

# Function of the Family Unit, Oral Hygiene Rules and Attitudes to Dental Health in Children During First-Wave 2020 COVID-19 Lockdown

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**Objective:** To examine whether general and dental health and habits of families were affected by the first-wave lockdown due to COVID-19, and whether these habits were related to family functioning, resilience and stress. **Study design:** A cross-sectional study using an online survey disseminated among families with kindergarten and primary school-aged children during the lockdown of March and April 2020. **Results:** A total of 361 respondents completed the survey. Most respondents adapted well to the changes imposed by lockdown and reported that they and their children had low anxiety levels and high mental resilience. Family functioning and behavior were positively correlated with nutrition habits and hygiene. General hygiene was positively correlated with oral hygiene. Respondents who reported requiring dental care had difficulties gaining access to it. Most respondents perceived that it is important to improve patients' digital access to pediatricians and dentists during crises. **Conclusion:** The study showed that better family functioning was associated with better family hygiene and nutrition, parental resilience and lower mental stress among children.

**Keywords:** oral health, corona virus epidemic, children, hygiene, family functioning

## INTRODUCTION

On 31 December 2019, an outbreak of a new corona virus in Wuhan (Hubei Province) in China was first reported. The World Health Organization (WHO) declared the outbreak a public health emergency of international concern on 30 January 2020. The disease caused by the virus was named COVID-19 on 11 February 2020, and was declared a pandemic by the WHO on 11 March, 2020.<sup>1</sup> The massive spread of the disease around the globe required citizen of many countries to change their behavior and normal daily functioning, practice social distancing and isolate to curb viral spread.

COVID-19 spreads mainly through droplets and fomites; therefore, dental professionals are at high risk for COVID-19 infection due to the nature of dental interventions, which include proximity of the dentist to the patient's oropharyngeal region and aerosol generation. Moreover, patients may be exposed to cross contamination if appropriate precautions are not taken.<sup>2</sup> In the wake of the pandemic, following guidance by professional dental associations, many countries saw the cancellation of routine dental care followed by urgent care, so that only emergency dental care was provided. The American Dental Association (ADA) suggested on March 16, 2020 that dentists defer all elective dental care for 3 weeks. The United States Centers for Disease Control and Prevention recommended in March 2020 that dental settings should prioritize urgent and emergency visits and delay elective visits and procedures to protect staff and preserve personal protective equipment and patient care supplies, as well as expand

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available hospital capacity.<sup>3</sup> In New Zealand, all non-essential and elective dental treatment was stopped on March 23 and on the same date all routine face-to-face dentistry was halted in Scotland, Wales and Northern Ireland.<sup>4,5</sup> During the same month, the Israeli Ministry of Health instructed the public to postpone non-essential dental treatments and dental offices were instructed to treat only emergency cases while maintaining strict preventive measures.<sup>6</sup> Guidelines were also published by various other dental organizations.<sup>7-10</sup>

Maintaining oral health in children is based on periodical check-ups and on provision of information on oral hygiene to the parents. Following the cessation of routine regular dental care during the pandemic, it was essential to focus on prevention and maintenance of oral health in the home. A diet rich in fruit and vegetables helps to protect against the onset of gum diseases and caries. Moreover, it is important to limit sugar sweetened beverage consumption<sup>11</sup>. Stressful life events, such as separation, unemployment, chronic illness or depression, may affect the functioning of families. Self-isolation measures and the lockdowns imposed by many countries meant that many families had to adjust and adapt to living together without going outside. Such changes could cause mental pressure, loneliness, and existential anxiety regarding family, friends and the changing world due to the many unknowns related to the new disease, including mortality and infection rates, symptoms, infectiousness, the economic situation and not knowing how long this situation would last. Studies on previous public health emergencies showed that they triggered stress emotional responses comprising higher anxiety levels and other negative emotions.<sup>12</sup> A study that evaluated the impacts of the declaration of a public health emergency in China due to COVID-19 on people's mental health, reported an increase in negative emotions (anxiety, depression, and indignation) and sensitivity to social risks, as well as a decrease in positive emotions and life satisfaction. The study also showed that people were more concerned about their health and families, and less concerned about friends and leisure.<sup>13</sup>

The unique situation imposed on families during lockdown has led us to investigate if dental health and habits were affected during lockdown and if these habits are related to family functioning, resilience and stress.

