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Oral health practice and health-related quality of life of a group of children during the early stage of the COVID-19 pandemic in Istanbul

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Abstract:

BACKGROUND: During the pandemic period of coronavirus disease, appropriate oral health management and disease prevention of children are very important for children's oral and general health. The aim of this study was to survey to better understand in children's dental health and dietary habits and to learn about parents' attitudes toward dental treatment and clinical factors associated with their QoL using the Turkish version of KIDSCREEN-10 during the initial stage of the COVID-19 pandemic in the general public.

MATERIALS AND METHODS: A two-part questionnaire, namely Part 1 addressed topics regarding changes in general and dental health, dietary habits of children under quarantine, and sociodemographic characteristics of the family and Part 2 impact of QoL was assessed by the KIDSCREEN-10 scale with 10 questions. The questionnaire was sent online using WhatsApp to a convenience sample of mothers with children between the age group of 8 and 18 years, who lived in Istanbul. Variables were statistically analyzed using the Student's *t*-test for independent samples and Univariate F-test, ANOVA according to the characteristics of variables which were analyzed.

RESULTS: This study included 328 from 557 mothers with 58% respondent rate. The consumption of fast food, packaged food, and carbonated beverages decreased during the COVID-19 outbreak. Half of the mothers of children reported that they were anxious or fearful about their children visiting dentists during the pandemic and 64.2% of the children missed routine dental visits. The KIDSCREEN-10 scores for 13 years old or older children were influenced more by the COVID-19 pandemic than those for the 8–12 years old, who had a better QoL ($P = 0.008$).

CONCLUSIONS: The results of this study emphasize the importance of oral health and QoL of children during the initial phase of the COVID-19 outbreak. The general perception of QoL in this group of Turkish children seemed to be substantially affected by COVID-19 outbreak.

Keywords:

COVID-19, health-related quality of life, oral health

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Introduction

Coronavirus is a most important pathogen which affects the human respiratory tract and other parts of the body. Prior to the current COVID-19 pandemic, coronavirus outbreaks, constituting a serious public health threat, have occurred. They include severe acute respiratory syndrome (CoV) and

Middle East Respiratory Syndrome (CoV).^[1] The current pandemic started at the end of December 2019, when a group of patients with unknown etiology and a diagnosis of pneumonia were hospitalized.^[2]

The main symptoms of COVID-19 are: Fever, cough, vomiting, diarrhea, and loss of taste and smell.^[3] On March 11, 2020, the current epidemic was declared as a

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pandemic.^[4,5] In Turkey, since March 16, 2020, children have not been allowed to attend schools and distance education programs have taken place so that all students can attend classes through online platforms.

During the pandemic period of coronavirus disease, appropriate oral health management and disease prevention are very important for children's oral and general health. In order to prevent the occurrence of cross-infection and the spread of COVID-19, good oral health must be maintained through effective tooth-brushing and a good diet to prevent oral diseases and the need for emergency dental care.

Parents should ensure children's good oral hygiene and diet from an early age, guiding, supervising or assisting children in oral health management, and disease prevention to avoid oral and other diseases.^[6] During the COVID-19 pandemic, the task of parents is to regulate their children's diets in a reasonable way to avoid eating high-sugar containing foods at high frequency. In addition, there may be a tendency for trauma to the teeth to increase as children need to play during the epidemic at home.^[7]

The KIDSCREEN-10 demonstrated good internal reliability. Cronbach's alpha values of the child versions were 0.82, whereas proxy versions' alpha values were 0.525 for KIDSCREEN-10 Turkish version scale. The ICC values that indicate consistency with test retest assessments of a group of respondents-resulted ICC values was 0.79 for the Turkish version of KIDSCREEN-10.^[8] The aim of this study was to survey to better understand in children's dental health and dietary habits and to learn about parents' attitudes toward dental treatment during the initial stage of the COVID-19 pandemic in the general public. The study also assessed demographic and clinical factors associated with the children QoL, using the Turkish version of KIDSCREEN-10. The data will be used for future reference.

