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The effect of the coronavirus (COVID-19) pandemic on health-related quality of life in children

Derya Adıbelli*, Adem Sümen

Akdeniz University Kumluca Health Science, Faculty Department of Public Health Nursing, Antalya, Turkey

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ABSTRACT

Introduction: The study was conducted to examine the effect of the COVID-19 pandemic on health-related quality of life in children.

Materials and methods: The study was conducted with 597 children aged 7–13 and their parents using the online data collection tool via social media. Socio-demographic form and Generic Health-related Quality of Life Questionnaire for Children (Kid-KINDL) were used to collect the data. SPSS 23.0 program, descriptive statistics, Mann-Whitney *U* test and Kruskal-Wallis variance analysis were used to evaluate the data.

Results: During the pandemic, 41.5% of the parents stated that their child gained weight, tendency to sleep of 34.2% and tendency to use the Internet of 69.3% increased. The average self-reported quality of life score of the children was found to be 73.91 ± 8.44. The self-esteem sub-dimension score of the children whose tendency to sleep increased during the pandemic ($p < 0.05$); and the physical well-being ($p < 0.001$), emotional well-being ($p < 0.001$), self-esteem ($p < 0.001$), family ($p < 0.01$), school ($p < 0.05$) sub-dimensions and total ($p < 0.05$) score averages of the children whose tendency to use the Internet were found to be lower. The emotional well-being, family and friends sub-dimensions as well as total average scores of the children of the parents who feel fear/anxiety about coronavirus becoming a pandemic and who stated that lockdown negatively affected their mental health were found to be lower ($p < 0.05$).

Conclusion: Although self-reported quality of life scores of children were generally good, parents reported that their children gained weight, tendency to sleep and internet use increased during the pandemic.

1. Introduction

The novel coronavirus, which was first identified in Wuhan city of China towards the end of 2019, is spreading around the world due to its high spreading capacity as well as high pathogenicity and fatality (Covid-19 Situation Report-93, 2020). Person-to-person transmission can vary depending on the person communicated, age and location (Riou & Althaus, 2020; Chan et al., 2020).

The COVID-19 outbreak put serious strain on the health system of many countries around the world as well as negatively affected their economic and education systems. Although controlling the spread of the virus is a priority in combating the pandemic, the long-term impacts of the pandemic on children's health will be inevitable. Formal education has been suspended and distance education has been conducted due to the COVID-19 outbreak in many countries like United States of America (USA), Italy, United Kingdom, Germany, Spain, Iran, and Turkey. Even short-term closure of schools may exacerbate childhood obesity (Griffiths, 2020; Rundle, Park, Herbstman, Kinsey, & Wang, 2020a). Although there are many written materials addressing the nutrition and physical activity environments in schools from a negative perspective, data show that children gain unhealthy weight especially in holidays but not at school (von Hippel & Workman, 2016; Franckle, Adler, & Davison, 2014; Wang, Vine, Hsiao, Rundle, & Goldsmith, 2015). Since childhood obesity is associated with more weight gain and many chronic diseases in adulthood, unhealthy weight gain in childhood is a long-term source of concern (Rundle et al., 2020b). As a part of the lockdown measures, families stock food with long shelf life buying high-processed and calorie-dense food (Skerritt, Mulvany, & Almeida, 2020). Hence, it is predicted that many children will have high-calorie diets throughout the pandemic. Since sedentary life and the amount of time spent on screen has increased, the data available show that using online video games has increased (Wilde, 2020). In line with these data, the pandemic process is thought to affect the health related quality of life of children.

Health-related Quality of Life (HQL) is expressed as the patient's subjective perception of his/her satisfaction with his/her own health

* Corresponding author.
E-mail addresses: deryaadibelli@akdeniz.edu.tr (D. Adıbelli), ademsumen@akdeniz.edu.tr (A. Sümen).

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and subjective perceptions are directly related to the psychosocial state of the individual. HQL approach has been widely used in the field of adult and child Liaison Psychiatry as an approach that examines the psychosocial consequences of physical health problems (Eser et al., 2008).

