The Consequences of COVID-19-Related Anxiety on Children’s Health: A Cross-Sectional Study

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Research

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Abstract

**Background:** The emergence of the COVID-19 pandemic has triggered a worldwide health catastrophe. Anxiety caused by COVID-19 has had a negative impact on people’s physical and mental health. According to the findings of the research, significant emphasis has been devoted to measures linked to the identification of persons with coronavirus infection, but the identification of the affected individuals’ mental health issues has been overlooked. Despite study data indicating an increase in fear and anxiety in patients with coronavirus and others, little research on COVID-19-related cardiac disease has been conducted so far.

**Methods:** This cross-sectional study used a survey method with a chosen self-reported questionnaire for data collection from Mashhad residents. The research sample included 435 households with children aged 5 to 18. The data was analyzed using SPSS software version 25 and comprised two measures, (1) the Coronary Disease Anxiety Scale (CDAS) and (2) the Child Health Questionnaire (CHQ) developed by Landgraf and Abets. The findings indicated that COVID-19-related anxiety has a detrimental influence on children's health. According to the data, 19% of the children's variance showed negative effects on health (β = -0.625, Sig = 0.001, Adj.R2 = 0.193).

**Results:** The findings revealed a significant difference in children's health mean scores related to forms of insurance coverage, parents' education level, housing status, and COVID-19-associated anxiety. Children's anxiety levels have increased, causing harm to their health and a reduction in their health status.

**Conclusion:** The outcomes of the study will help health professionals and governments establish appropriate protective measures to address this worldwide health problem.

**Background**

The emergence of the novel coronavirus diseases (COVID-19) began in late 2019 in China, and its rapid spread to other areas of the world has generated widespread anxiety[1–4]. On 2020-02-19, this disease was identified in Qom, Iran, and quickly spread throughout the country [5–8]. According to the World Health Organization (WHO), more than 161513458 individuals worldwide have been infected with this virus, with 3352109 losing their lives as of May 15, 2021 [9–11]. There have been 2732152 confirmed cases and 76,433 deaths in Iran [9, 12].

The World Health Organization has classified CoronaVirus Disease (COVID-19) as an emergency health hazard and a global concern [13–15]. The presence of widespread pandemics has frequently increased levels of dread and anxiety, leading to widespread behavioral problems and severe consequences for physical and mental health[16, 17]. Furthermore, stress caused by uncertainty, panic, or other psychological issues has had a negative impact on families. Despite the presence of vulnerable populations such as children, the elderly, and the sick, many families have been subjected to long-term home quarantines, and these limited contacts have resulted in circumstances of isolation, anxiety, and
stress[18–20]. Previous studies have shown that public health issues in the post-crisis era are significant, and correlational research in this field should be aggressively pursued [21–23].

As previously stated, fear and anxiety about COVID-19 illness are now widespread[24]. Anxiety is a frequent unpleasant feeling felt by people during a disease outbreak[25]. Previous research has found that in the early phases of the coronavirus outbreak in China, more than half of respondents experienced significant psychological symptoms, with around one-third reporting moderate to severe anxiety[26–28]. Concerning the prevalence of anxiety in individuals, one of the primary issues that may be stated is the health condition of children, in such a manner that; the United Nations has encouraged all countries to prepare for the care and health of children, particularly during this time. The importance of this issue is such that worldwide strategies for the health of children and their mothers address four variables in decreasing child mortality and five aspects in promoting newborn health[29, 30]. It is worth noting that, because children's cognitive capacity is restricted in childhood, they learn the majority of their knowledge of the world around them with the assistance of their parents, and as they get older, their intellectual powers increase and they progressively become independent. In the meanwhile, parents are a valuable source of guidance and instruction[31]. One of the preventive factors against children's psychological and behavioral disorders that has a direct influence on children's health is the interaction between parents and children[32, 33].

According to the findings of the research, significant emphasis has been devoted to measures linked to the identification of persons with coronavirus infection, but the identification of the afflicted individuals' mental health issues has been ignored[34–36]. Despite study data indicating an increase in fear and anxiety in patients with coronavirus and others, little research on corona heart disease has been conducted to date[21]. Consequently, in 2021, this study investigated the link between corona anxiety and children's health in parents with children aged 5–18 years in Mashhad, a city in northern Iran.

**Methods**

**Design**

This cross-sectional research was conducted in the northern Iranian metropolis of Mashhad in 2021.

**Population**

Families with children aged 5 to 18 years were included in the statistical population. The SPSS Sample Power program was used to calculate the sample size.