## MATERIALS AND METHOD

### Setting and participants

This was a cross-sectional study conducted during March and April 2020 among families with kindergarten and school-aged children in Israel. The study was approved by Tel Aviv University's ethics committee (research number 0001233-2). All participants provided their consent for study participation.

### Questionnaire and data collection

The study questionnaire (Figure 1) was constructed by the researchers. The questionnaire was validated for clarity and reliability on a sample of 10 respondents. Due to the lockdown, the questionnaire was disseminated to the study population electronically via the authors' email list and Facebook contacts. To access the questionnaire, the participants clicked a link and completed and submitted the questionnaire online through Google Forms. As such, the data were collected anonymously and automatically transferred to an Excel sheet on the researchers' server.

The questionnaire comprised 8 core variables, each consisting of several questions: 1) Family unit functioning and behavior (16 questions); 2) Nutrition habits (6 questions); 3) Family oral and hand hygiene (5 questions); 4) Access to medical treatments (12 questions); 5) Children's mental stress; 6) Parental functioning and mental resilience, 7) Coronavirus self-isolation and 8) Participant demographics.

### Statistical analysis

The data were analyzed using SPSS software version 25. Categorical variables were summarized as number and percent and continuous variables were summarized as mean and standard deviation. Then, the components of the core variables were summarized by mean and standard deviation, and associations were assessed using Spearman tests. The associations between the core variables, and the demographic characteristics were assessed using Mann-Whitney tests. To examine the relationships between socio-demographic variables, parental resilience, mental stress of children and nutrition habits, a hierarchical multiple linear regression analysis was conducted.

To assess the correlation between the general and oral hygiene, Spearman correlation tests were conducted between the general hygiene questions to the oral hygiene questions.

## RESULTS

### Participant demographics

A total of 361 individuals completed the questionnaires. Respondent demographics are shown in Table 1. The respondent's average age was 42.0±6.2 (SD) years. Most were female (87.0%), born in Israel (92.2%), were married (87.3%) and had an academic education (97.0%).

None of the respondents were diagnosed with COVID-19. Four respondents (1.1%) reported that a member of their family was diagnosed with the disease. Twenty-six respondents (7.2%) reported being instructed to self-isolate and 63 respondents (17.5%) reported that a member of their family had to self-isolate.

### Family behavior and functioning during lockdown

Over half of the respondents (54.0%) perceived that their lives were moderately at risk due to COVID-19, while 39.6% did not perceive any risk. Conversely, 54.0% did not perceive any risk to their children's lives, while 40.2% perceived a moderate risk to their children's lives.

Almost half of the respondents (48.2%) reported that their children were moderately concerned due to the COVID-19 outbreak while 44.9% reported that their children were not concerned at all. According to the respondents, most children (82.3%) were only moderately concerned or not at all concerned about their parents' health, but 83.9% were moderately to very much concerned about their grandparents' health.

Over two-thirds of respondents replied that their children were adapting well or extremely well to the changes in schedule brought about by lockdown and to this situation (68.1 and 65.1%, respectively).

Most respondents reported managing to create a schooling schedule and perceived that are managing with their children's online learning (82.0% and 92%, respectively); 44.9% of

Figure 1: Study questionnaire

**Family and children's behavior**

For each statement below describing the behavior of the family and children during the corona crisis. please mark the number that describes your conduct since the beginning of the crisis (lockdown): (1) Not at all (2) Somewhat (3) To a great extent (4) To a very great extent.

