



Longitudinal Study Examining the Mental Health of Individuals during the Corona Virus Epidemic

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ABSTRACT

With the spread of the Corona virus worldwide, concerns about the consequences of the virus on the physical and mental health of individuals have increased widely. In addition to the problems that poses to individuals and society in terms of physical health, the virus can also have a direct or indirect effect on people's mental health. The present study was conducted to investigate the effects of this virus on the mental health of individuals during the corona virus epidemic. In this study, 550 individuals were evaluated using mental health assessment tools at different time points to investigate the effect of time in epidemic conditions on mental health.

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1. Introduction

Covid 19 is a newly discovered viral infectious disease that originates from the corona virus family. People with the disease experience mild to moderate respiratory symptoms and most people with the virus recover without special treatment. Older people with significant medical problems experience the disease more seriously (World Health Organization, 2020). The international community has been infected with the virus since December 2019. In a short period of time the disease has affected large populations around the world (as of August 10, 2020 the number of people infected with the virus is 20,083,655); which it has caused economic problems and mental health for different people, whether people with this disease or people who have not been infected with this disease, as well as the world's community therapy. Many efforts have been made to control and treat this disease. However, little attention has been paid to the negative effects of this virus on the mental health of individuals or ways to reduce the negative effects of this epidemic and improve mental health (Zhang, Zhang, Ma, 2020). According to the World Health Organization, Quid 19 can be associated with a wide range of problems. For example, symptoms related to anxiety and depression is a common reaction in people with Covid disease (World Health Organization, 2020).

The epidemic has affected many aspects of societies including health, physical and psychological health (Holmes et al. 2020). This epidemic has had different consequences. One of these consequences is its impact on the mental health of individuals (Banks and Xu, 2020) which is increasing day-by-day (Pierce et al., 2020). The virus and its epidemic in the world as an increase in anxiety levels have a direct impact on

mental health in communities (World Health Organization, 2020).

The outbreak of the virus in China has caused and raised the level of mental health concerns (Torales, O'Higgins, Castaldelli-Maia and Ventriglio, 2020). Physical illnesses, especially those with high pandemics, can affect people's quality of life as well as mental health as a stressor factor. Preliminary reports from the World Health Organization indicate that the spread of this disease has increased the level of anxiety and depression in various communities (World Health Organization 3 2020). These effects are especially reported in people who had mental disorders before the outbreak of the virus (Moreno et al., 2020). It can also cause a variety of psychological disorders (Cullen, Gulati and Kelly, 2020). Research has also been done on the effects of the corona virus on mental health. Of course, even if the impact of this epidemic on mental health has not been studied and measured, the same information can be obtained based on previous experiences with the Covid 19 virus (Torales, O'Higgins, Castaldelli-Maia and Ventriglio, 2020).

According to research, corona virus can affect people's mental health (Solomou and Constantinidou, 2020) and this virus can cause depression and anxiety in people (Nie et al., 2020). Psychological distress increased worldwide with the outbreak of the disease (Jerominus, 2020). Also, mental health concerns about people suffering from an infectious disease caused by the virus have not been adequately addressed (Lee, 2020). Most studies on the relationship between mental health and corona virus disease have been sectional.

Longitudinal studies in psychological research make it possible for researchers to assess changes in participants

'performance and behavior or individuals' status over different periods of time (Drew, 2010). Longitudinal studies examine behavioral changes and health-related processes over time (Holmbeck, Franks Bruno and Jandasek, 2006).

The sectional nature of a study means that time is not taken into account during the research. The sectional study does not provide any information about the effect of time on variables (Caruana, Roman, Hernández-Sánchez and Solli, 2015). People may be in a different mental health than they were at the time of the virus outbreak. Of course, we can say that the prevalence and mortality of this virus can be effective on the results when assessing mental health. For example, it is possible that the study was conducted at a time when mortality was at its lowest level or vice versa. Also, the possibility of different levels of health care at different times while dealing with the disease is one of the reasons for the need of research that shows the changes in the individual at different times of the disease. Sectional research on Covid 19 fails to provide this information because it was at a specific time point. For example, one of these studies was conducted on March 11-13, in which the mortality rate was (1... person) and the prevalence of the disease was (3... people), in contrast to the date of which is mostly the rate of mortality and prevalence of this disease until the time of writing this article is very different and this significant difference in the number of cases and mortality can affect the results of related researches.

