



Impact of COVID-19 Pandemic on Quality of Life in Older Adults

COVID-19 Pandemisinin Yaşlı Yetişkinlerde Yaşam Kalitesine Etkisi

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Öz

Amaç: Korona virüs (COVID-19) pandemisi sırasında sokağa çıkma yasağı nedeniyle evde karantinada kalan yaşlı yetişkinlerin yaşam kalitelerindeki değişimi araştırmak. **Yöntem:** Çalışmaya pandemi döneminde sokağa çıkma yasağı nedeniyle evinden çıkmayan 65-85 yaş aralığındaki beş yüz yirmi bir gönüllü yaşlı dahil edildi. Katılımcıların pandemi öncesi ve pandemi sırasında sağlıkla ilgili yaşam kalitelerini belirlemek için Avrupa Sağlık Etki Ölçeği-Yaşam Kalitesi (EUROHIS-QoL 8) maddelik Tr kullanıldı. Analizler yaş (Grup 1: 65-69, Grup 2: 70-74, Grup 3: 75-79, Grup 4: 80-85) ve cinsiyet gruplarına göre yapıldı. **Bulgular:** Tüm yaş gruplarında pandemi sırasında EUROHIS-QoL 8. madde Tr skorlarında pandemi öncesine göre anlamlı düşüş bulundu ($p=0,0001$). Pandemi sırasında hem kadın hem de erkek katılımcılarda EUROHIS-QoL 8. madde Tr skorlarında pandemi öncesine göre anlamlı düşüş olduğu tespit edildi ($p=0,0001$). Pandemi öncesi ve pandemi sırasında EUROHIS-QoL 8. madde Tr toplam puanlarının fark değerlerinde yaş grupları ve cinsiyet arasında anlamlı fark bulunmadı ($p>0,05$). **Sonuç:** COVID-19 pandemisi sırasında sokağa çıkma yasağı nedeniyle kendini izole etmek zorunda kalan yaşlı yetişkinlerin yaşam kalitelerinin pandemi öncesine göre olumsuz etkilendiği belirlendi.

Anahtar kelimeler: COVID-19; yaşlı; pandemi; yaşam kalitesi; karantina

Abstract

Aim: To investigate the change in quality of life of older adults who were self-isolated due to the curfew during COVID-19 pandemic. **Method:** Five hundred and twenty-one voluntary older adults aged between 65-85, who could not leave their home due to curfew during the pandemic were included in the study. Europe Health Impact Scale Quality of Life (EUROHIS-QoL) 8-item Tr was used to determine the health-related quality of life of the participants before and during the pandemic. The analyzes were done according to the age (Group 1: 65-69 years, Group 2: 70-74 years, Group 3: 75-79 years, Group 4: 80-85 years) and gender groups. **Results:** A significant decrease was found in EUROHIS-QoL 8-item Tr scores during the pandemic compared to before the pandemic in all age groups ($p=0.0001$). It was found that there was a significant decrease in EUROHIS-QoL 8-item Tr scores during the pandemic in both female and male participants compared to the pre-pandemic ($p=0.0001$). There was no found significant difference between the age groups and between the gender for the difference values of EUROHIS-QoL 8-item Tr total scores before and during the pandemic ($p>0.05$). **Conclusion:** It has been determined that the quality of life of the older adults, who had to self-isolate due to the curfew during the COVID-19 pandemic has been negatively affected according to the pre-pandemic.

Keywords: COVID-19; elderly; pandemics; quality of life; quarantine



1. Introduction

The world is currently experiencing an epidemic of an infectious disease called COVID -19. Turkey is also among the countries severely affected by the epidemic. While much of the global attention is focused on the impact of coronavirus on physical health, the impact of the quality of life of people in domestic quarantine due to coronavirus on their overall health cannot be ignored (1,2).

The new type of coronavirus significantly affects the general population, but the chronically ill and elderly are more at risk. The elderly are more susceptible to severe illness, and the mortality rate is higher in elderly patients admitted to the intensive care unit(2). One of the studies found that 15.1% of the 1099 patients with novel coronavirus pneumonia were 60 years of age or older, and 27.0% of patients with severe disease were 60 years of age or older. Another large study analyzed 4021 confirmed cases and outcomes. It showed that 1052 (26.2%) were 60 years or older. As for mortality, the mortality rate was significantly higher in patients older than 60 years (5.3%) than in patients younger than 60 years (1.4%) (2-5).