**Measures (anxiety)**

The COVID-19 Anxiety Scale (CDAS) [37] and the Child Health Questionnaire (CHQ) Landgraf and Abets (1996) [38] were utilized in the current investigation. The COVID-19 Anxiety Scale, developed and validated in Iran, is used to assess anxiety induced by COVID19-related heart disease. This questionnaire consists of 18 items and two components. Items 1–9 evaluate psychological symptoms, whereas items
10–18 evaluate physical problems. The tool is evaluated using a four-point Likert scale (never, sometimes, most of the time, and always). The respondents’ greatest and lowest scores on this questionnaire ranged from 0 to 54. A high level of anxiousness is indicated by a high score. The Cronbach's alpha technique determined the instrument's reliability for the first factor ($\alpha = 0.879$), the second factor ($\alpha = 0.867$), and the entire questionnaire ($\alpha = 0.919$) [37]. The Landgraf and Abets Child Health Questionnaire was used to examining children's health. This questionnaire's basic form and 28 items had 13 subscales that investigated two aspects of physical health (including functional subscales or physical problems and limitations, general health, and physical pain) and psychological health (includes subscales of social, emotional-behavioral limitations, self-esteem, mental health, and behavior and family problems). This questionnaire is one of the most widely used scales related to health and quality of life for children and adolescents, assessing noticeable areas of child function and health based on parent reports, and it can be used for girls and boys of various ages, as well as parents with varying levels of education and working and marital situations[39]. Validity studies in Iran have shown that CHQ can discriminate between children with certain chronic illnesses and that it is associated with other health and quality of life scales. This questionnaire has 22 questions. The questions are scored on a 5-point Likert scale. The tool is intended to assess eight aspects of child mental health, child self-satisfaction, child mobility, child performance, parental worry, parental limits, child general health, and overall child health score. The findings of this tool's factor analysis in the research of Golzar et al. [40] were reported twice, at 0.05 and 0.06, respectively, indicating that this instrument is well-suited for usage in Iran. It should be noted that the questions in this instrument are evaluated using a Likert scale, and the tool's validity has been investigated in internal and external studies [41, 42].

**Data Collection**

The following assumptions are proposed for determining sample size in the current study: 1- The probability of the first type error is a maximum of 5% (alpha value), 2- The probability of the second type error is a maximum of 20% (beta value), 3- The test power is 80%, 4- The 95% confidence level, and 5- the sample size is such that at least 15% of the correlation is detected. The sample size of 540 individuals was then established using the SPSS Sample Power program. The surveys were sent online to parents with children aged 5 to 18 years, and 435 completed questionnaires were used as the foundation for analysis.

**Data analysis**

For data analysis, the SPSS-22 program was used. The data was further analyzed using two independent sample t-tests, one-way analysis of variance, and simple linear regression.

**2.6. Ethics approval and consent to participate**

All procedures in studies involving human subjects were carried out in line with the institutional research committee's ethical standards, as well as the 1964 Helsinki Declaration and its subsequent modifications or similar ethical standards. The study procedure was authorized by the Medical Ethics Committee at the University of Social Welfare and Rehabilitation Sciences in Tehran (IR.USWR.REC.1400.043). This study
included individuals who provided informed consent. Before commencing the study, the authors acquired verbal informed consent from all participants, and all participants completed the informed written consent-form after being told about the purposes of the project.

**Results**

**Sociodemographic**

According to the findings, the mean age of children was 12.21 years, while the mean age of parents was 39.16 years. The respondents' minimum age was 23 years, and their maximum age was 65 years. The mean CHQ and CDAS score of children was 210 (48.2%) 87.1 ± 12.1, 12.2 ± 8.4 in the boy group and 225 (51.6%) 84.1 ± 12.8, 13.1 ± 9.2 in the girl group, and the t-test findings indicated that there was a significant difference in the mean health score of children in the gender group of children (P < 0.05). Other findings revealed that the greatest mean health score of children was connected to children with supplementary insurance (90.9 ± 4.1), and the lowest health score was related to uninsured children (81.6 ± 14.7). Furthermore, children with supplementary insurance had the lowest mean CDAS score (9 ± 5.5). The ANOVA test findings also revealed a significant difference in the mean score of children's health based on the status of children's insurance (P < 0.05). The highest mean health score of children was associated with parents with a bachelor's degree (87.7 ± 10.6), while the lowest health score was associated with illiterate parents (80.5 ± 14.3). In addition, children with a Ph.D. had the lowest mean CDAS score (8.2 ± 5). The ANOVA test findings also indicated a significant difference in the mean score of children's health based on parents’ educational position (P < 0.05). The findings on the mean anxiety score from the pandemic revealed that depending on the status of the type of housing, children living in leased housing had the highest mean anxiety score from the corona (15.3 ± 10.1) (P < 0.05). The ANOVA test results also revealed a significant difference in the mean score of children's health based on dwelling type (P < 0.05) (Table 1).

