Health Practices, Nutrition, and Other Aspects of Lifestyles of Children Less Than 18 Years during COVID-19 Pandemic in Egypt: Role of Mothers


Department of Child Health, Medical Research and Clinical Studies Institute, National Research Centre, Giza, Egypt

Abstract

BACKGROUND: COVID-19 is a public health crisis of worldwide fear which under strategies of isolation, alterations to lifestyle behaviors were typically inevitable. These included extreme changes in hygiene practices, dietary habits, and physical activity.

AIM: The present study aimed to assess how mothers managed their children at home during COVID-19 lockdown as regards health practices such as, hand washing, eating behaviors, and their daily lifestyles such as physical activity, screen time, and sleep.

METHODS: Mothers of children aged <18 years were enrolled in the study. Online survey was conducted through Google form May 17, 2020, to the June 01, 2020. A specific questionnaire was prepared to fulfill the objective of the study.

RESULTS: Mothers of 83.6% of children succeeded in establishing a good behavior of hand washing using soap and water when their hands are visibly dirty versus 62.8% doing the same when their hands are not visibly dirty. Father’s occupation could have significant association with hand washing. During lockdown, 74.4% of mothers stopped buying prepared foods from outside and 88% of them were keen to prepare healthy meals for their children, dietary supplements were used by 41.6% of participant mothers; meanwhile, the percentage was 38.8% by their children.

CONCLUSION: COVID-19 pandemic has brought intense changes to health behaviors of children regarding hand washing, eating habits, sleep, and physical activity.

Introduction

The World Health Organization (WHO) asserted on January 31, 2020, the outbreak of a new coronavirus accountable for an infection called coronavirus disease (COVID-19) as a worldwide public health emergency [1]. At present, COVID-19 pandemic is a prominent challenge across the world, and people all over the world are facing a distinctive situation. To decrease the spread of the coronavirus, countries around the world have been implementing different measures, consisting of lockdown, closure of schools and institutes, social distancing, and targeted quarantine for suspected infected individuals [1]. Although, quarantine measures are useful for containing COVID-19, they may inflict more psychological load than the physical sufferings caused by the virus as the adoption of unhealthy eating behaviors and sleeping habits [2]. Since quarantine is a new experience for children, it generates feelings of fear, sadness, worry, or stress among children [3]. In addition, focusing on digital education, due to school closure, has a lasting negative impact on children, academic performance [4].

Mothers are the top contributors in a family, and their roles became more pronounced during COVID-19 lockdown as their children were at home all the day. Good hygiene practices, as wearing masks and regular hand washing with soap and water or alcohol-based sanitizers, alongside with physical distancing can inhibit transmission of COVID-19 [5].

One of the foremost determinants of health is optimum nutrition that can enhance well-being and may alleviate the risk and illness linked with COVID-19 [5]. There is an observable alteration in diet behaviors through COVID-19 pandemic in which people is purchasing more food items, and then they may be making more home-cooked meals [6]. Consistent physical activity could influence various health consequences as, physical, physiological, mental health, and well-being [7]. Inopportunely, for the majority of individuals, measures of quarantine and self-isolation will have an intense adverse effect on levels of physical activity with parks, gyms, and a multitude of other entertaining facilities closed off [8]. Decrease in practicing physical activity and increased sedentary behavior through COVID-19 quarantine can
influence quality of sleep which is identified to endanger immune function that is a vital aspect for pertaining to COVID-19 [8].

A balanced diet comprising a variety of vitamins and minerals, together with healthy lifestyle factors such as sufficient sleep and exercise and low stress, most efficiently primes the body to combat infections and diseases.

The present study aimed to assess how mothers managed their children at home during the first wave of COVID-19 lockdown as regards health practices such as, hand washing, eating behaviors, and their daily lifestyle such as physical activity, screen time, and sleep during the first wave.

**Design and Methods**

**Study subjects**

An online survey (using a Google form) was conducted during the lockdown of the first wave of the pandemic and the nationwide quarantine due to COVID-19 during the period from May 17, 2020, to the June 01, 2020 to explore the status of health practices of children and adolescents during the lockdown.

