Iran J Psychiatry 2022; 17: 2: 187-195

Original Article

Anxiety, Depression, and Predictors amongst Iranian Students Aged 8 to 18 Years during the COVID-19 Outbreak First Peak

Sanaz Bahrami-Samani[1], Mojgan Firouzbakht[2], Alireza Azizi[3], Shabnam Omidvar[3*]

Abstract

Objective: This study aimed to assess anxiety and depression during the COVID-19 outbreak among students aged 8 to 18 years and to determine related demographic and other related factors.
Method: A descriptive and analytical cross sectional study was conducted through web-based data collection which included 348 students aged 8 to 18 years in the state of Mazandaran, Iran during the first peak of COVID-19. Demographic and Revised Children's Anxiety and Depression Scale (RCADS-P) questionnaires were used to collect the data. The statistical tests including independent sample t test, ANOVA as well as linear regression were employed.
Results: The average age of the subjects was reported to be 12.2 ± 3.59 years. Age, father's occupation, following COVID-19 related news, and also nervousness related to infection were predictors of anxiety (11%). Moreover, age, mother's occupation, family communication and also the safety protocols practiced by the family were found to be predictors of depression in students (17%). A significant relationship was also found between the effect of quarantine on family communication and the anxiety and depression in students ($P < 0.001$).
Conclusion: Demographic characteristics affect student mental health during the COVID-19 outbreak. Moreover, family preventive protocols can predict depression in students aged 8 to 18 years. Better preventive precautions encourage less anxiety and depression.

Key words: *Anxiety; COVID-19; Depression; Outbreaks; Students*

1. Student Research Committee, Babol University of Medical Sciences, Babol, Iran.
2. Department of Nursing-Midwifery, Comprehensive Health Research Center, Babol Branch, Isalamic Azad University, Babol, Iran.
3. Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.

***Corresponding Author:**
Address: Department of Midwifery and Reproductive Health, Faculty of Nursing & Midwifery, Babol University of Medical Sciences, Ganj Afrooz Street, Babol, Iran, Postal Code: 4717647745.
Tel: 98-11 32199592-5, Fax: 98-11 32190181, Email: sh.omidvar@mubabol.ac.ir

Article Information:
Received Date: 2020/11/09, Revised Date: 2021/07/10, Accepted Date: 2021/12/05

SARS-COVID-19 was a viral disease that started in December 2019 in Wuhan, China (1). It was claimed as a global emergency by the World Health Organization (WHO) and it possessed a high mortality rate (2). The fast spread of this disease soon turned into a huge threat to human life all over the globe and resulted in numerous adverse effects on societal health (3). Almost 80% of people infected with COVID-19 experience mild symptoms and are treated at home. In 14% of cases, severe symptoms such as shortness of breath and pneumonia occur and 5% of cases experience extreme symptoms which lead to respiratory failure, septic shock and multi-organ failure (4). The outbreak of this disease has caused much fear and psychological stress which in turn causes a fear related to infection. This has caused a great deal of psychological distress due to social distancing, limited contact and economic decline which has led to a change in socio-psychological health of the society (5).

Psychological reactions including depression, anxiety and fear were common even during the outbreak of similar diseases such as SARS which invoked serious anxiety among people (6). Quarantine has been the means to control spread of this disease ever since its outbreak (7). Prior to the 1980s, psychological reactions in children to such pandemics and disasters were considered passive and were neglected (8). However, it is accepted that such pandemics and disasters can prove to be devastating to children's mental and psychological health due to the fact that children are unable to understand the immediate and long-term effects of such incidents, leading to excessive worrying and anxiety (9). Lack of hobbies, fear of disease, insufficient information, insufficient communication with friends and classmates, lack of personal space in some homes are some of the factors contributing to psychological disorders in children during quarantine (10). It has been reported that quarantine affects adolescents as well; leading to fear, anger and aggression (11). Schools being shut down and home-quarantine have had multiple effects on the physical and psychological health of children and teenagers (7, 12). Studies indicate that children and adolescents have lower physical activity during weekends and summer vacation leading to disrupted sleep patterns and diet. These problems are worse in case of children who do not participate in outdoor activities (13). In addition to those factors, long-term fear of COVID-19 infection, less communication with classmates, friends and teachers and, in some cases, family economic problems, cause permanent effects on psychological health of children and teenagers (10).