- To what extent do you feel your life is at risk due to the corona virus?
- To what extent are you afraid that your children are at risk of dying?
- How much are your children afraid of the situation?
- How much do your children fear for their parents' health?
- How much do your children fear for their grandparents' health?
- To what extent do you buy food products for fear of a shortage?
- To what extent have your children managed to adapt to the changes in the daily routine?
- To what extent have you succeeded in getting your children to adapt an online studying routine?
- Do you feel that the children have adapted to the situation?
- To what extent does your child cope with online learning?
- To what extent do you, as a parent, cope with operating the computer and online learning?
- To what extent do you feel that learning in this way would help your child complete the required study material?
- To what extent do you feel that under the current situation you are able to focus and think clearly in order to convey your messages to your children?
- To what extent do you feel that the relationship among the siblings is good in the current situation?
- To what extent do you feel that your children can deal with unpleasant feelings?
- To what extent do you currently feel under pressure to focus and think clearly in order to convey your messages to your child?

**Nutrition habits**

For each statement below describing nutrition during this period, please mark the number the represents the most appropriate answer: (1) Not true at all (2) Sometimes true (3) Often true (4) True almost all the time.

- I manage to get my kids to have an eating schedule.
- I feel I control the quality of the food the children eat.
- I feel I control the amount of food the children eat.
- We talk more about eating and the types of food being eaten.
- Consumption of salty and sweet snacks has increased considerably.
- I forbid my children to consume large amounts of snacks because of dental health fears.

**Hygiene habits**

For each statement below describing hygiene during this period, please mark the number the represents the most appropriate answer: (1) Not at all (2) Somewhat (3) To a great extent.

- Are the rules of hygiene observed at home according to the guidelines?
- Tooth brushing habits are maintained in a similar way to those before the crisis.
- I put more emphasis on brushing teeth with the children.
- The children are compliant and obey the new rules of hygiene (hand washing).
- The children are compliant and obey the rules of hygiene relating to brushing teeth more than usual.

**Access to medical treatments**

For each question below about accessibility to medical treatments please indicate (1) Yes (2) No.

- During this period of staying at home, did your child need medical care (not teeth)?

If the answer is "Yes",

- Was treatment immediately accessible?
- Were you please with the accessibility of the pediatrician?
- Did your child have a toothache or discomfort during this period?

If the answer is "Yes",

- Have you had a problem accessing dental care in the medical setting to which you belong?
- Do you think it is necessary to intentionally improve medical accessibility to pediatricians in times of crisis?
- Would provision of access to dentists in order to ask questions help you in times of crisis?
- Are you afraid to take your child to the dental clinic for emergency care because you fear getting infected by the corona virus?
- Are you refraining from going to the dental clinic these days due to the financial situation?
- Did your child receive dental care during this period?

If the answer is "Yes",

- Was treatment provided by the public healthcare services?
- Was treatment provided by private services?

**The children's feelings**

Below is a list of feelings and problems that children may have encountered during this period. Please read each section and mark the appropriate answer: (1) Not at all (2) Slightly (3) Somewhat (4) To a large extent.

- Nervousness.
- Loneliness.
- Upset.
- Disinterest.
- Anger.
- Fear.
- Anxiety of going to public places.

**Parent's emotional state**

Please indicate your feeling mood as a parent during the Corona crisis (lockdown) in the following situations: (1) Extremely bad (2) Not good (3) Quite good (4) Very good.

- Work.
- Health.
- Free time.
- Social connections.
- Family relationships.
- Daily functioning.
- Giving confidence to your child.

**Demographics**

Age

Marital status: 1. Married 2. Divorced. 3. Widow. 4. In a relationship. 5. Single parent. 6. Other.

Education: 1. Elementary school. 2. High school. 3. Academic.

Were you born in Israel? 1. Yes. 2. No.

Were you instructed to self-isolate? 1. Yes. 2. No.

Has anyone in your family been instructed to self-isolate? 1. Yes. 2. No.

Were you instructed to self-isolate due to proximity to a patient with verified COVID-19 infection? 1. Yes. 2. No.

Has anyone in your family been instructed to self-isolate due to proximity to a patient with verified COVID-19 infection? 1. Yes. 2. No.

Have you been diagnosed with COVID-19? 1. Yes. 2. No.