The findings of the regression test showed that that anxiety has an effect on children's health ($\beta$=-0.625, Sig.=0.001, Adj.R²=0.193). This variable accounted for 19% of the variation in children's health. According to the data, the higher the degree of corona anxiety among youngsters in Mashhad, the worse their health (Table 2).

**Table 1:** Demographic characteristics and mean scores of children's health and COVID-19-related anxiety in participants
| Variables                                           | (percent)umber | Children's health (Mean ±SD) | The anxiety of the corona (Mean ±SD) |
|-----------------------------------------------------|----------------|-------------------------------|--------------------------------------|
| Number of children                                  |                |                               |                                      |
| One child                                           | 141 (32.3%)    | 86.9±12.1                     | 12.4± 8.9                            |
| Two children                                        | 203 (46.6%)    | 85.5±12.4                     | 12.7± 8.9                            |
| Three children                                      | %15.8 (69)     | 84.1±12.8                     | 13.5± 9.2                            |
| Four children                                       | 16 (3.7%)      | 83 ±16.1                      | 12.6± 8.6                            |
| Five children                                       | 6 (1.4%)       | 93±16.9                       | 11.3± 9.6                            |
| **p-value**                                         |                | ANOVA Test=0.233              | ANOVA Test=0.923                      |
| Child gender                                        |                |                               |                                      |
| Boy                                                 | 210 (48.2%)    | 87.1±12.1                     | 12.2± 8.4                            |
| Girl                                                | 225 (51.6%)    | 84.1±12.8                     | 13.1± 9.2                            |
| **p-value**                                         |                | T-Test=0.017*                 | T-Test=0.774                         |
| Educational status of the child                     |                |                               |                                      |
| Kindergarten                                        | 5 (1.1%)       | 84.8±8.1                      | 14.6± 2.7                            |
| First preschool                                     | 5 (1.1%)       | 84.6±13.8                     | 15± 8.8                              |
| Second preschool                                    | 8 (1.8%)       | 86±8.8                        | 10.5± 11.5                           |
| Elementary                                          | 189 (43.3%)    | 86.3±12.9                     | 13.1± 8.4                            |
| First high school                                   | 99 (22.7%)     | 86.4±11.8                     | 11.4± 8.8                            |
| Second high school                                  | 129 (29.6%)    | 83.8±12.9                     | 13.1± 9.5                            |
| **p-value**                                         |                | ANOVA Test=0.607              | ANOVA Test=0.634                      |
| Children's insurance status                         |                |                               |                                      |
| Iranian insurance                                   | 5 (1.1%)       | 84.4±16.1                     | 15.8± 11.7                           |
| Supplementary insurance                             | 10 (2.3%)      | 90.9±4.1                      | 9± 5.5                               |
| Health insurance                                    | 79 (18.1%)     | 84.9±12.1                     | 13.3± 9.3                            |
| Social security insurance                           | 193 (44.3%)    | 87.5±11.9                     | 11.8± 8.7                            |
| Health insurance                                    | 102 (23.4%)    | 84.2±12.4                     | 12.9± 7.8                            |
| No insurance                                        | 44 (10.1%)     | 81.6±14.7                     | 15.2±10.1                            |
| **p-value**                                         |                | ANOVA Test=0.029*             | ANOVA Test=0.127                      |
| Gender of parents                                   |                |                               |                                      |
| Female                                              | 344 (78.9%)    | 85±13.1                       | 12.8± 8.8                            |
| Male                                                | 91 (20.9%)     | 87.5±10                       | 12± 8.9                              |
| **p-value**                                         |                | T-Test=0.057                  | T-Test=0.415                         |
| Marital status of parents                           |                |                               |                                      |
| Married                                             | 418 (95.9%)    | 85±12.3                       | 12.5± 8.6                            |
| Divorced and separated                              | 10 (2.3%)      | 81±14.4                       | 17.4±12.3                            |
| Deceased wife                                       | 7 (1.6%)       | 75.7±18.5                     | 12.5±15                              |
| **p-value**                                         |                | ANOVA Test=0.056              | ANOVA Test=0.240                      |
| Parents' education                                  |                |                               |                                      |
| Illiterate                                          | 7 (1.6%)       | 80.5±14.3                     | 13± 9.7                              |
| Elementary                                          | 52 (11.9%)     | 82.6±14.4                     | 12.3± 9.4                            |
| Secondary                                          | 62 (14.2%)     | 83.6±13.8                     | 14.2±11.4                            |
| High school diploma                                 | 129 (29.6%)    | 87.6±11.6                     | 12.7± 8.2                            |
| Associate Degree                                    | 31 (7.1%)      | 82.7±13.3                     | 14.9±10.8                            |
| Bachelor Degree                                     | 101 (23.2%)    | 87.7±10.6                     | 11.9± 7.8                            |
| MA                                                  | 49 (11.2%)     | 83.9±13.3                     | 11.5± 7.3                            |
| PhD                                                 | 4 (0.9%)       | 83±19.5                       | 8.2± 5                               |
| **p-value**                                         |                | ANOVA Test=0.045*             | ANOVA Test=0.483                      |
| Type of housing                                     |                |                               |                                      |
| Owner                                               | 332 (76.1%)    | 86.3±12.6                     | 11.9± 8.2                            |
| Rental                                              | 87 (20%)       | 83.6±10.1                     | 15.3±10.1                            |
| Government-leased                                   | 16 (3.7%)      | 80.8±18.3                     | 14± 12.7                             |
| Parents’ job          | house | p-value | ANOVA Test=0.063 | ANOVA Test=0.006* |
|-----------------------|-------|---------|------------------|------------------|
| Full time employee    | 128 (29.4%) | 86.7±10.9 | 11.6±7.9          |
| Part time employee    | 50 (11.5%)  | 85.5±12.7 | 14.2±10.1         |
| Unemployed            | 11 (2.5%)   | 75.4±17.8 | 17.2±11.9         |
| Retired               | 7 (1.6%)    | 88.3±10.4 | 8.8±3.8           |
| Housewife             | 239 (54.8%) | 85.4±13.1 | 12.8±9.1          |
| p-value               |       |         | ANOVA Test=0.071 | ANOVA Test=0.115 |