However, few longitudinal studies of the virus have been performed, and only a study of the longitudinal relationship between mental health and corona virus outbreaks has shown that stress, anxiety, and depression levels have no significant changes over time. However, this study had the limitation that it could not have the same poll community during the two periods of the study (Wang et al., 2020). Therefore, considering that no long-term study has been conducted on the mental health of people involved in the corona virus epidemic, this study tried to answer the ambiguities formed in this case as much as possible.

2. Materials and Experimental Methods

2.1. Study Design and Study Population

This research was conducted in four stages in the period from March 1 to August 1, 2020. In this study, random sampling method was used. The population participating in this study included ordinary people in the community.

2.2. Procedure

This research was conducted in several stages; However, an online questionnaire was used to minimize the physical connection to create safety among the participants and to reduce the possibility of transmitting the virus. Before evaluating people, a brief explanation of this research was mentioned before sending the questionnaire and people were asked to help us in this research by answering this questionnaire with commitment. All participants in this study expressed their informed consent to participate in this study.

2.3. Outcomes

In this study, a corona virus screening tool was used to assess a person's corona virus status. This tool screens people with questions about their relationship with people who have a history of corona disease, as well as questions about the symptoms of the disease, such as fever, cough, severe headache, etc. The questions in this tool are categorized based on the answer yes or no.

The Mental health inventory tool (Veit and Ware, 1983) was also used to assess individuals' mental health. This list is

a 38-item self-reporting tool. The validity of this tool was reviewed and approved by Veit and Ware in 1983.

2.4. Statistical Analysis

For statistical analysis of the results of this study, mixed-effects regression models were used. This statistical method is widely used for longitudinal studies. This statistical method is also one of the most common methods in the study of longitudinal studies (Hedeker and Gibbons, 2006). R software was used to analyze the data of this study.

3. Results and Discussion

The aim of this study was to investigate the effect of four different time stages on the mental health of individuals during the corona virus epidemic. The number of participants in this study was 550 people; of these, 278 were women and 272 were men. The age of people was in the range of 20 to 60 years. The average age of the participants in this study was 37.02. This study was a longitudinal study. During this study, all 550 people were tested in four time stages and each time their mental health index was assessed based on a mental health questionnaire. The Mental health inventory included a questionnaire consisting of 38 questions, each with 6 answers. The mean and standard deviation of all participants in this test can be seen in the table below. Table 1 shows the mean and standard deviation of individuals' responses to the questionnaire.

Table1. Summary information about mental health.

Factor Grouping	Mean	SD
Question1	4.45	1.42
Question2	4.00	1.16
Question3	4.0	1.45
Question4	4.25	0.72
Question5	4.55	0.55
Question6	4.35	0.67
Question7	5.20	0.98
Question8	4.25	1.30
Question9	5.20	0.98
Question10	4.45	1.42
Question11	4.75	1.01
Question12	5.25	0.72
Question13	4.50	1.45
Question14	4.45	1.42
Question15	4.0	1.16
Question16	4.60	1.51
Question17	5.0	0.58
Question18	4.90	0.52
Question19	5.0	0.69
Question20	3.95	1.13
Question21	4.25	0.43
Question22	4.0	1.45
Question23	5.10	1.1
Question24	4.70	0.75
Question25	4.65	1.30
Question26	4.45	0.61
Question27	5.45	0.78
Question28	5.55	0.78
Question29	3.75	0.84
Question30	5.0	1.1
Question31	4.20	0.75
Question32	4.15	1.36
Question33	4.35	1.19
Question34	4.05	0.49
Question35	5.20	1.51
Question36	5.30	1.39
Question37	4.35	0.90
Question38	5.30	1.22

In addition, the average of the total answers given to this tool was 4.6. After a complete review of all the answers to the questions, in order to evaluate the effect of time during of this epidemic on the mental health of individuals, another test that was able to examine this issue was used.

Since the above study is longitudinal, so the best and most accurate method to investigate the effect of time on the health and mental health of people in four different time stages is to use linear mixed effect model. In these models, in addition to fixed effects, random effects are also considered in the model. Before analysis, the model assumptions were reviewed and confirmed, and also the normality test was used to check the normality. The normality of the research data was ensured.

Table 2 shows the results for the linear mixed effect model. Based on the value of time (p -value<0.0001), we find that time has become significant, in other words, during this epidemic, time has had a significant impact on the mental health of patients.

Table2. Fixed effect table.

parameter	Value	Std.error	t-value	P-value
Intercept	6.125	0.438	13.96	<0.0001
Time	-0.875	0.088	-9.93	<0.0001

Table3. Analysis of Variance (ANOVA) table.

parameter	DF	Sum of square	Mean square	F-value	P-value
Time	1	20.13	20	98.70	<0.0001

In addition, based on the results of ANOVA in Table 3, we conclude that time has had a significant effect on the mental health of people; in other words, the mental health of people has been different at different times. Moreover, people's mental health has changed due to time changes.