**Inclusion criteria**

The following criteria were include in the study:

Mothers whose children <18 years of age and agreed to participate in the study.

**Exclusion criteria**

The following criteria were excluded from the study:

Mothers who have no children under 18 years old, mothers did not complete the survey, and mothers who refused to participate in the study. As it was not feasible to do a community-based national sampling survey during this distinct period, the researchers decided to assemble the data online.

Specific questionnaire forms were prepared with different questions that fulfill the objective of the study by one of the team members. Questionnaire forms were reviewed by two researchers to assess the suitability, clarity, and appropriateness of the questionnaire. A brief description of the study, its objectives, and the assertion of confidentiality were given to the participants before starting the study. Confidentiality was asserted by giving a specific code to every participant. The participants (250 mothers) completed an online questionnaire following their agreement to contribute in the study.

**Ethical approval**

The study was in full compliance with the rules and regulations of the Ethical Committee of the Medical Research Unit of the National Research Center, Egypt. Approval number was 20094.

The structured questionnaire included different parts:

1. Sociodemographic characteristics of mothers and their husbands, including their education and occupations. Children (576 child) were classified to three age groups (<5 years of age, 5–<12 years, and 12–<18 years of age)
2. Hand washing behaviors in different circumstances, and how to protect themselves and others from infection with COVID-19 as recommended by the WHO, and centers for diseases control and prevention, 2020 [9], [10]. Answers were categorized as follow: always, sometimes, and never
3. Mothers, practices of shopping, and eating behaviors during COVID-19 lockdown were explored
4. Dietary supplements used by mothers and their children (especially vitamins C, D, and zinc) during COVID-19 lockdown were detected
5. Drinking water, physical activity, screen time, and setting a specific time to go to bed were also involved in the questionnaire.

**Data processing and statistical analysis**

All data were extracted by excel forms then transformed to SPSS to facilitate the analysis. Descriptive analysis for all variables was performed as frequency and percentage. Impact of mothers, and fathers, education and job on children, and behaviors were tested using Chi-square test.

**Results**

**Sociodemographic characteristics**

All respondents mothers were <50 years old, and as regards to their children (n=576), 43.4% of them were between age of 5 and <12 years (Table 1).

**COVID-19 and hand washing behaviors**

Our results showed that 96% of the respondent mothers were talking with their children about COVID-19 pandemic. A higher percentage of respondent mothers (83.6%) reported that their children always washed their hands with soap and water when their hands are visible dirty; meanwhile, the percentage decreased to 62.8% when their hands are not visibly
dirty. About 20% of the respondent mothers mentioned that their children cleaned their hands using alcohol-based hand rub when their hands are not visibly dirty, as shown in Figure 1.

![Hand washing behavior of children during COVID-19 lockdown](image)

**Figure 1: Hand washing behavior of children during COVID-19 lockdown**

The daily hand washing practices by children are shown in Table 2.

### Table 2: Daily hand washing practices by children as reported by mothers (n = 250)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
</tr>
<tr>
<td>My children wash their hand with soap and water</td>
<td>186</td>
<td>74.4</td>
<td>41</td>
</tr>
<tr>
<td>After playing with animals</td>
<td>186</td>
<td>74.4</td>
<td>41</td>
</tr>
<tr>
<td>After coughing or sneezing</td>
<td>194</td>
<td>77.6</td>
<td>37</td>
</tr>
<tr>
<td>Before, during, and after preparing food</td>
<td>179</td>
<td>71.6</td>
<td>56</td>
</tr>
<tr>
<td>Before eating</td>
<td>149</td>
<td>59.6</td>
<td>60</td>
</tr>
<tr>
<td>After toilett use</td>
<td>215</td>
<td>86.0</td>
<td>28</td>
</tr>
</tbody>
</table>

Practices performed by children and adolescents to protect others from getting sick are shown in Table 3.