Table 2: Results of the linear regression between COVID-19-related anxiety and child health variables

| Child health variable | Non-standard coefficients | Standard coefficients | T | Sig. level | R | R Square | Adjusted R Square |
|-----------------------|---------------------------|-----------------------|---|------------|---|----------|------------------|
| Constant              | 95.513                    | 0.947                 | - | 98.759     | 0.441 | 0.195    | 0.193            |
| COVID-19-related anxiety | -0.625                  | 0.061                 | -0.441 | -10.235    | 0.001 |          |                  |

**Discussion**

The current study investigated the relationship between COVID-19-related anxiety and the health of children aged 5 to 18 in Mashhad, a city in northeastern Iran. According to the findings of this study, COVID-19-related anxiety impacted children's health. Other studies have revealed that COVID-19 disease causes emotions of uncertainty, fear, and isolation, as well as sleep difficulties, anorexia, depression, loneliness anxiety, post-traumatic stress disorder, and obsessive-compulsive disorder in children [43, 44]. On the other hand, quarantine regulations and social isolation have resulted in a lack of physical exercise in them[45]. This separation has restricted children's opportunities to acquire social behaviors and, in some cases, behavioral and emotional problems[46]. Other research has suggested that providing appropriate information about COVID-19 illness might relieve children's emotions of fear, worry, and doubt, as well as teach them good coping strategies[47]. According to the findings of the research, children's degree of awareness had a significant link with their anxiety, such that children who were more aware of this sickness experienced greater anxiety. Concerning the principles of crisis intervention, there is a need to appropriately increase awareness by addressing the idea of epidemic cessation. Increasing awareness through interventions such as social distance during the epidemic and obeying sanitary principles such as frequent handwashing with soap and water might help in this respect. Consequently, it is critical to pay attention to how children get the majority of their information, what methods should be used to improve awareness in children, and what variables, in addition to the degree of awareness, have influenced their anxiety [48]. According to the findings of a study conducted in the Netherlands, interaction with children by health care workers can decrease anxiety linked with the COVID-19 pandemic in children and its possible harmful effects[43]. Educating parents on how to control their negative emotions is also a crucial step in fostering and sustaining children's mental health in times of crisis. As a
consequence, providing information about COVID-19 disease based on children's cognitive development, health attitudes, and age is essential [48, 49]. Yoga, meditation, exercise, and mental activity can help reduce the anxiety produced by COVID-19, and in order to fight the pandemic, parents and children must work together to diminish the harmful consequences of COVID-19-related anxiety on children's health [50].