Has anyone in your family been diagnosed with COVID-19? 1. Yes. 2. No

respondents reported that their children adapted well to extremely well to online school lessons and 38.5% reported that their children adapted moderately to online lessons. About two-thirds of respondents (67.3%) felt that online school lessons would help their children to catch up with school material that was not taught due to closure of schools.

Most respondents (75.6%) reported that they remain focused and think clearly despite the situation. Most (74.2%) reported good relationships among siblings in the household and 61.2% perceived that their children could cope with bad feelings.

**Nutrition habits**

Most respondents (69.0%) reported that there is a regular eating schedule at home almost all the time or very often, 76.2% and 64.3% perceived that they are in control—almost all the time or very often—of the quality and quantity of food, respectively, that their children eat. Over half of the respondents (55.4%) felt that food and eating are being discussed more often at this time, and 60.9% reported that consumption of snacks and sweets has increased in their household. Over half of respondents (52.5%) reported that their children are usually or very often not allowed to consume large quantities of snacks in order to maintain dental/oral health.

**Hygiene habits**

Most respondents (78.9%) reported maintaining high levels of hygiene according to the guidelines in the household and 75.6% reported that their children comply with the new guidelines of washing their hands more often. A similar percentage (78.1%) reported that tooth brushing habits are the same as before lockdown, 33.2% reported that they attribute greater importance to tooth brushing than before, but only 22.7% reported that their children comply with brushing their teeth more often.

**Table 1. Participant demographics**

Parameter	Study population
	N=361 Mean
<b>Age, mean ± SD</b>	42.0 ± 6.2
<b>Gender, n (%)</b>	
Male	47 (13.0)
Female	314 (87.0)
<b>Marital status, n (%)</b>	
Married	315 (87.3)
Divorced	22 (6.1)
Widow	4 (1.1)
In relationship	11 (3.0)
Single parent	7 (1.9)
Other	2 (0.6)
<b>Education, n (%)</b>	
Academic (>12 years)	350 (97.0)
High school (≤12 years)	11 (3.0)
<b>Country of birth, n (%)</b>	
Israel	333 (92.2)
Abroad	28 (7.8)

n= number, SD=standard deviation

**Access to urgent medical and dental care**

Most respondents (83.4%) reported that their children did not require medical treatments during lockdown. The vast majority of those who did require medical treatments (59 of 60 respondents, 99.3%) did not have any problems in receiving it. Regarding dental treatments, 12.5% of respondents reported that their children had a toothache or some other related oral discomfort. Of these respondents, 60% (27 of 45) reported receiving dental care as well as difficulties in accessing it.

Most respondents responded that in times of crisis it is important to improve digital access to pediatricians and dentists (87.3% and 85.2%, respectively).

Two third of respondents reported being apprehensive in seeking out dental treatment for their children because of fear of COVID-19 infection.

**Children’s mental stress during lockdown**

When asked about their children’s feelings during this period, most respondents reported that their children were not at all or only slightly anxious (74.5%), lonely (73.1%), moody (80.3%), disinterested (80.6%), or afraid (88.9%). Over two-thirds of respondents (67.9%) reported that their children were not fearful at all or only slightly fearful of going to public places.

**Parental functioning and mental resilience during lockdown**

When asked about their own feelings during the COVID-19 crisis, the majority of respondents perceived their health, daily functioning and family relations (96.1, 93.1 and 88.9%, respectively) as quite good to very good, and over two-thirds (67.6%) reported that they felt quite good to very good about their work. About half of the respondents (52.1%) felt the quantity of their free time was quite good to very good and 56.8% reported their social relationships were quite good to very good.

**Association between family functioning and behavior, hygiene, nutrition, parental mental resilience, children’s mental stress and studying routine**

Table 2 shows the means and standard deviations of core variables in the study and Table 3 shows the means and standard deviations of the items relating to nutrition and hygiene habits.