Various factors over time and during this epidemic can affect the mental health of individuals and their mental health undergoes changes, including the following:

Social isolation due to social distance can exacerbate fear, anxiety, loneliness, and depression. Social isolation, if it lasts for a long time, can cause psychological distress and thus endanger the mental health of individuals (CarvalhoAguiarMelo, and de Sousa Soares, 2020). Therefore, it can be said that the more extreme the social distance in individuals, the more social isolation it can cause and, as a result, the more mental health of individuals can be endangered.

On the other hand, studies have shown that one of the factors that affected people during the epidemic of this disease in the world was the economic problems caused by this epidemic. Economic problems can be one of the factors affecting people's mental health (Mucci, Giorgi, Roncaioli, Perez and Arcangeli, 2016; Stuckler, Basu, Suhrcke, Coutts and McKee, 2009).

4. Conclusion

Prolonged stress during life can have cumulative and increasing effects on a person's health (with increasing stress, health is more endangered). In addition, the severity and extent of exposure to stressors can affect mental health directly (Toussaint, Shields, Dorn and Slavich, 2016). Therefore, it can be said that one of the reasons for the difference between people's mental health over time and the decrease in the mental health of society during the epidemic is the continuous exposure of people to stress. The longer people are exposed to stress, the more endangered their mental health becomes.

Another factor that can be considered as an effective factor in people's mental health is negative life events. During the corona virus epidemic, the lives of people in communities have been associated with many negative events; they lived with the news of deaths and traumatic events. These negative events can affect people's mental health. According to research by Spinhoven et al., 2011 negative life events can affect the level of anxiety and depression in people and pose a threat to mental health.

Research has also shown that mortality in a community has had an impact on people's mental health (Markush, Schwab, Farris, Present and Holzer, 1977). Accordingly, it can be said that because at different times during this epidemic, the incidence and mortality of people with the disease has undergone various changes, one of the factors explaining the fluctuations in mental health of people throughout the disease, was the deaths of people in that society.

Various studies on various diseases have shown that lack of knowledge about a disease causes anxiety in people (Meisenhelder, 1994; Kaplan and Van Den Worm, 1993). Proper knowledge of a disease can lead to better and more appropriate psychological functioning (Wang, Hay, Clarke and Menahem, 2014). At the beginning of the epidemic due to the contradictory and purely observational (experimental) information that existed about this disease there was no correct knowledge about this disease and the type of transmission for individuals in communities. This can cause psychological dysfunction and consequently create and increase psychological anxiety and distress and endanger mental health among individuals. In addition, the more time has passed since the outbreak of this disease in different countries of the world, with more research and sharing more and more complete information about this disease and creating a clearer view for people, a factor to reduce anxiety caused by lack of awareness appeared in communities.

In the end, it seems that another factor that has been able to affect the mental health of people in this period is the good news about Covid 19 vaccine therapy. This good news about vaccines and treatment of this disease can cause hope in people and as a result, improve the mental health of people in the society.

References

- Question and answers hub.* (n.d.). WHO | World Health Organization.<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub>.
- Coronavirus disease - Answers.* (n.d.). WHO | World Health Organization.<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/coronavirus-disease-answers?query=mental+health+impact>
- Substantial investment needed to avert mental health crisis.* (2020, May 14). WHO | World Health Organization. <https://www.who.int/news-room/detail/14-05-2020-substantial-investment-needed-to-avert-mental-health-crisis>.
- Banks, J., & Xu, X. (2020). The mental health effects of the first two months of lockdown and social distancing during the Covid-19 pandemic in the UK. *London: Institute for Fiscal Studies.*
- Caruana, E. J., Roman, M., Hernández-Sánchez, J., & Solli, P. (2015). Longitudinal studies. *Journal of thoracic disease*, 7(11), E537.
- Carvalho Aguiar Melo, M., & de Sousa Soares, D. (2020). Impact of social distancing on mental health during the