A study by Sprang *et al*. concluded that children who were in quarantine had four times more stress than children without this limitation (12). Norredam *et al*. reported that reduced communication in children with their guardian increases risk of psychological problems (14). Other studies indicate that separation from parents or death of parents in lower ages cause long-term psychological problems and disorders in children and can even lead to suicide in adulthood (15, 16). Children and adolescents are of great value to the future of every society and country. As it was discussed, quarantine and its limitations, cause psychological problems to the society. It is reported that better mental health in this group can lead to better coping with adulthood problems (17). Considering that COVID-19 has a high mortality rate and the fact that most people are aware of the dangers of this disease, and, also, mental health is one of the overlooked consequences of this disease, we have conducted this research to study anxiety and depression caused by COVID-19 among students (8 to 18 years) in home-quarantine during the 2020 first peak.

Materials and Methods

Participants and setting

This was a descriptive and analytical study conducted web-based and cross-sectionally with 348 students aged 8 to 18 in the state of Mazandaran, Iran in the year 2020 (during the first peak of COVID-19). The state was divided into two sections; eastern and western cities. Two cities were randomly chosen from each section and data collection was done until the required number of cases were reached. Due to the outbreak, all data were collected through online surveys. The contact information for the families were acquired through school principals and questionnaire links were given to the students' parents. The evaluation contained 51 questions and the consent form to participate in the study and acceptance of the data protection laws were included. Inclusion criteria were: 1) to be parent of a student 8 to 18 years of age; 2) to be living in Iran and in the state of Mazandaran during the health crisis situation due to COVID-19. Exclusion criteria included exposure to a stressful phenomenon such as death or separation of parents, known mental illness or use of mental illness medication.

To determine the sample size using the statistical formula below, we considered the following values for the variables: $\alpha = 0.05$, $P = 0.3$ (18) and $d = 0.05$. Therefore, the required sample size for this study was calculated to be 322 subjects.

Variables and instruments

A brief introduction and explanations were given before start of the survey and participants were notified that the data will be collected anonymously. The survey included demographic questions (Age, Gender, Occupation, parent's Education and eight more questions regarding COVID-19) and Revised Children's Anxiety and Depression –Parents' version (RCADS-P) questionnaire which includes 47 items out of which five were left out due to social distancing. This questionnaire for children and adolescents aged 8 – 18 was developed by Chorpita *et al*. in the year 2000 (19). This scale included subscales for separation anxiety, social anxiety, panic disorder,

generalized anxiety disorder, obsessive compulsive disorder, and Major Depression Disorder. The first five subscales indicate the total score for anxiety. The questions were all multiple-choice ranging from zero (Never) to three (Always) on the Likert scale. The validity of the questionnaire (Persian version) was evaluated by Rasouli *et al*. (20) which proved that the parents' version of the questionnaire is highly valid. The Cronbach's alpha coefficient was reported to be 0.93.

Ethics

Ethics approval for the study was obtained from the Medical Ethics Committee of Babol University of Medical Sciences (Reference: IR.MUBABOL.REC.1399.085).

Data analysis

Data was analyzed using SPSS 22 (SPSS Inc., Chicago, IL). P values less than 0.05 were considered statistically significant. Descriptive data, the measures of descriptive statistics, were used for data description, while the linear regression analyses were used to determine the predictors of anxiety and depression. The statistical tests including the independent sample t test and ANOVA were employed.

Results

This web-based cross-sectional study was conducted during March and April 2020. Response rate was reported as 56% and the average time for completion was about seven minutes and 43 seconds. 348 people participated and 98% completed the forms by mobile phones. The average age of the participants was 12.2 ± 3.59 years. 53% were boys. 72.4% of the participants reported following all the protocols for COVID-19. 26.7% reported following some of the protocols, and 0.9% reported following none. 45.4% of the parents reported positive improvement in their communication with their children, 38.2% believed there was no change in their communication and 16.4% reported a negative impact on their communication due to quarantine. The results indicate that 17.2% of the subjects considered themselves at high risk of infection (in their parents' point of view), while 82.8% believed to be in moderate or low risk of infection.