Due to the COVID-19 pandemic, children are exposed to excessive information flow as a result of the stress and anxiety of the adults around them and this may lead to incomprehensibility in children (Dalton et al., 2019). It is believed that the fear, anxiety and concern caused by the coronavirus outbreak are quite effective; therefore this will have many psychological and social consequences (Fiorillo & Gorwood, 2020). The uncertainty about the personal and global effects of COVID-19 is creating great concern, in addition to the specific psychological effect of lockdown (Brooks et al., 2020).

This study was conducted to examine the effect of the COVID-19 pandemic on health-related quality of life in children.

In this study, the answers to the following questions were sought:

- Did children experience weight changes as a result of lockdown due to the pandemic? How did this affect the health-related quality of life in children?
- Did children experience an increase in sleep time as a result of lockdown due to the pandemic? How did this affect the health-related quality of life in children?
- Has there been an increase in children's Internet use as a result of lockdown due to the pandemic? How did this affect the health-related quality of life in children?
- How did parents' fear/anxiety because of the pandemic affect children's health-related quality of life?
- How did the working status of parents during the pandemic process affect the children's health-related quality of life?
- How did the parents' application of protection related to the pandemic affect the health-related quality of life in children?
- How did parents' mental health affect children's quality of life during the pandemic process?

2. Materials and methods

2.1. Place and time of the study

This Internet-based cross-sectional study was conducted between March 30 and April 20, 2020 in Turkey. Since there was a lockdown at the time of data collection and this research was conducted on the Internet, parents using social media across the country were included in the study.

2.2. Study population and sample

As per COVID-19 pandemic measures, the study was conducted using online data collection tool via social media. Thus, all the parents who have children aged 7–13 and using social media, and their children within the country constituted the study population while 597 participants who were accessible and filled the data collection tools constituted the study sample. Each parent and his/her child were considered as one participant (597 parents and 597 children). G-Power statistical analysis program was used in the power analysis of the study sample (G*Power 3.1.9.4). In the Post-Hoc analysis conducted to determine the sample power, it was found that the sample provided “a 91% power in 95% confidence interval with an effect size of 2.5%”.

2.3. Collection of data and data collection tools

To overcome the problem of common method bias firstly selection bias was eliminated. Since the data collection process was completely online due to the pandemic, the online tool was sent to social media groups. There was participation from different geographical regions and provinces across the country. Voluntary parents and children who wanted to participate were informed with detailed information and consent text attached to beginning the online data collection tool. Those who gave approval to participate were able to answer the questions. Socio-demographic form (parent and child data) and Generic Health-related Quality of Life Questionnaire for Children (Kid-KINDL) for ages of 7–13 were used to collect the data.

2.3.1. Socio-demographic form

It consists of two parts. The form consisted of 20 questions in total, in the first part there were 15 questions containing parent data. Socio-demographic information of parents, whether they are a healthcare worker, how they evaluate their health, presence of chronic disease, presence of fear/anxiety about coronavirus, where they follow information about coronavirus, compliance with protection, working status during the pandemic process, at home during the pandemic the effect of being on mental health has been questioned. There were five questions containing information about the child in the second part. Socio-demographic information of children, change in body weight, increase in sleep time and increase in Internet use during the pandemic process were questioned. Parents’ information and opinion is required for data on children’ weight change, sleep time and Internet usage in the form. Therefore, the entire form was answered by the parent.

2.3.2. Generic health-related quality of life questionnaire for children (Kid-KINDL) for ages of 7–13

KINDL (KINDer Lebensqualitätsfragebogen: Children Quality of Life-Questionnaire) which was developed by Ravens-Sieberer and Bullinger (1998), is a tool to measure the health-related quality of life for generic purpose specific to children and adolescents. KINDL which was originally in German was translated in 14 different languages. It was adopted for our country by Eser et al. (2008). The Kid-KINDL questionnaire which was answered by the children consisted of 24 items containing five-point ordinal response options. The scale includes six dimensions such as physical well-being, emotional well-being, self-esteem, family, friends and school (school or kindergarten/nursery where daily activities are performed) and one illness module. Each sub-dimension consists of four items while module consists of six items. The dimension scores are calculated separately and the total health-related quality of life score is obtained by combination of these six dimensions (except the illness module). The KINDL can be used in both clinical and nonclinical areas, and both in healthy children and children with chronic illness. The Kid-KINDL is a Likert type measuring tool containing items from 1 (never) to 5 (always). According to the wording of the question, the negative oriented items (the questions 1, 2, 3, 6, 7, 8, 15, 16, 20 and 24) were scored reversely. The score is calculated by counting the points given to the items for each dimension, then translation of them into a scalable form between 0 and 100 and finally summarizing. The scale does not have a cut point. The Cronbach alpha value for the entire original scale is 0.95 while it is 0.89 in this study.