- COVID-19 pandemic: An urgent discussion. *International Journal of Social Psychiatry*, 0020764020927047.
- Cullen, W., Gulati, G., & Kelly, B. D. (2020). Mental health in the Covid-19 pandemic. *QJM: An International Journal of Medicine*, 113(5), 311-312.
- Drew, C. J. (2010). Longitudinal Studies. *The Corsini Encyclopedia of Psychology*, 1-1.
- Hedeker, D., & Gibbons, R. D. (2006). *Longitudinal data analysis* (Vol. 451). John Wiley & Sons.
- Holmbeck, G. N., Franks Bruno, E., & Jandasek, B. (2006). Longitudinal research in pediatric psychology: An introduction to the special issue. *Journal of Pediatric Psychology*, 31(10), 995-1001.
- Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., ... & Ford, T. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*.
- Jerominus, B. F. (2020). Personality and Coronavirus 2019 Pandemic.
- Kaplan, M. E., & Van Den Worm, Y. (1993). The relationship between South African adolescents' knowledge and fear of AIDS and their attitudes toward people who have AIDS. *The Journal of social psychology*, 133(4), 581-583.
- Lee, S. A. (2020). Coronavirus Anxiety Scale: A brief mental health screener for COVID-19 related anxiety. *Death studies*, 44(7), 393-401.
- Markush, R. E., Schwab, J. J., Farris, P., Present, P. A., & Holzer, C. E. (1977). Mortality and community mental health: The Alachua County, Florida, mortality study. *Archives of General Psychiatry*, 34(12), 1393-1401.
- Meisenhelder, J. B. (1994). Contributing factors to fear of HIV contagion in registered nurses. *Image: the Journal of Nursing Scholarship*, 26(1), 65-69.
- Mental health and COVID-19*. (2020, June 3). WHO/Europe. <https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/technical-guidance/mental-health-and-covid-19>.
- Moreno, C., Wykes, T., Galderisi, S., Nordentoft, M., Crossley, N., Jones, N., ... & Chen, E. Y. (2020). How mental health care should change as a consequence of the COVID-19 pandemic. *The Lancet Psychiatry*.
- Mucci, N., Giorgi, G., Roncaioli, M., Perez, J. F., & Arcangeli, G. (2016). The correlation between stress and economic crisis: a systematic review. *Neuropsychiatric disease and treatment*, 12, 983.
- Nie, X. D., Wang, Q., Wang, M. N., Zhao, S., Liu, L., Zhu, Y. L., & Chen, H. (2020). Anxiety and depression and its correlates in patients with coronavirus disease 2019 in Wuhan. *International Journal of Psychiatry in Clinical Practice*, 1-6.
- Pierce, M., Hope, H., Ford, T., Hatch, S., Hotopf, M., John, A., ... & Abel, K. M. (2020). Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population. *The Lancet Psychiatry*.
- Solomou, I., & Constantinidou, F. (2020). Prevalence and Predictors of Anxiety and Depression Symptoms during the COVID-19 Pandemic and Compliance with Precautionary Measures: Age and Sex Matter. *International Journal of Environmental Research and Public Health*, 17(14), 4924.
- Spinoven, P., Elzinga, B. M., Hovens, J. G. F. M., Roelofs, K., Van Oppen, P., Zitman, F. G., & Penninx, B. W. J. H. (2011). Positive and negative life events and personality traits in predicting course of depression and anxiety. *Acta Psychiatrica Scandinavica*, 124(6), 462-473.
- Stuckler, D., Basu, S., Suhrcke, M., Coutts, A., & McKee, M. (2009). The public health effect of economic crises and alternative policy responses in Europe: an empirical analysis. *The Lancet*, 374(9686), 315-323.
- Torales, J., O'Higgins, M., Castaldelli-Maia, J.M., & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *International Journal of Social Psychiatry*, 0020764020915212.
- Toussaint, L., Shields, G. S., Dorn, G., & Slavich, G. M. (2016). Effects of lifetime stress exposure on mental and physical health in young adulthood: How stress degrades and forgiveness protects health. *Journal of health psychology*, 21(6), 1004-1014.
- Veit, C., & Ware, J. (1983). The structure of psychological distress and well-being in general populations. *Journal of Counseling and Clinical Psychology*, 51(5), 730-742.
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R. S., ... & Ho, C. (2020). A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain, behavior, and immunity*.
- Wang, Q., Hay, M., Clarke, D., & Menahem, S. (2014). Associations between knowledge of disease, depression and anxiety, social support, sense of coherence and optimism with health-related quality of life in an ambulatory sample of adolescents with heart disease. *Cardiology in the Young*, 24(1), 126.
- Zhang, Y., Zhang, H., Ma, X., & Di, Q. (2020). Mental Health Problems during the COVID-19 Pandemics and the Mitigation Effects of Exercise: A Longitudinal Study of College Students in China. *International Journal of Environmental Research and Public Health*, 17(10), 3722.