Analysis of the association between the core variables in the study, using Spearman correlation (Table 4), showed that family functioning and behavior are positively correlated with nutrition habits (r=0.20, p<0.01), hygiene habits (r=0.21, p<0.01) and parental mental resilience (r=0.39, p<0.01), and negatively correlated with their children’s mental stress (r=-0.15, p<0.01).

Nutrition habits are positively correlated with hygiene habits (r=0.23, p<0.01), and with parental mental resilience (r=0.17, p<0.01), and with lower mental stress of children (r=-0.18, p<0.01). Parental mental resilience was positively correlated with nutrition (r=0.17, p<0.01) and hygiene habits (r=0.14, p<0.01). Married parents reported marginally better nutrition habits in comparison with non-married parents (p=0.07 by Mann-Whitney test) but no association was found between marital status and hygiene habits.

A negative correlation was found between children’s mental stress and nutrition habits (r=-0.18, p<0.01), but no correlation was found between the children’s mental stress and oral hygiene (r=-0.06, p=0.27).

**Table 2: Means, standard deviations and ranges for the core variables**

	Mean	Standard Deviation	Range
Family behavior	2.34	0.32	1 (not at all)–4 (to a very great extent)
Nutrition habits	2.85	0.53	1 (not true at all)–4 (true almost all the time)
Hygiene habits	2.43	0.39	1 (not at all) – 3 (to a great extent)
Access to urgent medical care	3.59	1.66	0 (none of the answers were positive) – 10 (all answers were positive)*
Mental stress of children	1.91	0.59	1 (not at all) – 4 (to a great extent)
Parental mental functioning and resilience	3.02	0.45	1(extremely bad) – 4 (very good)
Coronavirus social isolation	0.38	0.84	1 (none of the answers were positive) – 4 (all answers were positive)*

\*Excluding two duplicate questions

**Table 3: Means, standard deviations, and ranges for the nutrition and hygiene questions**

	Mean	Standard deviation	Range*
<b>Nutrition</b>			
I manage to get my kids to have an eating schedule.	2.92	0.89	1-4
I feel I control the quality of the food the children eat.	3.07	0.83	1-4
I feel I control the amount of food the children eat.	2.78	0.88	1-4
We talk more about eating and the types of food being eaten.	2.58	0.93	1-4
Consumption of salty and sweet snacks has increased considerably.	3.15	0.82	1-4
I forbid my children to consume large amounts of snacks due to risk for oral health.	2.61	0.94	1-4
<b>Hygiene</b>			
Are the rules of hygiene observed at home according to the guidelines?	2.78	0.43	1-3
Tooth brushing habits are maintained in a similar way to those before the crisis.	2.76	0.48	1-3
I put more emphasis on brushing teeth with the children.	2.02	0.80	1-3
The children are compliant and obey the new rules of hygiene (hand washing).	2.74	0.47	1-3
The children are compliant and obey the rules of hygiene relating to brushing teeth more than usual.	1.86	0.76	1-3

\*Range for questions on nutrition habits: (1) Not true at all (2) Sometimes true (3) Often true (4) True almost all the time; Range for questions on hygiene habits: (1) Not at all (2) Somewhat (3) To a great extent.

**Table 4: Associations between the core variables.**

	1	2	3	4	5	6
Family behavior						
Nutrition habits	0.20**					
Hygiene habits	0.21**	0.23**				
Accessibility to medical treatments	0.03	-0.07	0.03			
Mental stress of children	-0.15**	-0.18**	-0.11*	0.20**		
Parental mental resilience	0.39**	0.17**	0.14**	-0.14*	-0.31**	
Coronavirus social isolation	0.01	0.04	-0.05	0.02	-0.03	-0.02

\*p <0.05, \*\*p <0.01

Oral hygiene was assessed using the questions “*Tooth brushing habits are maintained in a similar way to those before the crisis*”, “*I put greater emphasis on brushing teeth with the children*” and “*The children are compliant and obey the rules of hygiene relating to brushing teeth more than usual*”. The average score was 2.21 (SD=0.52, range=1-3). General hygiene was assessed using the questions “*Are the rules of hygiene observed at home according to the guidelines?*” and “*The children are compliant and obey the new rules of hygiene (hand washing)*”. The average score was 2.76

(SD=0.38, range=1-3). General hygiene was positively correlated with oral hygiene (r=0.35, p<0.01 by Mann Whitney test).