The most important source of information on COVID-19 was reported to be through social media (45%) and the least important was reported to be through friends (0.6%). 45.4% reported following the pandemic-related news rarely or never, 31% and 23.5% of people reported following the news moderately and intensively, respectively. 43.8% of the parents believed that their children feared infection by COVID-19 and 36.8% reported the infection of a relative or friend. Table 1 displays the mean and SD of the different dimensions of anxiety and depression.

Table 2 displays the mean anxiety and depression scores of students in regards to demographic variables and some other related factors. Our results signify that anxiety and depression do not demonstrate a relation with gender. Anxiety and depression scores were strongly influenced by birth order such that the third child and subsequent children of a family scored higher on the scales. Although the average age of the participants was 12.2 years, following their division into three different age groups, it was understood that the anxiety and depression scores of the third (oldest) group was higher than the other two groups. The anxiety and depression scores proved to be affected by education of parents; however, there was no relation with the occupation of the parents. Subjects, whose family followed better safety protocols, displayed less anxiety and depression. From the parents' point of view, quarantine had a positive effect on their communication with their children. A significant relationship was also found between the effect of quarantine on family communication and anxiety and depression in the children ($P < 0.001$). It can be seen from table 2 that higher scores of anxiety and depression were related to cases with negative impact of quarantine on family communication.

Students' most important source of information and news regarding Corona was reported to be radio, television and social media. Subjects who followed the news regularly had higher anxiety and depression scores. Anxiousness in subjects regarding infection was found to be significantly related to their anxiety and depression scores. We did not find a relation between history of infection with anxiety and depression scores ($F = 0.031$ $P = 0.93$ and $F = 0.39$ $P = 0.89$, respectively) among relatives and acquaintances.

The results of linear regression analysis showed that the variables student's age, father's occupation, following the news, and also nervousness related to infection can predict anxiety (11%) (Table 3). Moreover, the results also indicated that the age of subjects, mother's occupation, family communication and also the safety protocols taken by the family can predict depression in students (17%) (Table 4).

Table 1. Mean, Standard Deviation and Median of Depression and Anxiety and Its Dimensions According to Parents' View Point (RCADS-P)

Anxiety subscales	Mean ± SD	Median	Min-Max
Social anxiety	6.46 ± 4.17	6	0-21
Panic disorder	3.66 ± 4.34	2	0-26
Separation anxiety	3.5 ± 2.76	3	0-12
Generalized anxiety disorder	4.71 ± 3.67	4	0-18
Obsessive compulsive disorder	2.98 ± 3.24	2	0-16
Total anxiety	21.33 ± 14.15	11	2-100
Depression	5.92 ± 5.41	4	0-27

Table 2. Comparison of Anxiety and Depression Mean Scores According to Related Variables among Students (Aged 8 to 18 Years) in Quarantine during First Peak of the COVID-19 Outbreak