Materials and Methods

Study design and setting

This cross-sectional study was carried out on May 2020 and was advertised to a convenience sample of 557 mothers of children aged between the age group of 8 and 18 years, who lived in Istanbul and were friends or colleagues of the authors, through social media using WhatsApp. The posting on WhatsApp explained the nature of the study and stated that respondents would not be identified by name in any paper or presentation which resulted from the study. In the posting, parents were also advised that completion of the questionnaires would be taken as indicating consent

to take part in the study. The WhatsApp message included a link to a two-part questionnaire which was placed on Survey Software (Google Forms https://docs.google.com/forms/d/e/1FAIpQLSfkrXJzW_T8oSFDCIbNalPJmSvCHPPIWLADtxaHxL1Du_Fqpw/viewform?usp=sf_link).

The questionnaire comprised two sections: The first part with 27 questions addressed topics regarding in children's sociodemographic information and children's oral health-related habits [Figure 1]. The second part incorporated the Turkish version of KIDSCREEN-10 scale with 10 questions [Figure 2].

In the first part, the questions related to general and oral dental health, eating patterns of children during quarantine, and the sociodemographic characteristics of the family concerned. It also included sociodemographic variables such as age, gender, and mother's education level (coded as primary, high school bachelor graduate, master, and PhD) mother's job and whether or not it was related to health care; dental visit history, children's tooth-brushing and dietary habits [Figure 1]. The second part [Figure 2] investigated HRQoL using KIDSCREEN-10 which is a short version of the KIDSCREEN-27 questionnaire. Answers were rated on a 5-point Likert scale ranging from "Not at all" to "Extremely."^[9] The KIDSCREEN-10 index includes physical, psychological, and social components, and the 10 questions, with Likert scales for responses, yield an overall HRQoL score.^[10] The answers are based on the previous week. Unlike other HRQoL instruments, the KIDSCREEN-10 index measures both positive and negative aspects of life.^[11] Eight questions are

Part 1

- Your child's age?
- Your child's gender? Girl Boy
- Your education level? Primary School High School Undergraduate Postgraduate
- Do you go to work during the quarantine process? Yes No
- Is there an individual in your family diagnosed as positive for covid-19? Yes No
- If so, how was the patient's treatment course? Light Medium Heavy

We ask you to evaluate the questions below with your experiences during the quarantine process;

- Does your child continue to brush their teeth regularly? Yes No
- Do you accompany your child to brush their teeth? Yes No
- Previously, did you accompany your child's teeth brushing? Yes No
- Have your regular dental checkups been disrupted? Yes No
- Do you cook yourself at home? Yes No
- When cooking for your children, do you pay more attention to being nutritious? Yes No
- Do you pay more attention to prevent caries while cooking for your children? Yes No
- Has your child's fast food consumption decreased? Yes No
- Has your child's consumption of sugary/carbonated drinks decreased? Yes No
- Has your child's consumption of packaged foods decreased? Yes No
- Does your child drink water more regularly? Yes No
- Has the frequency of your child's fruit consumption increased? Yes No
- Has your child's vegetable consumption increased? Yes No
- Does your child use electronic devices (tablet, phone, TV, computer) more while eating or snacking? Yes No
- Have you had to visit the dentist for your child? Yes No
- What was the reason if you had to? Routine control Toothache Swelling of the face Trauma Apparatus control
- Are you worried about getting your child dental treatment? Yes No
- Do you think your child could be infected with covid-19 during dental treatment? Yes No
- Do you know that dentists need to take additional protective measures (such as protective glasses, masks, overalls, etc.)? Yes No
- Have you had to use digital platforms (phone, computer, photo) to reach your dentist? Yes No
- Do you arrange the physical activities performed at home in a way that does not cause dental injuries to your children? Yes No