### Table 3: Children’s practices to protect others from getting sick

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes</th>
<th>No.</th>
<th>Percent</th>
<th>Sometimes</th>
<th>No.</th>
<th>Percent</th>
<th>No</th>
<th>Percent</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>For every child, his/her own personal utensils</td>
<td>156</td>
<td>62.4</td>
<td>65</td>
<td>26.0</td>
<td>29</td>
<td>11.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children avoid shaking hands, hugging or kissing any person</td>
<td>132</td>
<td>53.2</td>
<td>98</td>
<td>39.2</td>
<td>19</td>
<td>7.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children on coughing or sneezing, they cover their mouth, and nose with flexed elbow or tissue</td>
<td>152</td>
<td>60.8</td>
<td>87</td>
<td>34.8</td>
<td>11</td>
<td>4.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children throw tissue into closed bin immediately after use</td>
<td>203</td>
<td>81.2</td>
<td>38</td>
<td>15.2</td>
<td>9</td>
<td>3.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children clean hands with alcohol based hand rub or soap and water after sneezing or coughing</td>
<td>92</td>
<td>36.8</td>
<td>105</td>
<td>42.0</td>
<td>53</td>
<td>21.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children did not spit on the ground</td>
<td>231</td>
<td>92.4</td>
<td>8</td>
<td>3.2</td>
<td>11</td>
<td>4.4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 4: Relationship between father’s occupation and hand washing practices of children when hands were visible dirty

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes</th>
<th>No.</th>
<th>Percent</th>
<th>Sometimes</th>
<th>No.</th>
<th>Percent</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>My children wash their hand with soap and water after using the toilet</td>
<td>186</td>
<td>74.4</td>
<td>41</td>
<td>16.4</td>
<td>23</td>
<td>9.2</td>
<td></td>
</tr>
</tbody>
</table>

Shopping practices and eating behaviors during COVID-19 lockdown

The study showed that 74.4% of the mothers stopped buying prepared food from outside, and 88% of them were keen to prepare healthy meals for their families. More than one quarter of their children shared them in food preparation, as shown in Table 5.

### Table 5: Shopping practices and eating behaviors during COVID-19 pandemic

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes</th>
<th>No.</th>
<th>Percent</th>
<th>Sometimes</th>
<th>No.</th>
<th>Percent</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you stop buying prepared food from outside?</td>
<td>186</td>
<td>74.4</td>
<td>41</td>
<td>16.4</td>
<td>23</td>
<td>9.2</td>
<td></td>
</tr>
<tr>
<td>Did you lessen times for going to shopping?</td>
<td>245</td>
<td>98.0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Did you prepare your meals at home?</td>
<td>245</td>
<td>98.0</td>
<td>5</td>
<td>2.0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Did your children share in food preparation?</td>
<td>69</td>
<td>27.6</td>
<td>114</td>
<td>45.6</td>
<td>67</td>
<td>26.8</td>
<td></td>
</tr>
<tr>
<td>Are you keen to prepare healthy meals to your children?</td>
<td>220</td>
<td>88.0</td>
<td>29</td>
<td>11.6</td>
<td>1</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Are you keen that your children eat salad every day?</td>
<td>154</td>
<td>61.6</td>
<td>85</td>
<td>34.0</td>
<td>11</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>Did all the family eat together?</td>
<td>220</td>
<td>88.0</td>
<td>26</td>
<td>10.4</td>
<td>4</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

The most frequent food items consumed by the whole family 1 week before the survey were eggs (90.8%), garlic (80.4%), onions (94.4%), oranges (40.4%), strawberries (44.4%), and bananas (56%). On the other hand, green leafy vegetables as spinach and broccoli were consumed by small number of families (9.2%, and 8.4%, respectively).

### Dietary supplements use during COVID-19 lockdown

Dietary supplement use (always) by mothers and their children was 41.6% versus 38.3%, respectively. The highest percentage of those children who took dietary supplements were those aged 6–12 years. The most frequent dietary supplements included...
used were zinc, vitamins D, and C (14.0%, 20.8%, and 24.0%, respectively), as shown in Figures 2 and 3.

**Figure 2: Dietary supplements intake during COVID-19 lock down**

![Figure 2: Dietary supplements intake during COVID-19 lock down]

**Figure 3: Most frequent dietary supplements used by children during COVID-19 lock down**

![Figure 3: Most frequent dietary supplements used by children during COVID-19 lock down]

**Going outside during COVID-19 lockdown**

About 6% of the respondent mothers mentioned that their children were always getting outside home during COVID-19 pandemic, whereas 52.8% of mothers sometimes allowed their children to go outside, while 41.2% of mothers did not allow their children to go outside home during the pandemic. Wearing masks was always practiced by 42.8% of children who went outside during the pandemic against 31.3% who did not wear.