Greater access to urgent medical care was positively correlated with higher parental mental resilience (r=0.20, p<0.01), and negatively correlated with children’s mental stress (r=-0.14, p<0.01). Married parents reported less access to urgent medical care (Mean=3.53, SD=1.64) than non-married parents (Mean=4.00, SD=1.70), but this difference was only marginally significant (p=0.06).

No correlation was found between Coronavirus self-isolation and the other variables. Difference between participants who were in self-isolation and participants who were not in self-isolation, were assessed using Mann-Whitney tests. The results showed a marginal difference between self-isolation and hygiene habits ( $p=0.053$ ). That is, parents who had been in self-isolation (Mean=2.58, SD=0.33) reported better hygiene habits in comparison parents who had not been in self-isolation (Mean=2.42, SD=0.39). No difference in hygiene or nutrition habits were found between those who had a family member in self-isolation and those who did not. There were no differences in nutrition and oral habits between respondents who had a family member with COVID-19 and those who did not.

To assess the correlation between the children’s learning routine and nutrition and hygiene habits at home, the questions “*To what extent have your children managed to adapt to the changes in the daily routine*”, “*To what extent have you succeeded in getting your children to adapt an online studying routine*”, “*Do you feel that the children have adapted to the situation?*”, “*To what extent does your child cope with online learning?*”, “*To what extent do you, as a parent, cope with operating the computer and online learning?*” and “*To what extent do you currently feel under pressure to focus and think clearly in order to convey your messages to your child?*” were averaged for one variable. The average score was 2.55 (SD=0.53, range=1.14-4.00). The children’s studying routine was positively correlated with nutrition ( $r=0.27$ ,  $p<0.01$ ) and hygiene habits ( $r=0.21$ ,  $p<0.01$ ).

**Multivariate analysis for predicting nutrition habits during lockdown**

To examine the relationships between socio-demographic variables, parental resilience, children’s mental stress and nutrition habits, a hierarchical multiple linear regression analysis was conducted. The variables in the model accounted for approximately 16.20% of the total variance in nutrition habits ( $F_{(10, 348)}=6.73$ ,  $p<0.01$ ).

Results showed a negative correlation between respondents’ age and nutrition habits ( $\beta=-0.20$ ,  $p<0.01$ ), meaning that younger parents maintain better nutrition habits in comparison with older parents. Family functioning and behavior ( $\beta=0.18$ ,  $p<0.01$ ) and hygiene habits ( $\beta=0.14$ ,  $p<0.01$ ), positively predicted nutrition habits, while mental stress of children ( $\beta=-0.14$ ,  $p=0.01$ ) negatively predicted nutrition habits. (Table 5).

Multivariate analysis for predicting hygiene habits during lockdown

To examine the relationships between socio-demographic variables, parental attitudes, children’s feelings and nutrition habits, a hierarchical multiple linear regression analysis was conducted. The variables in the model accounted for approximately 11.70% of the total variance in hygiene habits ( $F_{(10, 348)}=4.60$ ,  $p<0.01$ ).

Results showed a negative correlation between age and hygiene habits ( $\beta=-0.13$ ,  $p<0.05$ ), meaning younger parents keep better hygiene habits in comparison with older parents. Family behavior ( $\beta=0.22$ ,  $p<0.01$ ) and nutrition habits ( $\beta=0.15$ ,  $p<0.01$ ), positively predicted hygiene habits (Table 6).