2.4. Data analysis

Data was evaluated in the SPSS 23.0 program, and analyzed using descriptive statistics, Mann-Whitney *U* test and Kruskal-Wallis variance analysis. Normal distribution was evaluated with Kolmogorov-Smirnov test and non-parametric tests were used in the analysis of the numerical variables that did not show normal distribution. The cases where the type 1 error level was below 5% were evaluated as statistical significance.

2.5. Ethical principles

Informed consent was obtained from the parents beginning of the online tool for their participation in the study. Ethical approval was obtained from XXX University Clinical Research Ethics Committee (No:

Table 1
Distribution of some characteristics of the parents of the children included in the study (n: 597).

Characteristics	n	%
Age	(Min: 26 - Max: 57)	37.63 ± 5.83
Gender		
Female	491	82.2
Male	106	17.8
Marital status		
Married	571	95.6
Single	26	4.4
Number of children		
1	70	11.7
2	345	57.8
3	154	25.8
4 and above	28	4.7
Educational status		
Primary education	199	33.3
High school	192	32.2
Undergraduate	186	31.2
Post-graduate	20	3.4
Income status		
Revenue is less than expenses	189	31.7
Revenue is equal to expenses	311	52.1
Revenue is more than expenses	97	16.2
Being a healthcare professional		
Yes	21	3.5
No	576	96.5
Having a family member who is a healthcare professional		
Yes	48	8.0
No	549	92.0
Health perception		
Moderate	220	36.9
Good	377	63.1
Having a chronic illness		
Yes	85	14.2
No	512	85.8

KAEK-330). Legal permission was obtained to carry out the research from the Ministry of Health of the Republic of Turkey (T11_17_36). The study was conducted in accordance with the Declaration of Helsinki principles (revised in Brazil in 2013). Permission was taken from the researchers who adopted the scale.

3. Results

82.2% of the participants of the study was female, 95.6% was married and more than the half had two children (57.8%) and the average age was 37.63 ± 5.83. 33.3% of the parents were identified to be primary school graduate, 32.2% was high school graduates, and incomes of 52.1% were equal to their expenses. 3.5% of the parents was stated that he/she was a healthcare professional while 8.0% stated that there was one healthcare professional in their family. More than the half of the parents perceived their health good (63.1%) while 14.2% was found to have at least one chronic disease (Table 1).

Regarding the coronavirus outbreak, it was found that 79.7% of the relevant parents were afraid of/anxious while 76.0% follow the information provided by the Ministry of Health and other government agencies. Almost all of the parents (96.6%) stated that they considered and followed the warnings to be protected from the coronavirus and 51.3% was stated that they did not work during the outbreak. 45.4% of the parents stated that lockdown due to the coronavirus outbreak negatively affected their mental health (Table 2).

55.8% of the children aged 7–13 in the study was female, 44.2% was male and the average age was 9.87 ± 1.99. 2.8% of the parents stated that their child had a long lasting disease. 41.5% of the parents stated that their child gained weight, 34.2% stated that their child tendency to sleep increased and 69.3% stated that their child Internet use increased as a result of lockdown due to the coronavirus outbreak (Table 3).

Table 2
Distribution of some characteristics of the parents related to the coronavirus outbreak (n: 597).

Characteristics	n	%
Fear/anxiety about coronavirus becoming a pandemic		
Yes	476	79.7
No	121	20.3
Information source for the outbreak		
Social media	123	20.6
Healthcare professionals	20	3.4
The Ministry of Health and other government agencies	454	76.0
Considering and implementing the warnings for protection		
Yes	577	96.6
No	20	3.4
Continuation of working/business life		
Not working	306	51.3
Continues working	119	19.9
Started working from home	66	11.1
Had a break from work, does not continue	106	17.8
Effect of staying at home due to outbreak on mental health		
Positive	99	16.6
Negative	271	45.4
No effect	227	38.0

Table 3
Distribution of some characteristics of the children included in the study (Parents' responses) (n: 597).