**Daily life practices of children during COVID-19 quarantine**

Drinking enough water was practiced by 78% of the studied children as reported by their mothers. Meanwhile, 39.2% of them did not practice any physical activity. More than one quarter (27.2%) of the children had no chance for sun exposure. Mothers reported that they could not limit the screen time for their children (28.3%).

As regards to sleeping behaviors, only 32% of the respondent mothers succeeded in setting a specific time for their children to go to bed, though 84% of them stated that their children slept 8 h per day, as shown in Table 6.

**Table 6: Daily life practices of children during COVID-19 quarantine**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes</th>
<th>Sometimes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun exposure</td>
<td>78</td>
<td>104</td>
<td>68</td>
</tr>
<tr>
<td>Practicing any physical activity</td>
<td>62</td>
<td>90</td>
<td>98</td>
</tr>
<tr>
<td>Enough water intake</td>
<td>196</td>
<td>53</td>
<td>1</td>
</tr>
<tr>
<td>Limited screen time</td>
<td>108</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>Did you set a specific time for going bed?</td>
<td>80</td>
<td>77</td>
<td>93</td>
</tr>
<tr>
<td>Did your children sleep 8 h per day?</td>
<td>210</td>
<td>30</td>
<td>10</td>
</tr>
</tbody>
</table>

Our study showed that more than 75% of the included children were <12 years. This means that their mothers were responsible for their education about hygiene, their nutrition, and how to protect themselves from getting infected with COVID-19 virus.

Our study showed that most of the enrolled mothers talked with their children about COVID-19. This is in agreement with the WHO guidance which recommended discussion of COVID-19 with children in a truthful and age-appropriate way. Silence and secrets do not protect the children. This will help alleviate the emotional feelings as sadness and fear from children and feeling save in their community [11].

Mothers reported that their children washed their hands using soap and water when they were visibly dirty (83.6%), while 62.8% of mothers reported that their children cleaned their hands by soap and water when their hands were not visibly dirty. Our results were higher than those reported by Chen et al., 2020 who found that 42.05% of primary school students showed a good behavior of hand washing [12]. In regards to hand washing after going to the toilet, our results were similar to that reported by Mohammed and Khameis, 2020, who reported that 83.7% of the respondents in their study washed their hands after using the toilet [13]. Additionally, in regards to hand washing after sneezing and coughing, our results were less than that reported by Mohammed and Khameis, 2020, who reported that 33.3% of the respondents in their study washed their hands after sneezing and coughing [13].

Previous studies have stated that a proper hand washing intervention could disrupt the cycle of transmission and decrease the risk between 6% and 44% [14]. Therefore, hand hygiene education is curiously valuable in avoiding infectious diseases particularly for young children. Consequently, family hygiene education should be conducted depending on children’s cognitive ability. Parents must increase the level of self-protection alertness and make themselves disciplined [12]. Hence, hand washing is a key to retain children well.

Our study showed that the majority of the participated children showed good hygiene behaviors such as not spitting on the ground, avoided shaking hands, or kissing any person, they covered their mouth and nose with flexed elbow or tissue on coughing or sneezing, to protect others from getting sick. The well-known ways of transmission of COVID-19 are droplet and contact transmission [15]. Consequently, the...
Practices of shopping and eating behaviors have altered through COVID-19 pandemic. It is advocated to lessen visits to the supermarket by arranging meals [16]. This was the case in our study. A number of the respondent mothers stated that their children shared in food preparation. Our results were in agreement with Raja, 2021 who reported that 96.1 % of the parents prepared food at home during the lockdown [17]. Furthermore, an Italian survey showed that during the lockdown, Italians have more preference to cook and the intake of homemade desserts, pizza, and bread has increased, while the intake of processed meat, snacks, sugary, and carbonated drinks has declined [18]. Philippe et al., in 2021, stated that parents cooked more with their children during lockdown [19]. During regular daily life, several individuals frequently do not have the time to make home-cooked meals. Staying for a long period of time at home during COVID-19 lockdown may provide the opportunity to prepare those recipes that individual formerly did not have time to make using items with less preservatives and additives. Spending more time at home during this period may also offer novel prospects to involve children in cooking healthy foods that can aid them to obtain significant life skills that they can convey into adulthood [20]. Furthermore, COVID-19 lockdown made many families spending more time at home, which give new chances to share meals together. Family meals are a significant chance for parents to be role models for eating healthy food, and for boosting family bonds [20].