Variables		Anxiety		F/T	P-Value	Depression	F/T	P-value
		N	Mean ± SD			Mean ± SD		
Gender	Female	163	21.76 ± 15.04	0.482	0.63	6.33 ± 5.97	1.28	0.99
	Male	184	21.02 ± 13.35			5.58 ± 4.85		
Birth Order	First	236	20.43 ± 13.27	10.9	< 0.001	5.46 ± 4.88	20.06	< 0.001
	Second	91	20.71 ± 13.69			5.54 ± 5.15		
	Third and above	21	34.19 ± 19.38			12.58 ± 7.42		
Age group	Early adolescence	128	19.02 ± 11.20	2.783	0.063	4.28 ± 3.62	15.38	< 0.001
	Middle adolescence	85	21.91 ± 4.64			5.76 ± 4.79		
	Late adolescence	102	23.41 ± 16.69			8.03 ± 6.64		
Mother's education	≤Diploma	37	25.95 ± 15.23	2.67	0.047	9.20 ± 7.48	6.97	< 0.001
	Undergraduate	114	22.65 ± 14.5			6.24 ± 5.14		
	Postgraduate	135	19.7 ± 13.21			5.31 ± 5.01		
	Doctorate	59	19.3 ± 14.28			4.51 ± 4.21		
Mother's occupation	House wife	286	21.87 ± 14.65	1.52	0.125	6.06 ± 5.59	1.106	0.268
	Employee	62	18.75 ± 10.74			5.19 ± 4.33		
Father's education	≤Diploma	47	27.46 ± 16.06	5.11	0.022	8.29 ± 6.10	5.123	0.002
	Undergraduate	99	22.43 ± 14.13			6.30 ± 5.86		
	Postgraduate	116	18.61 ± 12.17			5.04 ± 4.78		
	Doctorate	84	19.79 ± 14.24			5.08 ± 4.59		
Father's occupation	Freelancer	317	21.37 ± 14.34	0.368	0.713	5.97 ± 5.44	0.753	0.452
	Government employee	58	18.75 ± 10.74			5.18 ± 4.89		
Self-evaluated level of personal preventive behavior	Completely	252	19.87 ± 13.67	5.14	0.006	5 ± 4.59	17.89	< 0.001
	partly	93	25 ± 14.60			8.08 ± 6.32		
	Not at all	3	30 ± 21.28			16 ± 11		
Effect of quarantine on students' relation with parents	Negative	57	27.59 ± 16.82	7.64	< 0.001	9.49 ± 6.01	16.97	< 0.001
	Without effect	33	19.03 ± 13.32			5.71 ± 5.42		
	positive	158	21.01 ± 13.17			4.82 ± 4.61		
The main source of health information	TV& Radio	156	21.27 ± 13.78	0.291	0.83	5.73 ± 5.13	0.281	0.83
	Satellite channels	33	22.99 ± 15.07			6.67 ± 7.03		
	Social media	157	20.97 ± 14.44			5.95 ± 5.34		
	Friends and relatives	2	27 ± 7.07			6 ± 4.24		
Concerns about getting COVID-19 infection	Yes	152	25.01 ± 14.46	10.55	< 0.001	6.82 ± 5.59	4.33	0.014
	No	147	17.37 ± 13.13			4.99 ± 5.28		
	I do not know	48	21.64 ± 13.24			5.85 ± 4.83		
Following COVID-19-related news	Always	36	35.46 ± 20.50	12.64	< 0.001	8.20 ± 7.92	3.35	0.010
	Often	46	23.49 ± 13.07			6.53 ± 4.82		
	Sometimes	108	19.93 ± 11.89			6.33 ± 5.47		
	Rarely	115	18.29 ± 11.32			5.10 ± 5		
	Never	43	18.86 ± 14.13			4.53 ± 3.38		
History of COVID-19 infection in family or acquaintances	Yes	128	21.20 ± 14.52	0.031	0.93	5.83 ± 5.18	0.039	0.89
	No	219	21.38 ± 13.99			5.94 ± 5.54		

Table 3. Predictors of Anxiety in Linear Regression among Iranian Students (Aged 8 to 18 Years)

Variables	Anxiety				Adjusted R2
	B	Beta (standardized)	T	P-value	
students' age	0.711	0.175	2014	0.032	
Father's occupation	-2.33	-0.151	-2.44	0.015	
Following COVID-19-related news	4.49	0136	-2.162	0.032	0.113
Concerns about contracting COVID-19 infection	-2.48	-0.191	-3.245	0.001	
Constant	0.711	0.175	2014	0.032	

Table 4. Predictors of Depression in Linear Regression among Iranian Students (Aged 8 to 18 Years)

Variables	Depression				Adjusted R2
	B	Beta (standardized)	T	P-value	
students' age	0.401	0.278	4.151	< 0.001	
Mother's occupation	-0.809	-0.142	-2.43	0.015	
Effect of quarantine on students' relation with parents	-0.974	-0.126	-2.23	0.029	0.175
Self-evaluated level of personal preventive behavior	1.57	0.138	2.35	0.019	
Constant	3.05		1.42	0.157	