**Table 5: Standardized coefficients (β) to predict nutrition habits during lockdown**

Nutrition habits		
1	Age	-0.15** -0.20**
	Gender (male)	0.00 0.02
	Marital status (married)	0.05 0.01
	Country of birth (Israel)	-0.05 -0.05
2	Family behavior	0.18**
	Hygiene habits	0.14**
	Accessibility to medical treatments	-0.03
	Mental stress of children	-0.14*
	Parental resilience	0.09
	Coronavirus insulation and adhesion	0.06
	R <sup>2</sup>	0.03* 0.16**
	R <sup>2</sup> change	0.03* 0.13**

\* $p<0.05$ , \*\* $p<0.01$

**Table 6: Standardized coefficients (β) to predict hygiene habits during Coronavirus social isolation**

Hygiene habits		
1	Age	-0.08 -0.13*
	Gender (male)	-0.03 -0.02
	Marital status (married)	-0.02 -0.06
	Country of birth (Israel)	-0.06 -0.05
2	Family behavior	0.22**
	Nutrition habits	0.15**
	Accessibility to medical treatments	0.04
	Mental stress of children	-0.03
	Parental resilience	0.07
	Coronavirus insulation and adhesion	-0.02
	R <sup>2</sup>	0.01 0.12**
	R <sup>2</sup> change	0.01 0.11**

\* $p < .05$ , \*\* $p < .01$

**DISCUSSION**

Our findings show that lockdown due to the COVID-19 pandemic did not greatly affect most of our study population: According to the respondents they adapted well to the changes imposed by lockdown and reported low anxiety levels and high mental resilience – both for themselves and their children. Our findings also show that better family functioning and behavior and better nutrition habits are correlated with improved hygiene, and that better general hygiene is correlated with better dental hygiene.

Parents’ oral health-related attitudes and their dental behaviors, such as locus of control and self-efficacy impact their children’s dental health,<sup>14-18</sup> In addition, parental psychosocial factors, such as low sense of coherence, maternal depression, parental stress and indulgent parenting, have shown to negatively affect their children’s oral health.<sup>19-21</sup>

Renzaho and de Silva-Sanigorski investigated the relationships between child dental health family structure, parental distress, and family functioning. They reported that poor family functioning,



parental mental illness and child mental health or conduct problems were all associated with poor oral health in children. These findings were independent of parental education, household income, language spoken at home, country of birth, child gender and parent's age.<sup>22</sup> Similarly, Duijster *et al* reported that lower family functioning was associated with an increased likelihood of engaging in less favorable oral hygiene behaviors.<sup>23</sup> Family functioning did not significantly differ between single parents and those who raised their child with a partner. In the current study married parents reported marginally better nutrition habits in comparison with non-married parents but no association was found between marital status and hygiene habits.

The vast majority of those who required medical care did not have any problems receiving it. In contrast, those who reported requiring dental care had difficulties gaining access to such treatments because dentists feared being infected with corona virus, or due to travel restrictions. Importantly, most respondents perceived that it is important to improve digital access to pediatricians and dentists during times of crises. Indeed, the pandemic may have hastened the process of using telehealth in dentistry to screen patients for dental problems.

Our study is limited by the cross-sectional nature of the data, which limit our ability to infer casual relationships. In addition, the data are self-reported, which introduces risks of recall biases and social desirability. Moreover, some of the measures should be considered as the parental perception of their children's mental state rather than the child's mental state. Sociodemographic variables, including the number of children in the family and their ages were also not assessed; however, questionnaires were sent to families with children who attend kindergartens and primary schools. Family structure was previously found to be associated with children's dental health: children from larger households, single-parent families, and those with higher birth order showed higher levels of caries.<sup>24</sup> The study participants were obtained through a convenience sample because, due to the lockdown, the only possibility to reach the target population was electronically by email or social media (Facebook); therefore, the sampled population behavior may not be generalizable to the general population in Israel. The vast majority of respondents were women with an academic education, indicating a higher socioeconomic position.<sup>25</sup> Data on family functioning relied on the point of view of one individual family member, which may have resulted in a biased view of the family functioning.

## CONCLUSIONS

The current study showed that better family functioning during lockdown due to the COVID-19 epidemic was associated with better family hygiene and nutrition, parental resilience and lower mental stress among children, as reported by their parents.

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This research received no external funding.

### Conflicts of Interest:

The authors declare no conflict of interest

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