Figure 1: Questionnaire Part 1: Children's socio demographic information and children's oral health-related behaviours

formulated positively, whereas questions three and four are formulated negatively. These two questions must be reverse scored, as higher values always indicate higher HRQoL. Scores can be transformed to a 0–100 scale, with 100 being the highest score. The KIDSCREEN-10 demonstrated good internal reliability. Cronbach's alpha values of the child versions were 0.82, whereas proxy versions' alpha values were 0.525 for KIDSCREEN-10 Turkish version scale. The ICC values that indicate consistency with test retest assessments of a group of respondents resulted ICC values was 0.79 for the Turkish version of KIDSCREEN-10.^[8] The two-part questionnaire took about 10 min to complete. Children with scores of over 65 years were considered to have good to high HRQoL and students with a score of 65 or less were seen as having low HRQoL.

Data analysis

Questionnaires with missing demographic data (education and income) were excluded from the analyses. Mean KIDSCREEN-10 index scores were computed. Variables were statistically analysed using the Student's *t*-test for the independent samples and Univariate F-test, ANOVA according to the characteristics of variables which were analyzed. The results are presented as mean differences with 95% confidence intervals and *P* values.

Ethical consideration

Ethics approval for the study was obtained from Marmara University Faculty of Dentistry Clinical Researches Ethics Committee (2020–2017), and written consent was obtained from Ministry of Health of Turkey (2020-05-09T21_34_00).

Results

Out of the 557 mothers, contacted by WhatsApp, 328 completed the questionnaire, giving a response rate of 59%. The mean age of the children was 11.03 ± 2.79 years, of whom 170 (51.8%) were girls, with a mean age of 10.93 ± 2.84 years and 158 (48.2%) were boys, with a mean age of 11.14 ± 2.75 years.

Part II
KIDSCREEN-10 Index Health Questionnaire for Children and Young People (parents version)

1. Has your child felt fit and well?	not at all <input type="checkbox"/>	slightly <input type="checkbox"/>	moderately <input type="checkbox"/>	very <input type="checkbox"/>	extremely <input type="checkbox"/>
2. Has your child felt full of energy?	never <input type="checkbox"/>	seldom <input type="checkbox"/>	quite often <input type="checkbox"/>	very often <input type="checkbox"/>	always <input type="checkbox"/>
3. Has your child felt sad?	never <input type="checkbox"/>	seldom <input type="checkbox"/>	quite often <input type="checkbox"/>	very often <input type="checkbox"/>	always <input type="checkbox"/>
4. Has your child felt lonely?	never <input type="checkbox"/>	seldom <input type="checkbox"/>	quite often <input type="checkbox"/>	very often <input type="checkbox"/>	always <input type="checkbox"/>
5. Has your child had enough time for him/herself?	never <input type="checkbox"/>	seldom <input type="checkbox"/>	quite often <input type="checkbox"/>	very often <input type="checkbox"/>	always <input type="checkbox"/>
6. Has your child been able to do the things that he/she wants to do in his/her free time?	never <input type="checkbox"/>	seldom <input type="checkbox"/>	quite often <input type="checkbox"/>	very often <input type="checkbox"/>	always <input type="checkbox"/>
7. Has your child felt that his/her parent(s) treated him/her fairly?	never <input type="checkbox"/>	seldom <input type="checkbox"/>	quite often <input type="checkbox"/>	very often <input type="checkbox"/>	always <input type="checkbox"/>
8. Has your child had fun with his/her friends?	never <input type="checkbox"/>	seldom <input type="checkbox"/>	quite often <input type="checkbox"/>	very often <input type="checkbox"/>	always <input type="checkbox"/>
9. Has your child got on well at school?	not at all <input type="checkbox"/>	slightly <input type="checkbox"/>	moderately <input type="checkbox"/>	very <input type="checkbox"/>	extremely <input type="checkbox"/>
10. Has your child been able to pay attention?	never <input type="checkbox"/>	seldom <input type="checkbox"/>	quite often <input type="checkbox"/>	very often <input type="checkbox"/>	always <input type="checkbox"/>

In general, how would your child rate her/his health? excellent very good good fair poor

Figure 2: Questionnaire Part 2: The Kidscreen-10 scale

Within the 223 children in the age range of 8–12 years, the number of girls (118) was higher than the number of boys (105). However, for within 105 aged 13–18 years, there was little difference in the number of boys (53) and girls (52).