Discussion

In this study, which was conducted during the first peak of COVID-19 in Mazandaran state, Iran, average anxiety and depression scores among students were 21.33 ± 14.15 and 5.92 ± 5.41 according to the RCADS Questionnaire, respectively. It would seem that the prevalence of these two psychological disorders was low among the studied cases, which is evident from the mean and SD of the data; however, the mean scores increase with age. These scores display a significant increase in the span of childhood until the final years of adolescence. Our findings were in accordance with a study in Shanghai by Tang *et al*. who reported a pattern witnessed in children and adolescents in which depression, stress and anxiety were augmented progressively and considerably beginning from primary school to senior secondary school (21). Systematic reviews of this condition also reported a similar pattern (22-24). Growing of psychological distress during adolescence could be due to hormonal changes and increased mental pressure (25). In addition, it could be said that the low anxiety and depression scores in children may be due to lack of correct information about the pandemic outbreak. Contrary to this, some studies suggest that lower age could be a risk factor for psychological health of society during the pandemic (28, 29). There is also limited information on the negative effects of methods used to prevent infection (lockdown, etc.) on the mental health of children. In a post-SARS and H1N1 study in Central and North America, 30% of parents reported PTSD in children who experienced isolation or quarantine (12). One possible reason for this finding is that the disease outbreak was not regarded as severe during the time of the study. Additionally, it is possible that participants might not have been well informed about the severity of the virus as mentioned previously.

During the SARS outbreak, many researchers focused on psychological effects in uninfected societies and reported a higher morbidity in younger populations (26). Although social distancing is not necessarily regarded as being alone, some studies report that one third of adolescents feel being in isolation (27, 28) and half of people aged 18 to 24 are actually home alone during quarantine, and there exists a known link between isolation and mental health (29).

Our results showed that the anxiety and depression scores are higher in the older group, which is in accordance with previous research in China (17). In the cases studied in this work, the mean anxiety and depression scores increased with age, and age happens to be a predicting factor in depression and anxiety symptoms (17% and 11%, respectively). A study in China showed that 43.7% of students who participated as the source of data, exhibited mild to severe depression-related behavior and 37.4% also exhibited severe anxiety-related behaviors. Display of behaviors related to both anxiety and depression were seen in 31.3% of cases (17). In the event of such a pandemic, depression is more prevalent in adolescents than in adults (30). The difference between the mentioned study and our study could be due to different modes of reporting, as we used the parental version of the questionnaire while the Chinese researchers asked the questions from adolescents; suggesting a difference in the parents' point of view and perception of anxiety and depression in adolescents.

Researchers report that prevalence of anxiety in boys was lower than in girls (32.5% to 40.4%). It is also reported that the frequency of male school students with depression and anxiety was lower than females (41.7% to 45.5% and 36.2% to 38.4%, respectively). In addition, anxiety and depression become more prevalent with greater years of education (17). Some studies indicate that female gender is a common risk factor in mental

health (17, 31-36), however, we did not witness a relationship between gender and anxiety and depression scores. A study by Tang *et al*. was in accordance with our study (21). In a recent study on psychological effects of quarantine by Samantha Brook *et al*., it was pointed out that the sign of posttraumatic stress syndrome was prevalent in 28 to 34% of cases, and fear was prevalent in 20% of them. Other prevalent behaviors during quarantine include depression, moodiness, irritability, insomnia, rage and emotional fatigue (10).

The present study indicates an inverse relationship between safety precautions taken by people and anxiety ($P < 0.006$) or Depression ($P < 0.001$). A research in China proved that in adolescent cases who had better knowledge and practiced better preventive behaviors, scores for depression and anxiety were lower in comparison to those with less knowledge and preventive behaviors (1). We found that following the pandemic news through social media displays a significant relation with high scores of depression and anxiety. Other studies have also suggested that spending more time in social media or following COVID-19-related news, insufficient social support, insufficient protective behaviors and jobs with high infection risks are also related to high risk of mental and psychological disorders (37-41) which are in accordance with our results. Social media plays a vital role in spreading information and news; however, it can also be used to spread misinformation, resulting in unnecessary panic (42-45).

In this study, the mean depression and anxiety scores of children with working mothers and fathers who had an office job was lower than those with mothers who were housewives and parents who had private jobs; however, this relationship was not statistically significant. The mean scores were also affected by the education of parents. The mean scores were lower in case of students with highly educated parents. Holling *et al*. reported that low economic and social status should be considered as a risk factor for children's mental health during extreme situations such as the pandemic (46). Prevalence of depression is affected by social and economic status. This, hence, is a must to be studied in different countries (46, 47).