Characteristics	n	%
Age	(Min: 7 - Max: 13)	9.87 ± 1.99
Gender		
Female	333	55.8
Male	264	44.2
Presence of a long lasting disease		
Yes	17	2.8
No	580	97.2
Parents' reported change in weight as a result of lockdown due to the pandemic		
Yes, he/she gained weight	248	41.5
Yes, he/she lost weight	22	3.7
Did not change	327	54.8
Parents' reported increase in sleep as a result of lockdown due to the pandemic		
Yes	204	34.2
No	393	65.8
Parents' reported increase in Internet use as a result of lockdown due to the pandemic		
Yes	414	69.3
No	183	30.7

The average self-reported quality of life score of the children participated in the study was found to be 73.91 ± 8.44. Given the Kid-KINDL sub-dimensions, it was determined that the highest average score were 84.03 ± 11.81 for the "physical well-being" and 82.42 ± 11.76 for the "family" while the lowest average score were 56.77 ± 16.39 for the "friends" and 59.51 ± 19.11 for the "self-esteem" (Fig. 1).

Given the self-reported quality of life scale scores of the children for some characteristics, it was determined that the self-esteem $p < 0.01$), school ($p < 0.001$) sub-dimensions and total ($p < 0.05$) average scores of the children aged 10 and below; the sub-dimension average scores for the family ($p < 0.05$) for the girls and friends for the boys ($p < 0.05$); the physical well-being ($p < 0.001$), emotional well-being ($p < 0.05$), family ($p < 0.01$) sub-dimensions and total average scores ($p < 0.01$) of those with no change in their weight throughout the lockdown were higher. The self-esteem sub-dimension score of the children whose tendency to sleep increased as a result of lockdown due

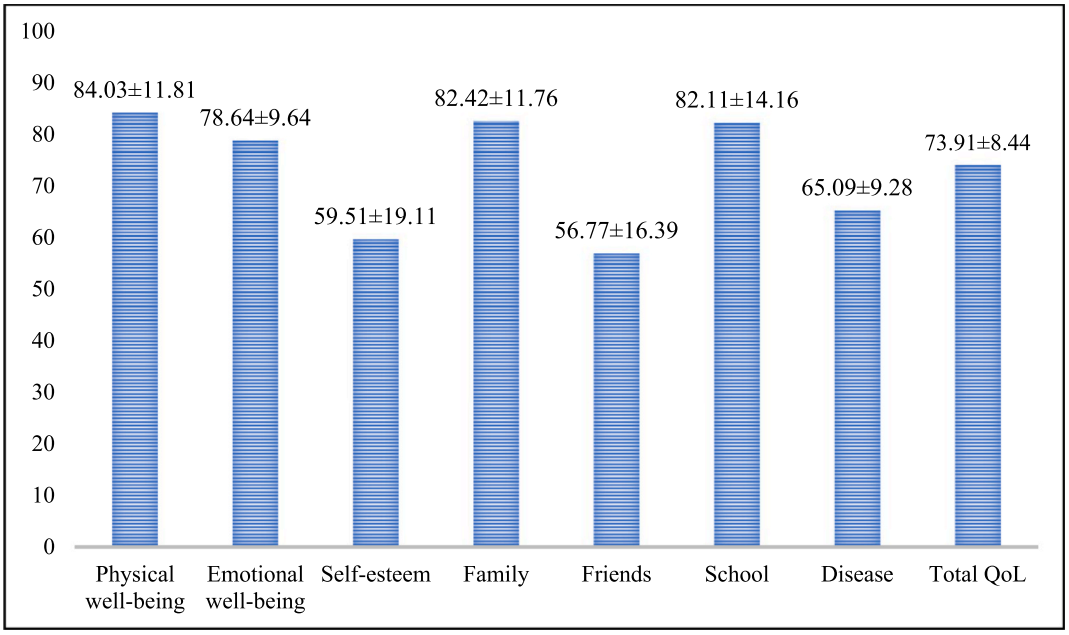

Fig. 1. Distribution of total and sub-dimension average scores of Generic Health-related quality of life questionnaire for children (n: 597).

Table 4
Comparison of the Generic Health-related Quality of Life Questionnaire for Children scores according to certain characteristics of children (n: 597).