Dietary factors

Most of the children were reported as consuming fresh fruits and vegetables during their time away from school. Most were reported as using mobile phones and/or computers during meals in the same way as they did prior to the COVID-19 pandemic. Children were reported as drinking much more water than they did prior to the COVID-19 pandemic. The consumption of fast food, packaged food, and carbonated beverages decreased during COVID-19 outbreak [Table 1].

Oral hygiene factors

Most of the children were reported as brushing their teeth frequently. Tooth-brushing frequency did not change when they were no longer going to school. However, fewer brushed their teeth under supervision during COVID-19 outbreak [Table 2].

Dental attendance

Prior to the study, most of the children visited the dentist regularly. Few did so in March and April 2020 during the COVID-19 outbreak. The number of children who missed dental appointments in these months was higher compared to those who did not miss appointments. When parents were asked about whether they were afraid of taking the child to dentist, the majority of mothers stated they had anxiety or fear of their children visiting a dentist during the COVID-19 pandemic [Table 3].

Health-related quality of life

The mean total KIDSCREEN-10 score of the study population was 45.59 (Standard deviation [SD] = 10.04, range 18–76). A *t*-test was used to compare the gender differences in terms of KIDSCREEN-10. Boys (mean = 46,

Table 1: Diet and feeding habits of children in coronavirus disease-19 outbreak

Diet and feeding habits	Yes, n (%)	No, n (%)
Increased frequency of fresh fruits consumption	236 (71.9)	92 (28.1)
Increased frequency of fresh vegetables consumption in a day	227 (69.2)	101 (30.8)
Increased water consumption	281 (85.7)	47 (14.3)
Cook by yourself	323 (98.5)	5 (1.5)
Aware of healthy nutrition	321 (97.7)	7 (2.3)
Pay attention to noncariogenic food	234 (71.3)	94 (28.7)
Decreased fast food	310 (94.6)	18 (5.4)
Decreased carbonated beverages	285 (86.9)	43 (13.1)
Decreased package food consumption	266 (81.1)	62 (18.9)
Increased electronics usage during feeding	164 (50)	164 (50)

Table 2: Oral hygiene practices of children in the coronavirus disease-19 outbreak

Oral hygiene practices	Yes, n (%)	No, n (%)
Child's tooth brushing frequency is good	236 (71.7)	92 (28.3)
Child's teeth brushing by supervision during COVID-19 outbreak	99 (30.2)	229 (69.8)
Child's teeth brushing by supervision prior to COVID-19	201 (61.3)	127 (38.7)

COVID-19=Coronavirus disease-19

Table 3: Dental attendance behaviors under coronavirus disease-19 outbreak

Dental attendance behaviors	Yes, n (%)	No, n (%)
Regularly dental visit	198 (60.4)	130 (39.6)
Dental visits during COVID-19 outbreak	17 (5.2)	311 (94.8)
Missed dental appointments during COVID-19 outbreak	211 (64.2)	117 (35.8)
Anxious/afraid taking child to dentist during COVID-19 outbreak	179 (54.6)	149 (45.4)
Dental treatment is a risk factor for COVID-19 infection	261 (79.6)	67 (20.4)
Dentist should use all extra protective materials	312 (95.1)	16 (4.9)
Communicated with dentist using social media	43 (13.1)	285 (86.9)

COVID-19=Coronavirus disease-19

SD = 9.98) had a slightly higher mean QoL score than girls (mean = 45.25, SD = 10.12). However, there were no significant differences between boys and girls in terms of KIDSCREEN-10 scores. KIDSCREEN-10 results for children aged 13 years old or older were influenced more by the COVID-19 outbreak compared to the 8–12 years age group who had better QOL than older age group ($P = 0.008$) [Table 4].

