Original Article

Relationship of Quarantine Caused by Coronavirus with Sleep Quality, Irritability, and Self-esteem of Primary School Students in District one of Karaj, Iran

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Abstract

Background and Objective: Since mental health problems in children can not only have individual complications and costs but can also affect the family and society, this study aimed to investigate the relationship of quarantine caused by coronavirus with sleep quality, irritability, and self-esteem of primary school students in District one of Karaj, Iran.

Materials and Methods: The statistical population of this correlational study included all primary school students in District one of Karaj, Iran, who were studying in the second semester of the academic year 2019-20. The total number of students in the first semester of 2019-20 was 4860 cases, and the statistical sample size based on Cochran's formula was estimated at 377 individuals from six schools selected by multi-stage cluster random sampling. The data were collected using Coronavirus Quarantine Questionnaire, Pittsburgh Sleep Quality Questionnaire, Irritability Questionnaire, and Self-Esteem Questionnaire. The obtained results were then analyzed using descriptive statistics (frequency distribution tables, bar graphs, center orientation indices [e.g., mean], and dispersion indices [e.g., minimum, maximum, and standard deviation]).

Results: According to the results of the Pearson correlation coefficient, a positive and significant relationship was observed between quarantine and total self-esteem (0.39) (P<0.01). Therefore, it can be said that the longer quarantine time of individuals leads to a higher level of their total self-esteem. In addition, there was a positive and significant relationship between quarantine and all components of self-esteem, except for academic (educational) self-esteem (P<0.05). Accordingly, a longer time of quarantine in the students results in higher educational self-esteem levels. Among the components of self-esteem, quarantine revealed the strongest and weakest relationships with family self-esteem and academic self-esteem (educational) (P<0.01), respectively.

Conclusions: The results showed the relationship of quarantine caused by Coronavirus with sleep quality, irritability, and self-esteem of primary school students in District one of Karaj, Iran.

Keywords: Coronavirus, Irritability, Quarantine, Self-esteem, Sleep quality

Background

In December 2019, the release of a viral disease was reported in Wuhan, China. The cause of this disease was a new and genetically modified virus from the family of coronaviruses called coronavirus disease-2019 (COVID-19) [1]. Unfortunately, due to its very high transmission rate, the virus spread rapidly throughout the world and infected almost all countries of the world in a short time (less than four months) [2,3]. According to official reports, more than one million people in the world have been infected with the virus as of April 6, 2016, and the number of deaths caused by this virus has been reported to be more than 50,000. COVID-19, which is caused by an RNA virus, affects most of the respiratory system of people with the disease and is spreading catastrophically [4]. This virus has also infected our beloved country, Iran, like other countries in the world, and the fight against this virus is being carried out nationwide and comprehensively throughout the country. Due to the novelty of this virus and the amount of information available about the pathogenicity of COVID-19, as well as limited methods of control and treatment of this disease, currently, the most important way to deal with it is to prevent and inhibit the spread of the virus [5].

One of the most important protection ways from this disease is home quarantine. Quarantine means separating and restricting the movement of people who are potentially exposed to the contagious disease in order to ensure that they do not become ill, thereby reducing the risk of spreading the disease

to others. This interpretation is different from isolation. Isolation means separating people with infectious diseases from those who are not. However, the two terms are often used interchangeably when communicating with people. The term quarantine was first used in Venice, Italy, in 1127, during the outbreak of the contagious disease of leprosy and more widely during the outbreak of the plague or the Black Death. However, 300 years later, when the plague broke out, Britain began to use quarantine properly. Quarantine was recently used during the outbreak of the COVID-19. With the outbreak, all Chinese cities were quarantined, and thousands of foreign nationals returning from China were asked to quarantine at home or in government facilities. Activities at this level have already taken place. Quarantine has already been used in all cities. They did so in China and Canada in 2003 when severe acute respiratory syndrome broke out. Moreover, many villages in West Africa were also quarantined during the 2014 Ebola outbreak [6].