Characteristics		Physical well-being X ± SD	Emotional well-being X ± SD	Self-esteem X ± SD	Family X ± SD	Friends X ± SD	School X ± SD	Total QoL X ± SD
Age	10 and below	84.74 ± 11.63	78.53 ± 9.67	61.25 ± 19.55	82.30 ± 11.48	56.70 ± 16.64	83.83 ± 14.04	74.56 ± 8.25
	11 and above	82.71 ± 12.06	78.84 ± 9.61	56.25 ± 17.83	82.64 ± 12.28	56.89 ± 15.96	78.91 ± 13.86	72.71 ± 8.68
	z	−1,825	−0,605	−2,954	−0,848	−0,241	−4,346	−2,317
	p	0,068	0,545	**0.003****	0,397	0,809	**0.000*****	**0.020***
Gender	Female	84.23 ± 11.84	78.82 ± 10.14	60.16 ± 19.42	83.30 ± 12.04	55.58 ± 16.43	81.75 ± 14.29	73.97 ± 8.99
	Male	83.78 ± 11.79	78.40 ± 8.99	58.69 ± 18.71	81.30 ± 11.31	58.27 ± 16.25	78.91 ± 14.00	73.84 ± 7.72
	z	−0,589	−1,211	−1,435	−2,499	−2,157	−0,791	−0,638
	p	0,556	0,226	0,151	**0.012***	**0.031***	0,429	0,524
Parents' reported change in weight as a result of lockdown due to the pandemic	Yes, he/she gained weight	83.02 ± 12.42	77.23 ± 11.11	57.66 ± 20.81	82.35 ± 12.02	55.72 ± 16.81	81.93 ± 14.01	72.99 ± 9.27
	Yes, he/she lost weight	75.45 ± 11.22	77.27 ± 5.50	60.45 ± 21.76	73.18 ± 12.77	56.36 ± 8.47	80.00 ± 13.09	70.45 ± 4.12
	Did not change	85.38 ± 11.07	79.80 ± 8.45	60.85 ± 17.44	83.08 ± 11.25	57.59 ± 16.46	82.40 ± 14.36	74.85 ± 7,864
	x^2	17,164	9,128	3,632	10,593	2,152	1,109	11,071
	p	**0.000*****	**0.010***	0,163	**0.005****	0,341	0,574	**0.004****
Parents' reported increase in sleep as a result of lockdown due to the pandemic	Yes	84.31 ± 11.26	77.89 ± 10.05	57.03 ± 19.18	81.59 ± 13.07	57.00 ± 15.45	81.00 ± 13.66	73.14 ± 8.72
	No	83.89 ± 12.10	79.03 ± 9.41	60.80 ± 18.96	82.84 ± 11.00	56.65 ± 16.88	82.69 ± 14.39	74.32 ± 8.28
	z	−0,287	−1,101	−2,286	−0,870	−0,554	−1,749	−1,840
	p	0,774	0,271	**0.022***	0,384	0,579	0,080	0,066
Parents' reported increase in Internet use as a result of lockdown due to the pandemic	Yes	82.17 ± 12.32	77.24 ± 9.53	57.70 ± 18.91	81.50 ± 11.32	55.76 ± 15.15	81.52 ± 13.65	72.65 ± 7.93
	No	88.25 ± 9.31	81.80 ± 9.17	63.60 ± 18.96	84.48 ± 12.47	59.07 ± 18.75	83.46 ± 15.20	76.78 ± 8.88
	z	−5,503	−5,532	−3,548	−3,300	−1,845	−2,135	−5,605
	p	**0.000*****	**0.000*****	**0.000*****	**0.001****	0,065	**0.033***	**0.000*****

z: Mann Whitney *U* test, x^2: Kruskal Wallis-H test, *p < 0.05, **p < 0.01, ***p < 0.001.

to the pandemic (p < 0.05); and the physical well-being (p < 0.001), emotional well-being (p < 0.001), self-esteem (p < 0.001), family (p < 0.01), school (p < 0.05) sub-dimensions and total (p < 0.05) score averages of the children whose tendency to use the Internet were found to be lower (Table 4).

