *Int Immunopharmacol.* 2021;97:107724. doi: 10.1016/j.intimp.2021.107724.
 22. Nguyen M. The Psychological Benefits of COVID-19 Vaccination. *J Adv in Public Health.* 2021;2021:1718800. doi: 10.1155/2021/1718800.