A lower percentage of the respondent mothers stated that their children were getting outside home during COVID-19 pandemic, and 42.8% of them wore masks. These results were less than what was reported by Chen et al., 2020, who found that 51.6% of the primary school students had a good behavior of mask-wearing [12]. Getting outdoors is a preferred past time of adults and children similarly, but with the continuing COVID-19 pandemic, parents are confronted with handling how to have a good time being outside while protecting their family’s health. As the virus spread primarily through respiratory droplets, people may become infected by touching their mouth, nose, or eyes after touching surfaces contaminated with the virus [21]. To safely enjoy spending time outdoors, people should follow the precautions, for example, wearing a mask, keeping at least one meter away from each other, regularly washing hands, trying to avoid peak times and crowded settings, and take roads that are less congested whenever probable [21].

The majority of the participated mothers were keen to prepare healthy meals to their children and they were also keen that their children ate salad every day. As there is no evidence-based treatment for COVID-19 and the current proof proposes that the only justifiable way to live in the current state is to reinforce the immune system; therefore, the intake of optimum nutrient through well-balanced meals and the usage of good hygiene habits is possibly the utmost efficient attitude for handling the continual risk of viral infection [5]. A bidirectional correlation presents between nutrition and infection, whereby poor nutritional state disposes one to infection and where infection is aggravated by a poor nutritional state. As a result, malnutrition diminishes the immune response of the body and increases vulnerability to infection [22]. Micronutrients (vitamins and minerals) have a significant role in the function of the immune system. Sufficient consumptions of these micronutrients can be got through a daily diet that contains fish, meat, beans and lentils, dairy foods, eggs, strawberries, citrus fruits (e.g., orange and lemon), and vegetables such as spinach and carrots [5]. Moreover to the significance of nutrition in the prevention of COVID-19, nutritional status has a fundamental role for optimum prognosis and can govern the clinical severity of COVID-19 in individuals infected with SARS-COV-2 [23]. Although, in the present scenario, COVID-19 has executed a new set of challenges for the individual to sustain a healthy diet. Self-isolation and lockdown measures may impede the access to fresh food that may lessen the chances to continue eating a healthy diet [20]. There is no single food that will prevent from contracting COVID-19, but eating foods from a diversity of food groups will often be adequate to gain a healthy and balanced diet [22], which assure a robust immune system that is capable to combat the virus [24]. Hence, the role of nutritional status cannot be overpassed.

Mothers were keen that their children got enough water intakes. Similarly, Raja, in 2021, found that 64.8% of children drank enough water during COVID-19 lockdown [17]. Direct relationship between hydration and health has been formerly affirmed. Dehydration can lead to enhanced production of the stress hormone cortisol, which is related to immune suppression [25]. Good hydration supports the body’s immune function. Thus, recommendation for the significance of drinking water, milk, tea, and consuming other food containing water has to be conveyed by healthcare professionals and dietitians through the COVID-19 pandemic [5].

Consumption of dietary supplements by mothers went in parallel with their children. They were used after physician’s consultation. Hanbazza and Wazzan, in 2021, found that 23% of the children administered supplements during COVID-19 which be considered lower than our results [26]. Micronutrients participate to the function of the immune system through a variability of pathways in both innate and adaptive immune responses. Vitamins C and E, alongside with zinc and selenium, defend against free radical damage during intensification of oxidative stress. In addition, these nutrients have an effect on the antibody production and function. At present, they have antimicrobial activity and control the inflammatory response [27]. It was proposed that vitamin D could have an important role in decreasing the risk of COVID-19 [28].
as well as probable severe consequences of COVID-19 [29].