It was found out that the emotional well-being (p < 0.001), family (p < 0.01), friends (p < 0.05) sub-dimensions and total (p < 0.001) average scores of the children of the parents who feel fear/anxiety about coronavirus becoming a pandemic were lower and the school (p < 0.01) sub-dimension average score of those who follow the news about coronavirus from the social media were higher. It was seen that the physical well-being (p < 0.01), emotional well-being (p < 0.01), self-esteem (p < 0.001), school (p < 0.01) sub-dimensions and total (p < 0.001) average scores of the children of the parents who did not work throughout the outbreak were higher while the family sub-dimension average score (p < 0.05) of those who had a break from work were lower (p < 0.05). The self-reported quality of life total and sub-dimension average scores of the children of the parents who stated that lockdown due to the outbreak negatively affected their mental well-being were found to be lower p < 0.05) (Table 5).

Table 5
Effect of some characteristics of parents regarding the coronavirus outbreak on the Generic Health-related Quality of Life Questionnaire for Children scores (n: 597).

Characteristics		Physical well-being X ± SD	Emotional well-being X ± SD	Self-esteem X ± SD	Family X ± SD	Friends X ± SD	School X ± SD	Total QoL X ± SD
Fear/anxiety about coronavirus becoming a pandemic	Yes	83.63 ± 12.00	77.80 ± 9.75	58.80 ± 18.91	81.77 ± 11.52	55.92 ± 16.05	81.62 ± 14.44	73.26 ± 8.39
	No	85.61 ± 10.96	81.94 ± 8.47	62.31 ± 19.70	84.95 ± 12.37	60.12 ± 17.35	84.04 ± 12.85	76.50 ± 8.17
	z	−1,577	−4,330	−1,432	−3,084	−2,537	−1,470	−3,940
	p	0,115	**0.000*****	0,152	**0.002****	**0.011***	0,141	**0.000*****
Information source for the outbreak	Social media	84.10 ± 12.94	77.64 ± 8.50	58.69 ± 18.91	80.08 ± 12.54	57.03 ± 15.77	86.17 ± 12.23	73.95 ± 7.60
	Healthcare professionals	87.50 ± 10.32	80.00 ± 9.45	63.00 ± 12.60	83.00 ± 11.51	63.00 ± 15.76	79.50 ± 9.58	76.00 ± 7.73
	The Ministry of Health and other government agencies	83.86 ± 11.55	78.85 ± 9.93	59.58 ± 19.41	83.02 ± 11.49	56.43 ± 16.56	81.13 ± 14.62	73.81 ± 8.69
	x^2	2,905	1,028	1,104	5,012	3,153	12,274	0,906
	p	0,234	0,598	0,576	0,082	0,207	**0.002****	0,636
Considering and implementing the warnings for protection	Yes	83.89 ± 11.75	78.60 ± 9.52	59.42 ± 19.10	82.35 ± 11.59	56.69 ± 16.42	82.02 ± 14.18	73.83 ± 8.37
	No	88.00 ± 13.21	79.75 ± 12.92	62.00 ± 19.49	84.25 ± 16.16	59.00 ± 15.77	84.75 ± 13.42	76.29 ± 10.33
	z	−1,824	−0,560	−0,705	−0,879	−0,743	−0,768	−1,708
	p	0,068	0,575	0,481	0,379	0,458	0,443	0,088
Continuation of working/business life	Not working	85.11 ± 11.41	79.95 ± 8.24	62.74 ± 19.65	81.74 ± 11.50	57.84 ± 16.80	83.79 ± 13.67	75.19 ± 8.17
	Continues working	85.08 ± 12.67	78.73 ± 10.50	57.01 ± 20.30	84.95 ± 11.30	57.18 ± 15.49	82.98 ± 13.50	74.32 ± 7.56
	Started working from home	82.42 ± 11.30	77.57 ± 11.17	57.72 ± 14.88	84.09 ± 9.64	55.15 ± 15.41	77.72 ± 16.08	72.44 ± 9.03
	Had a break from work, does not continue	80.75 ± 11.70	75.42 ± 10.64	54.10 ± 16.75	80.47 ± 13.60	54.24 ± 16.64	79.05 ± 14.14	70.67 ± 8.89
	x^2	15,430	15,888	21,972	8,424	5,154	13,897	21,622
	p	**0.001****	**0.001****	**0.000*****	**0.038***	0,161	**0.003****	**0.000*****
Effect of staying at home due to outbreak on mental health	Positive	85.05 ± 12.88	82.62 ± 9.40	65.35 ± 20.76	86.26 ± 12.46	58.48 ± 17.06	81.81 ± 15.54	76.59 ± 8.53
	Negative	82.01 ± 11.94	75.57 ± 10.27	56.75 ± 18.29	79.55 ± 12.26	53.76 ± 15.40	80.22 ± 14.04	71.31 ± 8.33
	No effect	86.01 ± 10.79	80.57 ± 7.67	60.26 ± 18.74	84.16 ± 9.92	59.62 ± 16.69	84.51 ± 13.35	75.85 ± 7.64
	x^2	15,773	49,035	15,343	30,862	17,161	12,301	52,785
	p	**0.000*****	**0.000*****	**0.000*****	**0.000*****	**0.000*****	**0.002****	**0.000*****