In the context of all this data and the precautions taken by governments, there are studies that show that anxiety and depression increase in geriatric individuals who have or have not had the disease. In addition, it is believed that the disease can lead to various health problems, such as moving away from people, limiting physical activity, and changing lifestyle in people over 60 years old who are not allowed to leave their homes (6,7).

A study by Hoang et al. found that depression and associated healthy quality of life was significantly affected in individuals during the global epidemic. They also emphasize the importance of such population studies and data sharing to support social health (8).

The aim of our study was to investigate the change in the quality of life of older adults who were self-isolated because of the curfew during the pandemic COVID -19. We think that the data to be obtained will contribute to the general health approach during he COVID -19 pandemic.

2. Method

2.1. Study design

A cross-sectional study was conducted from April

13, 2020, to July 10, 2020. In Turkey, 11-12 April 2020 prohibited people from the age of 65 years and older to take to the streets application was launched. These people, who must stay in their homes until June, will be allowed to go out on the streets at certain times of the day starting in June. The population of the research will be composed of elderly participants aged 65-85, literate, living in their own home, mobile and independent, living in Pamukkale, Denizli city center. Participants will be informed about the purpose of the survey to be applied over the phone and the study method, and voluntary verbal consent will be obtained stating that they have voluntarily participated in the study. Older adults who could not cooperate, who were taking psychiatric medications, and who could not leave the house before the pandemic because of important systemic problems were excluded from the study. Because of the pandemic, necessary information and study data were obtained from participants by telephone. Health-related quality of life was assessed using the EUROHIS-QoL 8-item Tr. Study participants were asked to complete the EUROHIS-QoL 8-Item Tr questionnaire twice. Participants were asked to answer the questionnaire considering their situation in the period before COVID -19, and they were asked to answer the same questionnaire considering their situation in the period COVID -19 for the second time.

This study was approved by the Noninvasive Clinical Research Ethics Committee (60116787/41146). The study was conducted in full compliance with national and international regulations and the Declaration of Helsinki. All participants were fully informed of the requirements of the study and were required to accept the data sharing and privacy policies before participating in the study.

2.2. Survey questionnaire

The questionnaires contained the following information.

The EUROHIS-QOL.8, developed according to the WHOQOL short scale and tested for validity and reliability, is used as a general health quality of life scale (9). The psychometric properties of the Turkish version of EUROHIS (WHOQOL-8. Tr) in Turkish society were determined by Eser et al (10). Both questionnaires consisted of 8 general questions. A 5-selection Likert-type questionnaire was used. There is a directly proportional



relationship between the scale score and quality of life. The scale can be scored either by averaging the questions, adding the responses, or converting these sums to 100. The first question of the scale refers to the perception of overall quality of life, and the second question refers to the perception of overall health status. Answering these two questions is mandatory for calculating the scale score. The other six questions were about energy for daily living (question 3), satisfaction with daily living skills (question 4), satisfaction with self (question 5), satisfaction with relationships with others (question 6), availability of money for needs (question 7), and housing situation (question 8). The results of the scale provide quantitative data on quality of life so that the quality of life of different groups can be compared and at-risk groups can be identified. In our study, the scale was scored using the average of the questions.

2.3. Statistical Analysis

Categorical variables are described by frequencies and percentages, and continuous variables are described by the mean, standard deviation, and interquartile range. The chi-square test was used to compare demographic data between genders. Paired-samples t-test was used for within-group comparisons of the EUROHIS-QoL 8 items tr by age group and gender. The one-way test ANOVA was used to compare the difference scores of the EUROHIS-QoL 8-Item Tr between age groups. The independent samples t-test was used to compare the difference scores of the EUROHIS-QoL 8 item Tr between genders. All statistical analyses were performed using SPSS software, version 21.0 (SPSS, Chicago, IL). $p \leq .05$ was considered statistically significant.

3. Results

A total of 600 older adults completed the questionnaire. After exclusion of ineligible data, 521 older adults aged 65 to 85 years were included in the study. The demographic variables recorded were age, sex, and scores of each question of the EUROHIS-QoL 8-Item.

education level (Table 1). Comparative analyzes were performed by dividing them by age groups (group 1: 65-69 years, $n=253$; group 2: 70-74 years, $n=135$; group 3: 75-79 years, $n=66$; group 4: 80-85 years, $n=67$) and sexes (female, $n=271$; male, $n=250$).