According to parents, quarantine had an impact on their communication with their children, and most of them were under the impression that this impact was positive. The results presented in this study are consistent with results reported by Lau *et al*. who studied quality of life and mental health among citizens of Hong Kong during the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003 (48). We found a relation between impact of quarantine on family communication and the depression and anxiety score of children ($P < 0.001$). This relationship is in a way that the mean score was significantly higher in case of children whose communication with family had been sullied during the quarantine. The change in communication is due to change in life pattern. As parents are usually at work and children are unable to spend much time with them, the quarantine causes the two groups to spend a lot of time in each other's presence. Hence, parents find more time to analyze the children. Symptoms which went unnoticed before were now clear. This can also contribute to stress, depression and anxiety in social isolation. On the other hand, social isolation is a great chance for better communication of family members, which was utilized in most cases.

Considering the fact that school is not only a place to study but also a second home to children which offers communication among children of the same age and also a place for physical activity. Thus, it contributes to mental health of children. Therefore, schools being shut down and home quarantine leads to changes in lifestyle, nutrition and sleep patterns. Spending long durations of time watching television and using cell phones is a threat to mental health in children. As schooling and study are now conducted virtually, this provides a great chance to study prevalence and symptoms of anxiety and depression in children and adolescent. Our results indicate that better knowledge of the epidemic and safety precautions taken act in a protective way against psychological threats by decreasing anxiety and depression in the society. These results are in accordance with previous studies which indicate that wearing masks and maintaining hand hygiene reduces anxiety and depression during the pandemic (30). However, social media and news can lead to reverse effects on anxiety and depression by false news about the pandemic (49). News related to recovered patients and advancements in medical treatment and vaccine production can also reduce anxiety levels (30). Hence, governments are obliged to provide accurate information and news and reject false news to reduce the negative effects on mental health of the society. Intensifying protection and controlling the spread of the virus not only reduces infection but also avoids potential psychological threats to the society. Therefore, governments must provide facilities, services and equipment such as masks, disinfectants and other hygiene products in abundance.

Limitation

The limitations of this study include selection bias and the fact that it was conducted through social media which can affect participation of cases with lower economic status. Another limitation was that the information was provided by the parents which can be inaccurate at times.

Conclusion

The present study exhibited that anxiety and depression was less in comparison to similar studies among the same age range during first peak of the COVID-19 outbreak. Interestingly, the quarantine causes parents and children to spend a lot of time in each other's presence, offering a great chance for better communication and parental support which might be a reason for experiencing less anxiety and

depression among students. The study indicates an inverse relation between safety precautions taken by people and anxiety or depression. This could be due to better assurance in people taking better precautions.

Acknowledgment

We gratefully acknowledge the Health Research Institute, Babol University of Medical Sciences, for approving the protocol for this study and providing financial support (Grant number: 9909507).

Conflict of Interest

None.