z: Mann Whitney *U* test, x^2: Kruskal Wallis-H test, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

4. Discussion

In this study, the effect of the coronavirus outbreak on the health-related quality of life of children was investigated. However, the results were discussed in conjunction with the literature available since the current pandemic still continues across the world and the number of studies examining its effects on children was limited.

In the study, most of the parents report feeling fear and anxiety about the coronavirus outbreak and most of them follow the news about the pandemic from the Ministry of Health and other government agencies. Almost all of the parents stated that they followed the protection measures carefully and approximately half of them stated that lockdown due to the pandemic negatively affected their mental health. It is believed that the fear, anxiety and concern caused by the coronavirus outbreak are quite effective; therefore this will have many psychological and social consequences in almost all age groups (Fiorillo & Gorwood, 2020). As per the protection measures, it is thought that lockdown has increased the use of the Internet throughout the society and there is a constant flow of information about the pandemic in many sharing/news websites. In line with the study results, following the news from the government agencies may help to effectively cope with this process. In many countries, passivation of the social life which was active before the pandemic, experiencing work losses and thus financial difficulties negatively affected people's mental health (Fiorillo & Gorwood, 2020). The psychological breakdown in the society has also triggered the domestic violence (Godin, 2020; Women's Aid UK, 2020; Gupta, 2020). A virus that emerges from a source and spreads rapidly affects many social dimensions besides the health.

In the study, it was found that half of the parents reported that their child had gained weight and their tendency to sleep increased in the process of coronavirus outbreak. In many countries combating with the COVID-19, formal education has been suspended and education has been conducted online (Griffiths, 2020; Rundle et al., 2020a). In a study, it was found that school closures reduced COVID-19 mortality, as it would reduce the number of cases among children (Bayham & Fenichel, 2020). Tendency to gain weight may have increased since the mobility of children who are physically active in school environment decreased as a result of lockdown measure and energy balance was impaired due to the failure of burning calories from foods. However, it is believed that parents stocking food with long shelf life that are highly processed to delay the decay and are calorie-intense may have increased the tendency of gaining weight in children (Skerritt et al., 2020). Gym should be prioritized with the developing remote education capacities of schools. Schools can support children in physical activities by sending also home exercise schedules for physical activities besides the fundamental courses (Rundle et al., 2020a). In the study, more than half of the parents stated that Internet usage increased in their children. This result might be caused by several reasons like conducting the education on the Internet in home environment, children having so many spare time in this period and performing limited activities with the family thus children tend to spend their time on Internet more.

The average self-reported quality of life score of the children participated in the study was found to be 73.91 ± 8.44. Given the scale sub-dimensions, it was determined that the highest average score were 84.03 ± 11.81 for the "physical well-being" and 82.42 ± 11.76 for the "family" while the lowest average score were 56.77 ± 16.39 for the "friends" and 59.51 ± 19.11 for the "self-esteem". In a study, the average quality of life score of children (Kid-KINDL) was determined as 67.82 ± 1.93 (Pakpour et al., 2019) and as 75.59 ± 10.18 in another study where the same measuring tool was used (Lee, Lin, Tsai, Strong, & Lin, 2016). Since the scale does not have a cut point, high average scores (score range is 0–100) show that the children's self-reported quality of life is high. In this context, the scores obtained in this study show that children's quality of life is good. Quality of life in children is an important concept involving both objective and subjective evaluations. When the pandemic period is considered, being in home environment even closed may have made the children feel good.