There was no statistical difference between the mean age of female and male older adults ($p > 0.05$) (71.32 ± 5.54 years and 71.18 ± 5.40 years, respectively). It was found that 12.7% of male older adults had an education level higher than 8 years, while most (29.2%) of female older adults had an education level lower than 8 years ($p < 0.05$) (Table 1).

Table 1. Demographic characteristics of the participants

	Whole sample ($n=521$)	Females ($n=271$)	Males ($n=250$)	p Value*
	Mean \pm SD	Mean \pm SD	Mean \pm SD	
Age(years)	71.26 ± 5.47	71.32 ± 5.54	71.18 ± 5.40	NS
	n(%)	n(%)	n(%)	
Age groups				
65-70	286(54.9)	145(27.8)	141(27.1)	
71-75	118(22.6)	68(13.1)	50(9.6)	
76-80	68(13.1)	34(6.5)	34(6.5)	
81-85	49(9.4)	24(4.6)	25(4.8)	NS
Education level				
Illiterate	115(22.1)	95(18.3)	20(3.8)	
≤ 8 years	316(60.6)	152(29.2)	164(31.4)	
> 8 years	90(17.3)	24(4.6)	66(12.7)	0.0001

NS: Non-significant; SD: Standard Deviation; *: Chi-Square test

All participants were found to have lower EUROHIS-QoL 8-Item Tr quality of life total scores during the pandemic than pre-pandemic scores ($p=0.0001$), which was the same for all age groups ($p=0.0001$, Table 2). When participants were examined by gender, EUROHIS-QoL 8-Item Tr total scores were found to decrease during the pandemic in both genders compared to pre-pandemic totals ($p=0.0001$, Table 3).

**Table 2.** Within-group comparison of EUROHIS-QoL 8 total scores by age groups pre and during the pandemic

Group	Pre	During	95% CI		t	p Value*
	Mean ± SD	Mean ± SD	Lower	Upper		
All	3.49±0.64	2.97±0.65	0.478	0.558	25.632	0.0001
1	3.62±0.61	3.03±0.62	0.537	0.654	19.983	0.0001
2	3.41±0.59	2.94±0.60	0.406	0.543	13.684	0.0001
3	3.41±0.69	2.97±0.70	0.327	0.552	7.813	0.0001
4	3.22±0.71	2.83±0.79	0.274	0.511	6.614	0.0001

*: Paired samples t test; X: Mean; SD: Standard Deviation; CL: Confidence Interval of the difference; 1: 65-69 years; 2: 70-74 years; 3: 75-79 years; 4: 80-85 years.

When the difference values (delta value) of the scores obtained from the EUROHIS-QoL 8-Item Tr were examined to see the impact of the pandemic on the quality of life of the participants, it was found that the difference between the delta values of the scores of each question between the age groups was not statistically significant ($p > 0.05$, Table 4). No significant difference was found in the Tr between the difference scores of male and female

participants ($p > 0.05$), except for the fourth question ($p=0.0001$). The decrease in difference scores for the 4th question, which related to "satisfaction with their performance in activities of daily living," was smaller for female participants than for male participants ($p=0.0001$, Table 5).

Table 3. Within-group comparison of EUROHIS-QoL 8 total scores by gender pre and during the pandemic

Variables	Pre	During	95% CI		t	p Value*
	Mean ± SD	Mean ± SD	Lower	Upper		
Female	3.38 ± 0.65	2.89 ± 0.67	0.429	0.536	17.716	0.0001
Male	3.60 ± 0.62	3.05 ± 0.61	0.496	0.614	18.607	0.0001

*: Paired samples t test; SD: Standard Deviation; CL: Confidence Interval of the difference



Table 4. Comparison of the difference values between the EUROHIS-QoL 8 items total scores pre and during the pandemic by age groups.