References

1. Luan RS, Wang X, Sun X, Chen XS, Zhou T, Liu QH, et al. [Epidemiology, Treatment, and Epidemic Prevention and Control of the Coronavirus Disease 2019: a Review]. Sichuan Da Xue Xue Bao Yi Xue Ban. 2020;51(2):131-8.
2. Şencan I, Kuzi S. Global threat of COVID-19 and evacuation of the citizens of different countries. Turk J Med Sci. 2020;50(Si-1):534-43.
3. Enserink M, Kupferschmidt K. With COVID-19, modeling takes on life and death importance. Science. 2020;367(6485):1414-5.
4. Tavakoli A, Vahdat K, Keshavarz M. Novel Coronavirus Disease 2019 (COVID-19): An Emerging Infectious Disease in the 21st Century. ISMJ. 2020;22(6):432-50.
5. Fegert JM, Vitiello B, Plener PL, Clemens V. Challenges and burden of the Coronavirus 2019 (COVID-19) pandemic for child and adolescent mental health: a narrative review to highlight clinical and research needs in the acute phase and the long return to normality. Child Adolesc Psychiatry Ment Health. 2020;14:20.
6. Lima CKT, Carvalho PMM, Lima I, Nunes J, Saraiva JS, de Souza RI, et al. The emotional impact of Coronavirus 2019-nCoV (new Coronavirus disease). Psychiatry Res. 2020;287:112915.
7. Wang G, Zhang Y, Zhao J, Zhang J, Jiang F. Mitigate the effects of home confinement on children during the COVID-19 outbreak. Lancet. 2020;395(10228):945-7.
8. Rigamer EF. Psychological management of children in a national crisis. Journal of the American J Am Acad Child Psychiatry. 1986;25(3):364-9.
9. Balaban V. Psychological assessment of children in disasters and emergencies. Disasters. 2006;30(2):178-98.
10. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. Lancet. 2020;395(10227):912-20.
11. Saurabh K, Ranjan S. Compliance and Psychological Impact of Quarantine in Children and Adolescents due to COVID-19 Pandemic. Indian J Pediatr. 2020;87(7):532-6.
12. Sprang G, Silman M. Posttraumatic stress disorder in parents and youth after health-related disasters. Disaster Med Public Health Prep. 2013;7(1):105-10.
13. Mason F, Farley A, Pallan M, Sitch A, Easter C, Daley AJ. Effectiveness of a brief behavioural intervention to prevent weight gain over the Christmas holiday period: randomised controlled trial. Bmj. 2018;363:k4867.
14. Norredam M, Nellums L, Nielsen RS, Byberg S, Petersen JH. Incidence of psychiatric disorders among accompanied and unaccompanied asylum-seeking children in Denmark: a nation-wide register-based cohort study. Eur Child Adolesc Psychiatry. 2018;27(4):439-46.
15. Santavirta T, Santavirta N, Betancourt TS, Gilman SE. Long term mental health outcomes of Finnish children evacuated to Swedish families during the second world war and their non-evacuated siblings: cohort study. Bmj. 2015;350:g7753.
16. Abel KM, Heuvelman HP, Jörgensen L, Magnusson C, Wicks S, Susser E, et al. Severe bereavement stress during the prenatal and childhood periods and risk of psychosis in later life: population based cohort study. Bmj. 2014;348:f7679.
17. Zhou SJ, Zhang LG, Wang LL, Guo ZC, Wang JQ, Chen JC, et al. Prevalence and socio-demographic correlates of psychological health problems in Chinese adolescents during the outbreak of COVID-19. Eur Child Adolesc Psychiatry. 2020;29(6):749-58.
18. Taylor BE, Chekaluk E, Bennett J. Post-Traumatic Stress Disorder, Depression and Anxiety among North Korean Refugees: A Meta-Analysis. Psychiatry Investig. 2017;14(5):550-61.
19. Chorpita BF, Yim L, Moffitt C, Umemoto LA, Francis SE. Assessment of symptoms of DSM-IV anxiety and depression in children: a revised child anxiety and depression scale. Behav Res Ther. 2000;38(8):835-55.
20. Rasouli, H., Validation Standardization Revised version of the Depression Anxiety Scale for Children, in 8th international conference in Psychology and sociology. 2017: Tehran,Iran.
21. Tang S, Xiang M, Cheung T, Xiang YT. Mental health and its correlates among children and adolescents during COVID-19 school closure: The importance of parent-child discussion. J Affect Disord. 2021;279:353-60.
22. Barker MM, Beresford B, Bland M, Fraser LK. Prevalence and Incidence of Anxiety and Depression Among Children, Adolescents, and Young Adults With Life-Limiting Conditions: A Systematic Review and Meta-analysis. JAMA Pediatr. 2019;173(9):835-44.
23. Xie X, Xue Q, Zhou Y, Zhu K, Liu Q, Zhang J, et al. Mental Health Status Among Children in Home Confinement During the Coronavirus