In our study, there was a substantial variation in the mean score of children's health based on the kind of insurance coverage. Other research has found that having access to social insurance has a substantial impact on the number of times youngsters visit the doctor [51]. Furthermore, expanding public insurance coverage reduced deprivation at the communal level [52] as well as the financial burden on low-income households [53]. As previous studies have highlighted, this state can help to reduce poverty and inequality in society, as well as impact children's well-being. Children's well-being and health are critical for any society's future[53, 54]. Today's children are our future generation, and their well-being today lays the groundwork for their health during adolescence. Access to health system services, such as health insurance coverage, is a social and economic right, and health planners must plan carefully to enhance justice and equity in this area.

According to the findings of the current study, there is a strong relationship between parents' educational level and their children's health. Other studies have found that parental literacy has an impact on children's health and that it is important to engage in their development in order to enhance children's health[54-56]. Some studies have indicated that women's education levels have an influence on children's health[57], and others have found that maternal and paternal education are equally important in lowering child mortality in Indonesia[56, 58]. In developing countries, fathers generally have a greater level of education than mothers. Therefore education for fathers might be beneficial. Another way to describe the role of fathers' education is the low social position and empowerment of mothers, which has the ability to diminish mothers' influence over child health decisions. Fathers may take a more active part in certain sorts of child health decisions, such as specific measures like immunizations. Mothers, on the other hand, maybe more active in day-to-day decisions concerning public health and nutrition. The father's education has a stronger association with individual health habits, but the mother's education has a greater impact on long-term health indicators like height and weight [59, 60]. Parents with a greater level of education and income, as well as children from higher-income households, are healthier because they have access to higher-quality health care, better nutrition, and better living conditions. This research has underlined the need for increasing parental education via investment.

The current investigation found a strong relationship between the mean score of housing status and cardiac anxiety. Hence, those who lived in leased homes were more anxious. This issue has caused several issues in society. Despite this, research has shown that the coronavirus does not discriminate based on personal residence and affects leased homes just as often as homeowners. [61]. Perhaps the economic crisis caused by the COVID-19 pandemic, as well as issues like unemployment and a lack of financial support for households, has increased anxiety among renters. According to the findings of
previous research, the cost of renting a property in Iran is high [24, 62], which may increase anxiety in leased families indirectly.

The current research was conducted during the pandemic. Due to special circumstances in Iran, such as lockdown, it was not feasible to complete the surveys in person. For that purpose, the surveys were sent to parents over the internet. Another drawback of this study was the use of questionnaires, as there is a risk of bias in self-report instruments. Regarding the aforementioned constraints and the study’s final conclusions, it is proposed that in future studies, further research be performed to clarify the link between variables in other provinces and cities around the country to clarify the relationship between investigated variables. Various aspects related to children’s health, such as parenting and self-care principles, as well as other degrees of anxiety in children should be examined.

**Conclusion**

COVID-19-related anxiety factors have influenced the health of children in Mashhad. As a result, children’s health has deteriorated. Giving them accurate information about the disease and teaching them appropriate coping and survival techniques can help to reduce their fears and anxieties about the COVID-19 pandemic.

**Abbreviations**

COVID-19
Coronavirus Disease 2019;
CH
children’s health;
DAS
Depression, Anxiety, Stress;

**Declarations**

**Acknowledgments**

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**Ethics approval and consent to participate**

The study was approved by the Medical Ethics Committee at the University of Social Welfare and Rehabilitation Sciences in Tehran (IR.USWR.REC.1400.043). All participants were informed about the study and only those providing written informed consent were enrolled in the study.

**Consent to publish**

All participants consented verbally to the publication of the interview data.
Availability of data and materials

The datasets using in the study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' Contributions

All authors were responsible for the study. FNN and MG were responsible for the study Conceptualization and led the paper's writing. AZ, MG and SAA conducted the Literature review and assisted in writing the paper. FA and MMK performed the analysis, assisted in interpreting the data, and writing the paper. FNN, MG and AZ assisted with the interpretation of the results and drafting programmatic Implications. MMK and NM were responsible for the data collection and coordination of the study. AZ co-led the conceptualization, supervised all aspects of writing the paper, and provided extensive comments on the manuscript. All the authors have read and approved the final manuscript.