Question	Group	$\Delta \pm SD$	95% CI		F	p Value*
			Lower	Upper		
Q1	1	0.90 \pm 0.87	0.800	1.018	1.667	0.173
	2	0.74 \pm 0.89	0.595	0.900		
	3	0.71 \pm 0.95	0.476	0.947		
	4	0.94 \pm 0.95	0.708	1.172		
Q2	1	0.41 \pm 0.70	0.331	0.506	0.891	0.446
	2	0.31 \pm 0.64	0.202	0.420		
	3	0.45 \pm 0.80	0.256	0.653		
	4	0.37 \pm 0.75	0.188	0.557		
Q3	1	0.34 \pm 0.67	0.260	0.427	0.916	0.433
	2	0.39 \pm 0.65	0.280	0.504		
	3	0.43 \pm 0.58	0.295	0.583		
	4	0.26 \pm 0.64	0.112	0.425		
Q4	1	0.54 \pm 0.85	0.435	0.647	1.735	0.159
	2	0.36 \pm 0.85	0.218	0.508		
	3	0.50 \pm 0.80	0.301	0.698		
	4	0.61 \pm 0.90	0.391	0.832		
Q5	1	0.45 \pm 0.88	0.342	0.562	1.418	0.237
	2	0.36 \pm 0.83	0.221	0.504		
	3	0.42 \pm 0.82	0.221	0.626		
	4	0.62 \pm 0.84	0.419	0.834		
Q6	1	0.97 \pm 1.11	0.833	1.111	0.450	0.718
	2	1.10 \pm 1.22	0.894	1.314		
	3	1.04 \pm 1.07	0.781	1.309		
	4	1.08 \pm 1.29	0.772	1.406		
Q7	1	0.18 \pm 0.55	0.113	0.250	0.236	0.871
	2	0.17 \pm 0.46	0.091	0.249		
	3	0.15 \pm 0.47	0.035	0.363		
	4	0.22 \pm 0.57	0.084	0.225		
Q8	1	0.39 \pm 0.75	0.301	0.439	2.164	0.091
	2	0.34 \pm 0.73	0.215	0.465		
	3	0.62 \pm 0.92	0.394	0.848		
	4	0.35 \pm 0.68	0.190	0.526		
Total	1	0.52 \pm 0.47	0.046	0.469	0.040	0.746
	2	0.48 \pm 0.47	0.040	0.402		
	3	0.51 \pm 0.44	0.054	0.409		
	4	0.55 \pm 0.42	0.052	0.446		

Q: Question, Q1: How would you rate your quality of life?, Q2: How satisfied are you with your health?, Q3: Do you have enough energy for everyday life?, Q4: How satisfied are you with your ability to perform your daily living activities?, Q5: How satisfied are you with yourself?, Q6: How satisfied are you with your personal relationships?, Q7: Have you enough money to meet your needs?, Q8: How satisfied are you with the conditions of your living place?, *: One-Way ANOVA.



Table 5. Comparison of the difference values between the EUROHIS-QoL 8 items and total scores pre and during the pandemic by gender

Question	Female	Male	t	p Value*
	$\Delta \pm SD$	$\Delta \pm SD$		
Q1	0.78 \pm 0.86	0.91 \pm 0.94	1.688	0.092
Q2	0.42 \pm 0.70	0.35 \pm 0.71	-1.039	0.299
Q3	0.31 \pm 0.63	0.40 \pm 0.67	1.642	0.101
Q4	0.37 \pm 0.75	0.63 \pm 0.93	3.541	0.0001
Q5	0.46 \pm 0.89	0.43 \pm 0.82	-0.363	0.717
Q6	1.05 \pm 1.17	1.00 \pm 1.15	-0.505	0.614
Q7	0.18 \pm 0.54	0.18 \pm 0.50	-0.018	0.986
Q8	0.39 \pm 0.76	0.41 \pm 0.77	0.200	0.842
Total score	0.48 \pm 0.44	0.55 \pm 0.47	1.791	0.074

Q: Question, Q1: How would you rate your quality of life? Q2: How satisfied are you with your health? Q3: Do you have enough energy for everyday life? Q4: How satisfied are you with your ability to perform your daily living activities? Q5: How satisfied are you with yourself?, Q6: How satisfied are you with your personal relationships?, Q7: Have you enough money to meet your needs?, Q8: How satisfied are you with the conditions of your living place?, *: Independence sample t test.