For those who are quarantined, this is an unpleasant experience. Separation from loved ones, loss of freedom, uncertainty about illness, and boredom can sometimes have devastating effects. During the quarantine at the time of the outbreak of previous infectious diseases, cases, such as suicide, excessive anger, and lawsuits for quarantine were reported. The potential benefits of general compulsory quarantine must be weighed against its potential psychological harm. Successful use of quarantine as a public health measure requires us to minimize the negative effects associated with it [7]. Quarantine is significantly more likely to include burnout or fatigue, separation from others, anxiety when dealing with febrile patients, irritability, insomnia, poor concentration and indifference, impaired ability to work, and unwillingness to work.

People who were quarantined reported various negative reactions (more than 20% of fear, 18% of anger, 18% of sadness, and 10% of guilt) during quarantine because of close contact with those potentially suffering from the disease. On the other hand, there were few reports of positive emotions (5% of feeling happy and 4% of feeling relieved). Qualitative studies also revealed another range of psychological responses to quarantine, including anxiety, fear, anger, sadness, numbness, and anxiety-induced insomnia [8]. The COVID-19 pandemic has affected almost all important economic, political, social, and even military aspects of all countries in the world. In other words, the investigation of the psychological effects of this viral disease on the mental health of people at different levels of society is of great importance.

Due to the pathogenicity of the virus, the rate of spread, and the percentage of deaths caused by it, the disease may affect the mental health of people at different levels of society, including patients, health care workers, families, children, students, and psychiatric patients in different ways.

Objectives
With this background in mind, in the current high-risk situation, identification of the dangers of coronavirus restrictions in this study is in response to the question of whether the quarantine caused by the coronavirus correlated with sleep quality, irritability, and self-esteem of the primary school students in District one of Karaj, Iran.

Materials and Methods
The statistical population of this correlational study included all primary school students in District one of Karaj, Iran, who are studying in the second semester of 2019-20. The total number of students in the first semester of 2019-20 was 4860, and according to Cochran's formula, the sample size was estimated at 377 cases. It should be noted that the individuals were selected from six schools by multi-stage cluster random sampling method and requested to complete the research questionnaires.

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N}\left(\frac{z^2 pq}{d^2} - 1\right)} = 377$$

The inclusion criteria were: (1) primary school students, (2) students of District one of Karaj, (3) students who have been studying at schools in District one of Karaj since the beginning of the year and did not transfer in the middle of the year, and (4) students who did not repeat a year twice. On the other hand, those who relocated in the middle of the year, and the students with relocated schools were excluded from the study.
The data collection tools included:

Coronavirus Quarantine Questionnaire
This questionnaire was developed and standardized by the World Health Organization in 2020 and included the amount of attendance at home, do online shopping from home, and meeting individuals and homes' needs in the days of the epidemic [9]. The coronavirus quarantine questionnaire has acceptable validity and reliability. The Cronbach's alpha coefficient was reported by the World Health Organization to be 0.88 for the overall test score. Ebrahimi, Zamani, and Haghi

[10] reported Cronbach's alpha of 0.83 and retest coefficient of 0.88 after three weeks.

Pittsburgh Sleep Quality Questionnaire

This questionnaire was developed in 1989 by Boyce et al. [11] and basically has nine items; however, since question five itself contains 10 sub-items, the whole questionnaire contains 19 items that are rated on a 4-point Likert scale from 0 to 3 [12].

Crick, Hitan, Malkova, and Bruce Irritability Questionnaire

This questionnaire consists of 21 items and is rated on a Likert scale from 0 to 3. Brahmand and Haji have standardized this scale in Iran [13]. Its reliability by Cronbach's alpha coefficient in the original version for the total test equals 0.90, and between the halves of the test is estimated at 0.78. It is worth mentioning that its validity was obtained at 0.82 after two weeks. The reliability of the translated version was also obtained by Cronbach's alpha method of 0.79, which indicates the validity of this scale and its scientific usability.

Coopersmith Self-Esteem Questionnaire

The Coopersmith Self-Esteem Questionnaire consists of five topics, including homework, social relationships, family, self, and future; moreover, it has four subscales, namely general self-esteem, social self-esteem (peers), family self-esteem (parents), and academic self-esteem (educational). This questionnaire has 58 two-choice questions with "yes" and "no" options that each person chooses one of the options according to his/her situation. Since the test has a scholastic subscale, it can only be used for students. This list refers to two mental aspects and obvious behaviors of self-regard [14]. This questionnaire has acceptable validity and reliability, and Cronbach's alpha coefficient was reported to be 0.88 for the overall test. Furthermore, regarding the validity of the total score of the test, the sub-scale of annoyance in the Eysenck personality test, the validity of negative and significant divergence, and the extroversion subscale, it has shown significant positive convergence validity. Rosenberg [12] reported a retest coefficient of 0.88 after five weeks and 0.70 after three years.