Other factors

Regarding the families of children, 37 (11.2%) of the mothers were health-care workers; there was minimal difference in mean KIDSCREEN-10 score between those with and without health worker mothers [Table 4]. Many mothers 129 (39.3%) had Bachelor degrees and a further 39 (12%) had Masters degrees or doctorates. Higher mean KIDSCREEN-10 scores were found among children whose mothers had only received primary school education, but there was no statistically significant difference between the scores for these mothers and those whose education had continued after primary school ($P = 0.426$) [Table 4]. A minority of mothers 66 (20.1%) were working during the COVID-19 pandemic. The other 262 (79.8%) were not working, and there was no statistically significant difference between the mean KIDSCREEN-10 scores for their children [Table 4].

Only 9 out of the 328 mothers who completed the questionnaires reported that they had tested positive for COVID-19 [Table 4].

Discussion

For billions of people across the world, daily life has changed dramatically in the past months. The coronavirus pandemic has required adaptations from adults, youth and children in the way they study, work and interact with others. The new routine may impact

family well-being by reducing its income, raising fears, increasing anxiety, stress, and instability.^[12]

The new routine, work-at-home for parents, remote classes for children, and economic instability have contributed to changes in dietary habits.^[13] One of the important factors that directly affect oral and dental health is diet.^[14,15] Avoiding cariogenic foods is good for both oral and general health. When children are under quarantine, their nutrition is likely to well controlled since they spend all their time at home with their families. In the course of the present work, the mothers recognized the importance of oral health to the well-being of the rest of the body. Mothers reported that their children consumed more fresh fruit and vegetables and drank more water. Almost all of the mothers reported that they cooked healthy foods for their children and paid attention to noncariogenic foods. The quality of a child's oral hygiene practices and the ability of the parents to prevent their children from having cariogenic snacks are the factors associated with the prevention of dental caries.^[15] The attitudes of mothers and reduced consumption of packaged foods positively affect both oral and dental health and overall health.

In the present study, during the period of pandemic, most of the mothers reported that children brushed teeth regularly. Although there are restrictions on attending for regular dental visits, daily tooth-brushing, and oral hygiene routines will help minimize the need for dental treatment.

The majority of mothers reported in normal times their children made regular visits to dentists but during the COVID-19 outbreak, very few mothers reported that their children made such regular dental visits and the majority missed their dental check-ups. This may adversely affect oral and dental health. Regular dental visits have a great

Table 4: Univariate relationship between KIDSCREEN-10 and sociodemographic social and coronavirus disease-19 related factors in 328 children

Factors	n	KIDSCREEN-10 (mean±SD)	Coefficient (95% CI)	Univariate F	P
Gender	328				
Boys	157	46.00		0.461	0.498
Girls	171	45.25			
Mother's educational status					
Primary	62	47.32±13.30		0.932	0.426
High school	98	45.67±9.42			
Bachelor graduate	129	44.73±8.99			
Master, PhD	39	45.44±8.79			
Working during COVID-19 outbreak					
Yes	66	43.65±10.18		3.265	0.072
No	262	46.13±9.94			
Health care worker					
Yes	37	43.17±8.46		2.52	0.113
No	291	45.94±10.17			
Age groups					
8-12	224	46.60±10.30		7.16	0.008
>13	102	43.42±9.04			
COVID-19 test positive in family					
Yes	9	40.20±15.17		2.68	0.102
No	319	45.76±9.86			

COVID-19=Coronavirus disease-19, CI=Confidence interval, SD=Standard deviation. $P<0,05$

role on oral health and well-being. Regular dental visits allows the early detection of dental problems and limiting any significant or irreversible damage and subsequently, reducing the cost of treatment.^[16] Furthermore, children who visit the dentist regularly are more likely to benefit from preventive dental services.^[17]