4. Discussion

The novel coronavirus disease (COVID -19) has led to nationwide lockdowns in many countries, with the entire population having to isolate at home (11). In addition to the curfews, quarantines, travel restrictions or bans, closure of schools, colleges and universities, some other strategic measures have been taken in Turkey, as well as in some other countries, such as: B. stay-at-home, social distancing and personal protection warnings (12). Some strategic choices have been made to help older people store and meet their immediate needs, with the aim of maintaining well-being, healthcare and social contact, which remain very important for older people (13). Despite all these strategic choices, it seems important to understand how these can affect the well-being and quality of life of older people who have had to isolate at home. The main objective of this study was to assess the quality of life of older people, which could be associated with well-being during home isolation due to the COVID -19 pandemic. The results showed that the quality of life of all elderly participants was negatively impacted during home isolation due to the COVID -19 pandemic, even if they were female, male, or of different ages. These key findings suggest that, despite any strategic decisions, these findings could be considered by authorities when developing guidelines and/or intervention programs that could improve the well-being and quality of life of older people during self-isolation during the pandemic.

Global health authorities such as the World Health Organization (WHO) and the Center for Disease Control and Prevention (CDC) strongly advise social distancing and reduced contact with older adults ≥ 65 years (13,14). In addition to quarantining patients with COVID -19, for the implementation of social distancing as a measure to contain the spread of infection billions of people isolated in their own homes as nations have locked down. Unfortunately, with social isolation and increasing numbers of cases, the pandemic has had significant social, economic, and psychological impacts. When these isolations and quarantines persist, they lead to chronic loneliness and boredom, which adversely affect physical and mental well-being and quality of life¹⁴. In this study, all questions of the EUROHIS-QoL 8 were analyzed between age groups to determine why and at what point quality of life was affected. It was found that there was no difference between groups for any of the questions. It was found that the quality of life of all age groups was impaired to the same extent in almost all areas. All of the elderly who were isolated during the pandemic period were dissatisfied with their health, their ability to carry out their daily activities their personal relationships, and the conditions of their residence. They also reported not having enough energy for daily living and not enough money to meet their needs. As a result, the total score of the EUROHIS-QoL 8 was found to have decreased



dramatically during the pandemic compared to the pre-pandemic period. The results of this study were evidence of the freezing and stressful effect of isolation and loneliness, as well as staying at home without physical activity, on the quality of life of older people during the pandemic period. Loneliness in the elderly is known to be an independent risk factor for sensory loss, connective tissue and autoimmune diseases, cardiovascular disease, and obesity. Loneliness also decreases physical activity, leading to increased risk of frailty and bone fractures (14). In addition to all these factors, they were a combination of variants of decreased quality of life.

Although the virus is considered a global public health problem, certain populations, such as the elderly, are at clearly defined and increased risk. They are vulnerable to the long-term physical and psychological consequences of the pandemic, especially if it is chronic and associated with a lack of physical activity (15,16). This is because social isolation has been associated with physical and cognitive conditions such as heart disease, hypertension, anxiety, depression, Alzheimer's disease, and a weakened immune system (13). The existing literature highlighted that women, younger (e.g., under 25 years of age) or older (e.g., over 65 years of age) people living alone, low socioeconomic status and low education or income levels, and poor mental and physical health are the risks for loneliness both before and during the pandemic. It was found that the quality of life scores of both male and female participants during the pandemic was lower than the pre-pandemic EUROHIS-QoL 8 total scores. Interestingly, it was also found that the quality of life scores of males in this study was as impaired as those of female participants. Meanwhile, female participants' scores on each question did not differ from those of male participants, except for the fourth question, which asked about satisfaction with their ability to perform their activities of daily living. Participants' quality of life scores were not compared by educational level or socioeconomic status. Future studies could be encouraged to analyze the impact of the pandemic on quality of life with other sociodemographic characteristics and with the presence of chronic diseases and mental/physical and emotional problems. Longitudinal studies that survey levels of physical activity and data from different countries could help to better frame the quality of life of older people in

the post-pandemic period.

Encouraging older people to be physically active at home may be the cheapest, simplest, and most effective way to combat the negative effects of the COVID -19 pandemic on the physical, mental, and spiritual health of older people. (11,15,16) There is a vicious cycle between loneliness, inactivity, depression, and decreased quality of life. The results of this study can help us learn about quality of life from the perspective of elders and provide wisdom for better pandemic follow-up. The study concluded that additional care and support are needed to promote the general well-being, health care, and social contact of the elderly and to improve their quality of life through healthy aging as much of the world is isolated during the pandemic COVID-19.

Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors declared that this study received no financial support.