References

1. Doshmangir L, Mahbub Ahari A, Qolipour K, Azami-Aghdash S, Kalankesh L, Doshmangir P, et al. East Asia's strategies for effective response to COVID-19: lessons learned for Iran. Manag Strategies Health System 2020;4(4):370-3.

2. Azizi MR, Atlasi R, Ziapour A, Abbas J, Naemi R. Innovative human resource management strategies during the COVID-19 pandemic: A systematic narrative review approach. Heliyon 2021;6(12):1-6.

3. Su Z, McDonnell D, Cheshmehzangi A, Abbas J, Li X, Cai Y. The promise and perils of Unit 731 data to advance COVID-19 research. BMJ Glob Health 2021;6(5): e004772.

4. Abbas J, Wang D, Su Z, Ziapour A. The Role of Social Media in the Advent of COVID-19 Pandemic: Crisis Management, Mental Health Challenges, and Implications. Risk Manag Healthcare Policy 2021; 14:1917-32.

5. Abbassi E. Pandemics and politics: Opportunities and Threats of post-Covid-19 Era in Iran. Political Q 2021;51(1):263-90.

6. Abbas J, Mubeen R, Iorember PT, Raza S, Mamirkulova G. Exploring the impact of COVID-19 on tourism: transformational potential and implications for a sustainable recovery of the travel and leisure industry. Current Res Behav Scie 2021; 2:100033.

7. Su Z, McDonnell D, Wen J, Kozak M, Abbas J, Segalo S, et al. Mental health consequences of COVID-19 media coverage: the need for effective crisis communication practices. Glob Health 2021;17(1):4.
8. Yoosefi Lebni J, Abbas J, Moradi F, Salahshoor MR, Chaboksavar F, Irandoost SF, et al. How the COVID-19 pandemic affected economic, social, political, and cultural factors: A lesson from Iran. Int J Soc Psychiatry 2020:20764020939984.

9. WHO. Coronavirus disease (COVID-19) outbreak Accessed 22.12.19. https://www.who.int/westernpacific/emergencies/covid-19. 2019.

10. WHO. coronavirus disease (COVID-19) dashboard. (2020) Accessed 15.05.20. https://covid19.who.int/. 2020.

11. NeJhaddadgar N, Ziapour A, Zakkipour G, Abbas J, Abolfathi M, Shabani M. Effectiveness of telephone-based screening and triage during COVID-19 outbreak in the promoted primary healthcare system: a case study in Ardabil province, Iran. J Public Health. 2020: 1-6. In Press. https://doi.org/10.1007/s10389-020-01407-8

12. Shuja KH, Aqeel M, Jaffar A, Ahmed A. COVID-19 Pandemic and Impending Global Mental Health Implications. Psychiatria Danubina 2020;32(1):32-5.

13. WHO. Director-General’s statement on IHR Emergency Committee on Novel Coronavirus (2019-nCoV). 2019; Available from https://www.who.int/dg/speeches/detail/who-director-general-s-statement-on-ihr-emergency-committee-on-novel-coronavirus-(2019-not, Accessed 30th Jan 2020. 2019.

14. Abbas J. Crisis management, transnational healthcare challenges, and opportunities: The intersection of COVID-19 pandemic and global mental health. Res Glob 2021:100037.

15. Local Burden of Disease HIVC. Mapping subnational HIV mortality in six Latin American countries with incomplete vital registration systems. BMC Med 2021;19(1):4.

16. Wheaton MG, Abramowitz JS, Berman NC, Fabricant LE, Olatunji BO. Psychological predictors of anxiety in response to the H1N1 (swine flu) pandemic. Cognit Therapy Res 2012;36(3):210-8.

17. Su Z, Wen J, Abbas J, McDonnell D, Cheshmehzangi A, Li X, et al. A race for a better understanding of COVID-19 vaccine non-adopters. Brain Behav Immun Health 2020; 9:100159.

18. Mazloomzadeh M, Asghari Ebrahim Abad MJ, Shirkhani M, Zamani Tavousi A, Salayani F. Relationship between Coronavirus anxiety and health anxiety: Mediating role of emotion regulation difficulty. J Clin Psychology 2021:In Press. 10.22075/JCP.2021.1977.2024.

19. Sahu DP, Pradhan SK, Sahoo DP, Patra S, Singh AK, Patro BK. Fear and anxiety among COVID-19 Screening Clinic Beneficiaries of a tertiary care hospital of Eastern India. Asian J Psychiatry 2021;57:102543.