Mothers in the study population were afraid of taking their child to the dentist during the COVID-19 pandemic. Respiratory viruses, such as COVID-19, can be transmitted from person to person through direct or indirect contact or through coarse or small droplets.^[18] Dental professionals are potentially at high risk because many dental treatments are aerosol-producing procedures associated with the transmission of acute respiratory infections.^[19,20] In dental clinics, precautions must be taken at all times to minimize the risk of contamination. These measures are critical to prevent the coronavirus from infecting children and transmitting it from infected children to health-care professionals.

Studies of adults' physical activities and well-being indicate that those who undertook increased levels of physical activities had better physical and mental health and psychosocial well-being than those with an inactive lifestyle.^[21] Children under quarantine are have a new daily routine far different from their normal one. It is a more sedentary life, with restrictions on physical activities, far from friends and affects their QoL.

HRQoL represents an individual's overall health covers physical, psychological, and social health.^[21]

QoL screening has been used for many years to assess effects of special situations in children quality of life. KIDSCREEN instruments have been widely used in the general healthy population as well as various health problems.^[22] KIDSCREEN is used not only for the impact of various chronic diseases on the HRQoL, but also for evaluating every situation affecting daily routine life. The findings of a study which investigated the relationship between night-time screen-based media devices use, and sleep outcomes and HRQoL among 11–12 years old found poor sleep outcomes and worse HRQoL in adolescents.^[23] On the other hand, during COVID-19 outbreak, HRQoL studies were conducted for adults and at the end of these studies, it was reported that adults were negatively affected by this process.^[24] In the literature review, prior to the current study, no studies on COVID-19 pandemic and HRQoL of children were found.

Online database tools are used to collect effective information in a shorter time.^[25] In this study, self-reported online questionnaire was used to evaluate how the COVID-19 pandemic period affects children's oral and dental health and quality of life. One of the strengths of the study is the use of the KIDSCREEN for HRQoL instruments for children. Thus, it has been possible to evaluate the HRQoL of children during COVID-19 breakout with KIDSCREEN-10 Turkish version^[8] and allowed us to compare the population of the age and gender. These subjective quality-of-life measures may evaluate oral health interventions in this group. It can

be said that the quality of life was negatively affected by COVID-19 outbreak since the values of all study groups were below 65. KIDSCREEN-10 results for 13 years old or older age group of children were influenced by COVID-19 outbreak but not affected if one of family member was health-care worker or COVID-19 test positive and level of education of mothers.

The current online survey demonstrated the feasibility to assess QoL through the use of Turkish version of KIDSCREEN-10. However, it has a number of limitations in that the sample was almost certainly not representative of all Turkish children aged from 8 to 18 years and their mothers. Having access to WhatsApp was an inclusion criterion for this study; participants may not have been representative of low-income families. Furthermore, unlike those who completed the questionnaire, over 50% of mothers, living in Istanbul, do not have bachelor or higher degrees. In spite of these limitations, to the best of our knowledge, we are the first to report the children's QoL through the use of KIDSCREEN-10 caused due to COVID-19 outbreak and also our study population was sufficiently large to allow us to conclude that Turkish versions of the KIDSCREEN-10 questionnaires.

Conclusions

The results of this study emphasize the importance of oral health and QoL of children during the initial phase of the COVID-19 outbreak. The general perception of QoL in this group of Turkish children seemed to be substantially affected by COVID-19 outbreak. Sufficient descriptive properties of KIDSCREEN-10 in a group of Turkish populations make this instrument suitable for assessing HRQoL in cross-sectional studies. This finding allows us to understand the effect of COVID-19 outbreak, as well as guide the adoption of appropriate measures, if necessary. Finally, further studies are required to confirm the evaluative potential of KIDSCREEN-10 in the age-specific population.

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Conflicts of interest

There are no conflicts of interest.

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