References

- 1- World Health Organization (WHO). Statement on the Second Meeting of the International Health Regulations (2005) Emergency Committee Regarding the Outbreak of Novel Coronavirus (2019-nCoV); WHO: Geneva, Switzerland; Available online: [https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov)) (accessed on 30 January 2020).
- 2- Liu, K., Chen, Y., Lin, R., & Han, K. Clinical features of COVID-19 in elderly patients: A comparison with young and middle-aged patients. *J Infect.* 2020; 80(6):e14-e18. doi: 10.1016/j.jinf.2020.03.005.
- 3- Li, J. Y., You, Z., Wang, Q., Zhou, Z. J., Qiu, Y., Luo, R., & Ge, X. Y. The epidemic of 2019-novel-coronavirus (2019-nCoV) pneumonia and insights for emerging infectious diseases in the future. *Microbes and infection*, 2020;22(2): 80-85.
- 4- Guan, W. J., Ni, Z. Y., Hu, Y., *et al.* (2020). Clinical characteristics of 2019 novel coronavirus infection in China. *N Engl J Med.* 2020;382;18:1708-1720.
- 5- Yang, Y., Lu, Q., Liu, M., *et al.* Epidemiological and clinical features of the 2019 novel coronavirus outbreak in China. *MedRxiv.* 2020; <https://doi.org/10.1101/2020.02.10.20021675>.
- 6- Satici, B., Gocet-Tekin, E., Deniz, M. E., & Satici, S. A. (2020). Adaptation of the Fear of COVID-19 Scale: Its association with psychological distress and life satisfaction in Turkey. *International Journal of Mental Health and Addiction*, 2020; <https://doi.org/10.1007/s11469-020-00294-01>.



- 7- Jiménez-Pavón, D., Carbonell-Baeza, A., & Lavie, C. J. Physical exercise as therapy to fight against the mental and physical consequences of COVID-19 quarantine: Special focus in older people. *Prog Cardiovasc Dis.* 2020;63(3):386-388. doi: 10.1016/j.pcad.2020.03.009.
- 8- Nguyen, H. C., Nguyen, M. H., Do, B. N., Tran, C. Q., Nguyen, T. T., Pham, K. M., & Duong, T. H. People with suspected COVID-19 symptoms were more likely depressed and had lower health-related quality of life: The potential benefit of health literacy. *Journal of clinical medicine*, 2020; 9(4): 965.
- 9- Schmidt S, Muhlan H, Power M. The EUROHIS-QOL 8-item index: psychometric results of a cross-cultural field study. *Eur. J. Public Health*, 2006; 16(4):420-428.
- 10- Eser E, Lagarlı T, Baydur H, et al. EUROHIS (WHOQOL-8.Tr) Türkçe sürümünün Türk toplumundaki psikometrik özellikleri. *Türkiye Halk Sağlığı Dergisi*, 2010;8(3): 136-152.
- 11- Carriedo A, Cecchini J.A, Fernandez-Rio J, Mendez-Gimenez A. COVID-19, Psychological Well-being and Physical Activity Levels in Older Adults During the Nationwide Lockdown in Spain. *Am J Geriatr Psychiatry*, 2020; <https://doi.org/10.1016/j.jagp.2020.08.007>
- 12- Ahsan M. Strategic decisions on urban built environment to pandemics in Turkey: Lessons from COVID-19. *Journal of Urban Management*, 2020; 9(3): 281-285. <https://doi.org/10.1016/j.jum.2020.07.001>
- 13- Banskota S, Healy M, Goldberg E.M. 15 Smartphone Apps for Older Adults to Use While in Isolation During the COVID-19 Pandemic. *Western Journal of Emergency Medicine*, 2020;21(3): 514-525.
- 14- Banerjee D, Rai M. Social isolation in Covid-19: The impact of loneliness. *International Journal of Social Psychiatry*, 2020; 66(6): 525–527.
- 15- Bu F, Steptoe A, Fancourt D. Who is lonely in lockdown? Cross-cohort analyses of predictors of loneliness before and during the COVID-19 pandemic. *Public Health*, 2020; 186: 31-34. <https://doi.org/10.1016/j.puhe.2020.06.036>
- 16- Banerjee D. 'Age and ageism in COVID-19': Elderly mental health-care vulnerabilities and needs. *Asian Journal of Psychiatry*, 2020;51: 102154. <https://doi.org/10.1016/j.ajp.2020.102154>