The results of the study by Bayat and Yaghoubi [16], which was conducted in Abhar, Iran, showed acceptable validity and reliability for Coopersmith self-esteem list. Cronbach's alpha in this study was calculated to be 0.796. In this study, the validity coefficient was calculated at 0.792 using the Eysenck test. In addition, to examine the construct validity, factor analysis was performed by the principal component analysis method, and the results showed that the list is of five saturation scales, which explain a total of 21% of the total variance of the variables. The reliability of the self-esteem questionnaire in the present study was 84%, which indicates high reliability. To analyze the results, initially, by calculating the Pearson correlation coefficient, the relationships among the main variables of the research, as well as subscales were identified. Subsequently, simultaneous multiple regression analysis was performed to explain and predict dependent variables (sleep quality, irritability, self-esteem) based on the independent variable (quarantine due to coronavirus). In the continuation of this section, using independent t-test, Pearson and Spearman correlation coefficients were employed to determine the relationship of demographic characteristics with sleep quality, irritability, and self-esteem.

Results

According to the results obtained from the demographic characteristics of 377 primary school students (first to sixth grades), 227 (60%) cases were male. The mean age of the participants was obtained at 10±7 years (age range: 7-12 years). Regarding the level of education, about 40%, 32%, 16%, and 11% of the subjects were in the fifth, first and second, third and fourth, as well as sixth grades of primary school, respectively.

The savings of about 24% of the surveyed people were between 700,000 and 900,000 Tomans. Moreover, 30% of the participants reported savings of about higher than one million Tomans, and about 19% of savings were between 300,000 and 500,000 Tomans; furthermore, savings of between 500,000 and 700,000 thousand Tomans were reported by 10% of the cases. It is worth mentioning that 17% of people did not answer this question.

Table 1. Pearson's correlation coefficient to investigate the relationship between quarantine and sleep quality

Variables	Mental quality of sleep	Delay in falling asleep	Duration and amount of sleep efficiency	Sleep disorders	Sleeping pills	Daily functional disorders	Total sleep quality
Quarantine caused by the virus	0.151	0.364	0.394	0.362	0.346	0.312	0.405

Table 2. Pearson correlation coefficient to investigate the relationship of quarantine with irritability and its components

Variables	Hostility/haste	Dissatisfaction and boredom	Decentralize /act impulsively	Incompatibility and perseverance	Anxiety /arousal	Total irritability score
Quarantine	0.254	0.069	0.285	0.99	0.303	0.324

Table 3. Pearson's correlation coefficient to investigate the relationship of quarantine with self-esteem and its components

Variables	Social self-esteem (peers)	Academic self-esteem (educational)	Public self-esteem	Family self-esteem (parents)	Total Self-esteem
Quarantine	0.254	0.058	0.099	0.306	0.391

According to the results of descriptive statistics, sleep quality has six components, and 19 questions have been used to measure each component. Among the components of sleep quality, "mental quality of sleep" with a mean score of 58.14 was the strongest, and "use of sleep drugs" with a mean score of 53 was the weakest component of this item. The mean±SD of descriptive statistics of quarantine scores was estimated at 414.89±54.19. The irritability variable has five dimensions, and the highest mean score belongs to the anxiety/arousal dimension with a mean score of 17.81. On the other hand, the lowest mean score (8.84) belongs to the dissatisfaction and impatience dimension, and finally, the self-esteem variable has three dimensions. Among the dimensions of self-esteem, "social self-esteem (peers)" with a mean weight of 3.06 (based on coefficients) was the strongest, and "general self-esteem" with a mean weight of 3.02 was the weakest dimension of the self-esteem in the subjects.