Therefore, dietary supplements have to be provided to individuals who actually have deficiencies of micronutrients, for example, some individuals in whom, diet only might not be adequate to attain the consumption of these nutrients [22].

About one-third of the respondents succeeded in setting a specific time for their children to go to bed, though 84% of them stated that their children slept 8 h per day. More than a quarter of the participated mothers could not limit screen time. This is in agreement with other studies.

Increased free time for the youth has led to increased leisure screen time and social media than before the COVID-19 outbreak in Canadian children and youth [30], and Indian adolescent [31]. Furthermore, Hanbazaza and Wazzan, in 2021, found that 75% of the parents reporting their children spending 3 h or more time playing video games during COVID-19 curfew [26]. Fibr, in 2020, also reported an alteration in patterns of sleep from their global community. They disclosed that people are going to bed later and attaining more sleep than usual since the COVID-19 outbreak [32]. An ominously later bedtime in quarantine was seen more obvious in young people; the time to get up was also later in confinement. Furthermore, there was increased use of screens in the evening [33].

Sleep has an important effect on the immune system through the action of centrally produced cytokines that are adjusted during sleep, so insufficient sleep has been associated with suppressed immune function [1]. A current review accomplishes that not only the risk of infection but also the severity of infection with SARS-COV-2 are affected by the quality of sleep [34]. Therefore, it is important to maintain a proper quality of sleep in containment to sustain immune function.

More than one-third of the participated mothers stated that their children did not practice any physical activity, and more than a quarter of them reported that their children have no chance for sun exposure during COVID-19 quarantine. This is in agreement with other studies. Hanbazaza and Wazzan, in 2021, and Maximova et al., in 2022, reported that the majority of children had a decrease in physical activity during COVID-19 lockdown [26], [35]. Furthermore, Hartley et al., in 2020, reported that exposure to daylight has declined to <1 h per day through quarantine [33].

Lessening in physical activity and increased sedentary behaviors through COVID-19 confinement could be related to a greater degree of adverse consequences, for example, impairment of immune function, poor quality of sleep, and lower well-being [36]. Consequently, the significance of physical activity through COVID-19 lockdown and sustaining the recommended levels of exercise has been lately highlighted to alleviate the harmful outcomes of physical inactivity on the immune system [1]. Parents should start novel activities and hobbies and motivate their children to play and be active while following rules on physical distancing [30].

Diminished exposure to sunlight during COVID-19 confinement could lessen levels of vitamin D which is chiefly produced endogenously through exposure of the skin to ultraviolet B irradiation [37]. Vitamin D deficiency has been related to vulnerability to infection, mostly respiratory infections [38].

**Strengths and limitations of the study**

The strengths of the present study are the inclusion of different health behaviors for children and their mothers, and the timing of data collection relative to lockdown. The main limitation of the present study was that, people were not acquainted to this type of research, so there was a great disagreement to participate from the start in spite of the great effort done by all team members to communicate with the mothers. Furthermore, we could not reach to participants with different socioeconomic status.

**Conclusion**

This study demonstrated that COVID-19 pandemic has resulted in substantial alterations in daily life and health behaviors for children and their families as a result of measures of restrictions. These modifications comprised hand washing practices, food hygiene, dietary habits, social life, alterations in bed time and walking up, reduced physical activity, insufficient exposure to daylight, and incapability to limit screen time.

**Recommendation**

It is emphasized to sustain good hand washing behaviors and making it a social custom during COVID-19 and beyond. Furthermore, a balanced and healthy diet is significantly needed through the existing situation to guarantee a healthy immune system. Parents should continue to set routines for their children, embracing regular sleep and wake times, and supervised time for screens, and they should integrate physical activity into the daily routine of children. More studies about the influences of dietary supplements on effects related to COVID-19 are needed.

**References**

PMid:32879542

PMid:32613821

PMid:32142626


PMid:32653030


PMid:32613821

PMid:32513197


PMid:32331344


PMid:16553905

PMid:32502117


PMid:32513197

PMid:33493611


PMid:33235973

PMid:32276799

PMid:32582329


PMid:34909132

PMid:31963293

PMid:32252338