In the study, the physical well-being, emotional well-being, family and total scores of the children whose weight did not change during lockdown were found to be higher. The physical well-being, emotional well-being, self-esteem, family, school and total scores of the children whose Internet use increased were found to be lower. Children have been exposed to sedentary life inside their homes upon the closure of schools within the scope of the social isolation measures. It has been observed that spending the entire day at home has caused events and activities to be directed mostly to screen-oriented applications. From the public health perspective, sedentary life and weight gain may lead to several chronic diseases in children in post-pandemic period. Screen addiction, as one of the long-term effects of the pandemic, may cause significant psychosocial problems in children, teens and adults. In the study, the self-esteem scores of the children whose parents reported tendency to sleep increased as a result of lockdown were found to be lower. In a study, all the sub-dimension scores in the Kid-KINDL quality of life scale were found to be lower in children with sleep disorder (Koyuncu, Arslantaş, & Ünsal, 2013). It is believed that the fact that children have too much spare time in home environment during the day and that they do not have to wake up early in the morning due to the closure of the schools has increased the tendency to sleep.

The emotional well-being, family, friends and total scores of the children of the parents who feel fear/anxiety about coronavirus becoming a pandemic were found to be lower. Listening to what children believe about COVID-19 is essential; providing children with an accurate explanation that is meaningful to them will ensure that they do not feel unnecessarily frightened or guilty. Studies show that even children younger than two years notice the changes around them (Stein, Lehtonen, Harvey, Nicol-Harper, & Craske, 2009). Since the understanding of children develops in childhood and adolescence; when adults talk to children, the information provided needs to take into account the child's age and level of understanding. Sensitive and effective communication about life-threatening illness has major benefits for children and their family's long term psychological wellbeing (Stein et al., 2009). Normalizing their emotional reactions and reassuring children about how the family will look after each other helps to contain anxiety and provides a shared focus (Dalton, Rapa, & Stein, 2020). In environments where children feel fear and anxiety, playing games or performing creative activities like drawing may ease this period. The daily routines of a child should be maintained as far as possible (WHO, 2020a,b).

The physical well-being, emotional well-being, self-esteem, school and total scores of the children whose parents did not work throughout the pandemic were higher while the family scores of the children whose parents had a break from work were lower. Working from home, if possible, may be an ideal method during the pandemic. At home, one can carry out their own business as well as effectively spend their remaining time with their family. The finding that the children such parents have higher well-being scores support this point. In addition, those had a break from work face financial difficulties. Lower family scores of the children whose family is in this situation may be due to financial concerns and difficulties.

The self-reported quality of life total and sub-dimension scores of the children of the parents who stated that lockdown due to the outbreak negatively affected their mental well-being were lower. Since the society has gotten used to social isolation during the pandemic, quitting from this habit will not be easy in the post-pandemic period. People's fear of being infected may lead to the continuation of the social isolation and they may intend to protect their children. However, it can be a constructive process for children provided that the time spent with the family in the home environment is utilized effectively during the period when the schools are closed. In family environments where both parents work, especially where family members find it difficult to allocate time to each other, joint family games and activities are believed to support children to be less affected by this process.

5. Conclusion

The coronavirus outbreak causes fear and anxiety in society. Parents stated that their children gained weight, their tendency to sleep and their Internet use increased due to the pandemic. Although the self-reported quality of life scores of children were generally good, the quality of life total and sub-dimension scores of the children of the parents who feel fear/anxiety about coronavirus becoming a pandemic and who stated that lockdown due to the outbreak negatively affected their mental well-being were lower. Accordingly, it is believed to be beneficial that;

- Parents ensure that children perform physical activities (online exercises) and have a sufficient and balanced diet,
- Parents ensure that children sleep at a certain time and do not get up late in the morning every day,
- Parents permit to use Internet within certain hours during the day and collaboration with children is ensured in this regard,
- It is believed that talking about the pandemic and informing the child about actions to take in line with the development phase of the child will be beneficial.
- Unreliable sources of information can also increase the stress level of parents, thus fear and anxiety. Due to the risk of accurate and outdated information spreading very quickly on social media and the Internet, it may be more useful to follow the information provided by formal institutions in this process.

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CRediT authorship contribution statement

Derya Adibelli: Conceptualization, Methodology, Software, Data curation. **Adem Sümen:** Methodology, Software, Data curation, Supervision, Validation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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