20. Maqsood A, Abbas J, Rehman G, Mubeen R. The paradigm shift for educational system continuance in the advent of COVID-19 pandemic: Mental health challenges and reflections. Current Res Behav Sci 2021;2:100011.

21. Aziziaran S, Basharpoor S. The Role of Rumination, Emotion Regulation and Responsiveness to Stress in Predicting of Corona Anxiety (COVID-19) among Nurses. Q J Nurs Manag 2020;9(3):8-18.

22. Balaratnasingam S, Janca A. Mass hysteria revisited. Current Opinion Psychiatry 2006;19(2):171-4.

23. Kumar A, Somani A. Dealing with Coronavirus anxiety and OCD. Asian J Psychiatry 2020; 51:102053.
24. Farzanegan MR, Gholipour HF. Divorce and the cost of housing: evidence from Iran. Rev Econom Household 2016;14(4):1029-54.

25. Peng EY-C, Lee M-B, Tsai S-T, Yang C-C, Morisky DE, Tsai L-T, et al. Population-based post-crisis psychological distress: an example from the SARS outbreak in Taiwan. J Formosan Med Associat 2010;109(7):524-32.

26. 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.

27. Abbas J. The Impact of Coronavirus (SARS-CoV2) Epidemic on Individuals Mental Health: The Protective Measures of Pakistan in Managing and Sustaining Transmissible Disease. Psychiatria Danubina 2020;32(3-4):472-7.

28. Shuja KH, Shahidullah, Aqeel M, Khan EA, Abbas J. Letter to highlight the effects of isolation on elderly during COVID-19 outbreak. Int J Geriatr Psychiatry 2020;35(12):1477-8.

29. Vameghi R, MARANDI S, Sajedi F, Soleimani F, Shahshahanipour S, Hatamizadeh N, et al. Strategic analysis of the present situation in terms of early childhood development of Iranian children and recommended strategies and activities. Soc Welfare 2010;9(35):397-412.

30. Reutter L, Kushner KE. ‘Health equity through action on the social determinants of health’: taking up the challenge in nursing. Nurs Inquiry 2010;17(3):269-80.

31. Abbas J, Aman J, Nurunnabi M, Bano S. The Impact of Social Media on Learning Behavior for Sustainable Education: Evidence of Students from Selected Universities in Pakistan. Sustainability 2019;11(6):1683.

32. Rahiminejad A, Khodayarifard M, Abedini Y, Paknejad M. Surveying the Relation of Shahid Studentsâ Cognition of Academic Atmosphere, and Their Individual and Family characteristics with Social Compatibility. Clin Psychology Personality 2013;11(2):85-94.

33. Guilamo-Ramos V, Jaccard J, Dittus P, Bouris AM. Parental expertise, trustworthiness, and accessibility: parent-adolescent communication and adolescent risk behavior. J Marriage Fam 2006;68(5):1229-46.

34. Xiang Y-T, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. Lancet Psychiatry.2020;7(3):228-9.

35. Fu W, Yan S, Zong Q, Anderson-Luxford D, Song X, Lv Z, et al. Mental health of college students during the COVID-19 epidemic in China. J affect disorder 2021; 280:7-10.

36. Li Y, Zhao J, Ma Z, McReynolds LS, Lin D, Chen Z, et al. Mental health among college students during the COVID-19 pandemic in China: A 2-wave longitudinal survey. J affect disorder 2021; 281:597-604.

37. Alipour A, Ghadami A, Alipour Z, Abdollahzadeh H. Preliminary validation of the Corona Disease Anxiety Scale (CDAS) in the Iranian sample. Q J Health Psychology 2020;8(32):163-75.

38. Landgraf J, Maunsell E, Speechley KN, Bullinger M, Campbell S, Abetz L, et al. Canadian-French, German and UK versions of the Child Health Questionnaire: methodology and preliminary item scaling results. Q Life Res 1998;7(5):433-45.
39. Drotar D. Measuring health-related quality of life in children and adolescents: Implications for research and practice: Psychology Press; 2014.

40. Golzarpoor M, Ghaedamini Harouni G, Vameghi M, Sajjadi H, Tavangar F. Validity and reliability of Persian version of children's health-related quality of life. J North Khorasan Univ Med Sci 2017;8(3):447-59.

41. Ghaempanah Z, Azadfalah P, Kazem zady Tabatabie R. Standardization and psychometrics characteristics of the Persian version of child health questionnaire (CHQ-PF. 28). J Kermanshah Univ Med Sci 2013;17(7):431-41.