According to Table 1, it can be observed that the Pearson correlation coefficient shows a positive and significant relationship of about 0.41 between quarantine and total sleep quality (n=377, r=0.405, P<0.01). Therefore, it can be said that a longer time of quarantine leads to the higher total quality of their sleep. Therefore, there is a significant relationship between quarantine and sleep quality. According to Table 2, it can be observed that the Pearson correlation coefficient shows a positive and significant relationship of about 0.33 between quarantine and total irritability (n=377, r=0.334, P<0.01). Therefore, it can be said that the longer time of quarantine results in higher levels of total irritability, and there is a positive and significant relationship between quarantine and all components of irritability, except for dissatisfaction and impatience, as well as incompatibility and perseverance (hostility/haste, lack of focus/impulses to act, and anxiety/arousal) (P<0.05).

Furthermore, the result indicates that a longer time of quarantine in the students leads to higher levels of hostility/haste, lack of focus/impulse, and anxiety/arousal. Among the irritability components, quarantine has the strongest relationship with anxiety/arousal (0.30), and the weakest relationship with dissatisfaction and impatience (0.07).

According to the results of Table 3, it can be noted that the Pearson correlation coefficient shows a positive and significant relationship of about 0.39 between quarantine and total self-esteem (n=377, r=0.391, P<0.01). Therefore, it can be said that a longer time of quarantine results in higher levels of total self-esteem. Moreover, there is a positive and significant relationship between quarantine and all components of self-esteem, except for academic (educational) self-esteem (P<0.05). Accordingly, a longer time of quarantine in the students leads to lower levels of educational self-esteem. Among the components of self-esteem, quarantine has the strongest and weakest relationships with family self-esteem (parents) (0.30) and academic self-esteem (educational) (0.06), respectively.

Discussion

The global pandemic of COVID-19 has affected and paralyzed almost all important economic, political, social, and even military aspects of all countries worldwide. The investigation of the psychological effects of this viral disease on the mental health of people at different levels of society is of great importance. Due to the pathogenicity of the virus, the rate of spread, and the percentage of deaths caused by it, the disease may affect the mental health of people at different levels of society, including patients, health care workers, families, children, students, and psychiatric patients in different ways. Therefore, in the current high-risk situation, identification of the dangers of coronavirus restrictions in this study is in response to the question of whether the quarantine caused by the coronavirus correlated with sleep quality, irritability, and self-esteem of primary school students in District one of Karaj, Iran.

The results of this study were consistent with the findings of studies performed by Ahmadi, Johari, Adnan, Aftab, and Zafar et al. [17]. It was revealed that people who quarantined properly had a higher sleep quality. This can be explained by the fact that breaking the quarantine causes anxiety and worry, and consequently, leads to a decrease in the quality of sleep in people. Therefore, people who observed quarantine properly had a higher quality of sleep. The results of this study were also in line with the

findings of a study conducted by Yang, Li, Zhang, Zhang, Cheung, and Xiang [18]; however, the difference is that the aforementioned study was conducted on different groups. In explaining these results, it can be said that quarantine leads to restrictions, such as leaving home; accordingly, children are alone during this period and do not have much fun at home. Sometimes, the only entertainment is playing with smartphones and watching TV, which leads to fatigue and increased impulsivity. In addition, there is a positive and significant relationship between quarantine and all components of self-esteem, except for academic self-esteem, which showed that a longer time of quarantine among students led to higher levels of their academic self-esteem. Among the components of self-esteem, quarantine has the strongest and weakest relationships with family self-esteem (parents) and academic self-esteem (educational), respectively.

Zhou, Snoswell, Harding, Bambling, Edirippulige, and Bai [19] in a study entitled "Understanding Corona Virus 2019 and Corona Virus Disease Based on Evidence" concluded that the complications of Coronavirus 2019 in psychological symptoms are such that all individuals and survivors after illness require specialized counseling in the field of irritability and self-esteem since excessive presence at home leads to self-morbidity and apparent self-criticism that affects self-esteem.

Limitations of the study

Regarding the limitations of this study, one can refer to the lack of similar studies, refusal to transfer information by the respondent, and resistance to answering questions online. Respondents' patience in answering the questions is one of the other limitations that the indirect researcher faces in such a way that the respondent does not answer some of the questions. Lack of cooperation of individuals, incorrect answers, as well as lack of necessary budget to carry out and advance the research work are other limitations that the researchers face. However, practical suggestions have been provided to reduce the limitations.

Conclusions

The results showed the relationship of quarantine caused by Coronavirus with sleep quality, irritability, and self-esteem of primary school students in District one of Karaj, Iran.

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