Disease 2019 Outbreak in Hubei Province, China. JAMA Pediatr. 2020;174(9):898-900.
24. Tang X, Tang S, Ren Z, Wong DFK. Prevalence of depressive symptoms among adolescents in secondary school in mainland China: A systematic review and meta-analysis. J Affect Disord. 2019;245:498-507.
25. Schubert KO, Clark SR, Van LK, Collinson JL, Baune BT. Depressive symptom trajectories in late adolescence and early adulthood: A systematic review. Aust N Z J Psychiatry. 2017;51(5):477-99.
26. Sim K, Huak Chan Y, Chong PN, Chua HC, Wen Soon S. Psychosocial and coping responses within the community health care setting towards a national outbreak of an infectious disease. J Psychosom Res. 2010;68(2):195-202.
27. Loades ME, Chatburn E, Higson-Sweeney N, Reynolds S, Shafran R, Brigden A, et al. Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID-19. J Am Acad Child Adolesc Psychiatry. 2020;59(11):1218-39.e3.
28. Albagmi FM, AlNujaidi HY, Al Shawan DS. Anxiety levels amid the COVID-19 lockdown in Saudi Arabia. Int J Gen Med. 2021;14:2161.
29. Wang J, Lloyd-Evans B, Giacco D, Forsyth R, Nebo C, Mann F, et al. Social isolation in mental health: a conceptual and methodological review. Soc Psychiatry Psychiatr Epidemiol. 2017;52(12):1451-61.
30. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. Int J Environ Res Public Health. 2020;17(5):1729.
31. Li G, Miao J, Wang H, Xu S, Sun W, Fan Y, et al. Psychological impact on women health workers involved in COVID-19 outbreak in Wuhan: a cross-sectional study. J Neurol Neurosurg Psychiatry. 2020;91(8):895-7.
32. Kang L, Ma S, Chen M, Yang J, Wang Y, Li R, et al. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. Brain Behav Immun. 2020;87:11-7.
33. 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(5):504-11.
34. Li X, Yu H, Bian G, Hu Z, Liu X, Zhou Q, et al. Prevalence, risk factors, and clinical correlates of insomnia in volunteer and at home medical staff during the COVID-19. Brain Behav Immun. 2020;87:140-1.
35. Wang Y, Di Y, Ye J, Wei W. Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China. Psychol Health Med. 2021;26(1):13-22.
36. Li X, Dai T, Wang H, Shi J, Yuan W, Li J, et al. [Clinical analysis of suspected COVID-19 patients with anxiety and depression]. Zhejiang Da Xue Xue Bao Yi Xue Ban. 2020;49(2):203-8.
37. Guo Q, Zheng Y, Shi J, Wang J, Li G, Li C, et al. Immediate psychological distress in quarantined patients with COVID-19 and its association with peripheral inflammation: A mixed-method study. Brain Behav Immun. 2020;88:17-27.
38. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry Res. 2020;288:112954.
39. Ni MY, Yang L, Leung CMC, Li N, Yao XI, Wang Y, et al. Mental Health, Risk Factors, and Social Media Use During the COVID-19 Epidemic and Cordon Sanitaire Among the Community and Health Professionals in Wuhan, China: Cross-Sectional Survey. JMIR Ment Health. 2020;7(5):e19009.
40. Tan W, Hao F, McIntyre RS, Jiang L, Jiang X, Zhang L, et al. Is returning to work during the COVID-19 pandemic stressful? A study on immediate mental health status and psychoneuroimmunity prevention measures of Chinese workforce. Brain Behav Immun. 2020;87:84-92.
41. Zhang Y, Ma ZF. Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Local Residents in Liaoning Province, China: A Cross-Sectional Study. Int J Environ Res Public Health. 2020;17(7).
42. Hussain W. Role of social media in COVID-19 pandemic. The International Journal of Frontier Sciences. 2020;4(2):59-60.
43. Roth F, Brönnimann G. Risk analysis using the internet for public risk communication. Focal report/Crisis and Risk Network (CRN) no. 2013;8.
44. Kramer AD, Guillory JE, Hancock JT. Experimental evidence of massive-scale emotional contagion through social networks. Proc Natl Acad Sci U S A. 2014;111(24):8788-90.
45. Niederkrotenthaler T, Stack S, Till B, Sinyor M, Pirkis J, Garcia D, et al. Association of Increased Youth Suicides in the United States With the Release of 13 Reasons Why. JAMA Psychiatry. 2019;76(9):933-40.
46. Hölling H, Schlack R, Petermann F, Ravens-Sieberer U, Mauz E. [Psychopathological problems and psychosocial impairment in children and adolescents aged 3-17 years in the German population: prevalence and time trends at two measurement points (2003-2006 and 2009-2012): results of the KiGGS study: first follow-up (KiGGS Wave 1)]. Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz. 2014;57(7):807-19.
47. Compton WM, Conway KP, Stinson FS, Grant BF. Changes in the prevalence of major

depression and comorbid substance use disorders in the United States between 1991-1992 and 2001-2002. Am J Psychiatry. 2006;163(12):2141-7.
48. Lau JT, Yang X, Tsui HY, Pang E, Wing YK. Positive mental health-related impacts of the SARS epidemic on the general public in Hong Kong and their associations with other negative impacts. J Infect. 2006;53(2):114-24.
49. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. PLoS One. 2020;15(4):e0231924.