42. Raat H, Botterweck AM, Landgraf JM, Hoogeveen WC, Essink-Bot M-L. Reliability and validity of the short form of the child health questionnaire for parents (CHQ-PF28) in large random school-based and general population samples. J Epidem Commun Health 2005;59(1):75-82.

43. Abawi O, Welling MS, van den Eynde E, van Rossum EF, Halberstadt J, van den Akker EL, et al. COVID-19 related anxiety in children and adolescents with severe obesity: A mixed-methods study. Clin Obesity 2020;10(6):e12412.

44. Lavigne-Cerván R, Costa-López B, Juárez-Ruíz de Mier R, Real-Fernández M, Sánchez-Muñoz de León M, Navarro-Soria I. Consequences of COVID-19 confinement on anxiety, sleep and executive functions of children and adolescents in Spain. Frontier Psychology 2021; 12:334.

45. Ye J. Pediatric mental and behavioral health in the period of quarantine and social distancing with COVID-19. JMIR Pediatr Parent 2020;3(2): e19867.

46. Spinelli M, Lionetti F, Pastore M, Fasolo M. Parents' stress and children's psychological problems in families facing the COVID-19 outbreak in Italy. Frontiers Psychology 2020; 11:1713.

47. Pinar Senkalfa B, Sismanlar Eyuboglu T, Aslan AT, Ramasli Gursoy T, Soysal AS, Yapar D, et al. Effect of the COVID-19 pandemic on anxiety among children with cystic fibrosis and their mothers. Pediatr Pulmonology 2020;55(8):2128-34.

48. Zolfaghari A, Elahi T. Children's level of anxiety in relation to their level of awareness and attitude towards coronavirus based on the health belief model and the level of stress, anxiety, and depression of mothers. J Res Psychological Health 2020;14(1):40-55.

49. McCormack GR, Doyle-Baker PK, Petersen JA, Ghoneim D. Parent anxiety and perceptions of their child’s physical activity and sedentary behavior during the COVID-19 pandemic in Canada. Prevent Med Report 2020; 20:101275.

50. Biradar V, Dalvi P. Impact of COVID19 on Child Health: Parents Perspective. Int J Nurs Educ Res 2020;8(4):463-7.

51. Phillips BA, Conners F, Curtner-Smith ME. Parenting children with down syndrome: An analysis of parenting styles, parenting dimensions, and parental stress. Res Develop Disabil 2017; 68:9-19.

52. Lim S. Mothers’ nonstandard employment, family structure, and children's health insurance coverage. J Fam Econom Issues 2019;40(2):148-64.

53. Adams EK, Johnston EM, Guy G, Joski P, Ketsche P. Children's Health Insurance Program expansions: what works for families? Glob Peditr Health 2019; 6:2333794X19840361.
54. Hamersma S, Kim M, Timpe B. The effect of parental Medicaid expansions on children's health insurance coverage. Contempor Econom Policy 2019;37(2):297-311.

55. Crespo A, Reis M. Child health, household income and the local public provision of health care in Brazil. Citeseer; 2008.

56. Rawlings SB. Parental education and child health: Evidence from an education reform in China. Available in: http://sites.bu.edu/neudc/files/2014/10/paper_360.pdf. 2015;http://sites.bu.edu/neudc/files/2014/10/paper_360.pdf.

57. Cutler DM, Lleras-Muney A. Education, and health: evaluating theories and evidence. National bureau of economic research; 2006.

58. Breierova L, Duflo E. The impact of education on fertility and child mortality: Do fathers matter less than mothers? : National bureau of economic research; 2004.

59. Aslam M, Kingdon GG. Parental education and child health—understanding the pathways of impact in Pakistan. World Develop 2012;40(10):2014-32.

60. Lundborg P, Nilsson A, Rooth D-O. Parental education and offspring outcomes: evidence from the Swedish compulsory School Reform. Am Econom J Applied Econom 2014;6(1):253-78.

61. Ravens-Sieberer U, Kaman A, Erhart M, Devine J, Schlack R, Otto C. Impact of the COVID-19 pandemic on quality of life and mental health in children and adolescents in Germany. European child & adolescent psychiatry. 2021; 25:1-1. In Press. https://doi.org/10.1007/s00787-021-01726-5

62. Kamanroodi M, Jafarpour Ghalehteimouri K. The effect of rent in urban land and housing value and the building violations in Sanandaj city in Iran. Academicus International Sci J 2020;22(13):67-89.