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Practices of Turkish Mothers on the Use of Supplements, Herbs-Spices and Child Nutrition During the COVID-19 Pandemic Lockdown: A Cross-Sectional Study

Türk Annelerin COVID-19 Pandemisi Sürecinde Takviye Edici Gıda, Bitki-Baharat Kullanımı ve Çocuk Beslenmesi Uygulamaları: Kesitsel Bir Çalışma

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ABSTRACT Objective: The study aimed to examine the practices of mothers regarding the use of supplements, herbs-spices and child nutrition during the coronavirus disease-2019 (COVID-19) pandemic lockdown in a sample of Turkish mothers. **Material and Methods:** This descriptive and cross-sectional was study conducted in Karabük province of Türkiye. Five hundred and sixty five mothers with children aged 2-18 participated in the study. For data collection, a questionnaire was used to evaluate the foods consumed by children and the practices of mothers on child nutrition. Descriptive statistical methods, and the chi-square test for differences between groups in terms of categorical variables was used. **Results:** Eighty-nine percent of mothers had used at least one product to protect their children from COVID-19. While the use of supplements by the mothers was 62%, the use of herbs and spices was 74%. A significant difference was found between the type of product used by the mothers and the state of mothers' being informed about the use of any product (Psupplement<0.001; Pherbs-spices<0.001). **Conclusion:** Especially the mothers who resorted to these products used them without getting any information. In order for parents to access evidence-based information on child nutrition, training given by health professionals in a virtual learning environment is important for mothers to learn proper nutrition practices.

Keywords: Child; COVID-19; spices; nutritional status; medicinal plants

ÖZET Amaç: Bu çalışmada, Türk annelerin koronavirüs hastalığı-2019 [coronavirus disease-2019 (COVID-19)] pandemisi sürecinde takviye edici gıda, bitki-baharat kullanımı ve çocuk beslenmesine ilişkin uygulamalarının incelenmesi amaçlandı. **Gereç ve Yöntemler:** Bu tanımlayıcı ve kesitsel çalışma Türkiye'nin Karabük ilinde yapıldı. Araştırmaya 2-18 yaş arası çocuğu olan 565 anne katıldı. Verilerin toplanmasında çocukların tükettiği besinler ve annelerin çocuk beslenmesine yönelik uygulamalarının değerlendirildiği bir anket formu kullanıldı. Tanımlayıcı istatistiksel yöntemler ve kategorik değişkenler açısından gruplar arasındaki farklar için ki-kare testi kullanıldı. **Bulgular:** Annelerin %89'u çocuklarını COVID-19'dan korumak amacıyla en az bir gıda kullanmıştır. Annelerin takviye edici gıda kullanımı %62 iken, bitki ve baharat kullanımı %74 idi. Annelerin kullandıkları gıda türü ile herhangi bir gıda kullanımı hakkında bilgi sahibi olma durumu arasında anlamlı fark bulundu (Ptakviye edici gıda<0,001; Pbitki-baharat<0,001). **Sonuç:** Özellikle takviye edici gıda ve bitki-baharat kullanımına başvuran anneler hiçbir bilgi almadan bu gıdaları kullanmıştır. Anne babaların çocuk beslenmesi konusunda kanıta dayalı bilgilere ulaşabilmeleri için sağlık profesyonelleri tarafından sanal bir öğrenme ortamında verilen eğitimler, annelerin doğru beslenme uygulamalarını öğrenmeleri açısından önemlidir.

Anahtar Kelimeler: Çocuk; COVID-19; baharat; beslenme durumu; şifalı bitkiler

On March 11, 2020, the World Health Organization (WHO) declared that the novel coronavirus disease-2019 (COVID-19) virus had become a worldwide pandemic.[1] With the closure of schools, parks and other social facilities in many countries, including our country, social activities were terminated and quarantine measures were taken in order to reduce the spread of the virus.[2,3] Quarantine measures may be

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effective in the reduction of the rate of virus transmission and its spread; however, they may have negative effects on children's health.[3,4] One of these negative effects is on nutrition, which is the main determinant of children's health protection.[2,5,6]

The pandemic period may lead to nutritional problems in children due to both the disease itself and the mandatory quarantine practices led by the epidemic.[5] It has been reported that the nutritional habits of children and families may be adversely affected with the increase in the length of time wasted at home due to quarantine practices.[2,3,7] In the literature, it has been reported that the eating routines of families and their children have changed, they consume more snacks, and there has been an increase in the number of meals due to the pandemic.[2,6,7] The pandemic leads to a rise in the consumption of processed foods with high saturated fat, sugar and refined carbohydrates notably in children.[2,6] The pandemic period, along with the rise in the length of time spent at home, leads to increase the length of time wasted on technological devices such as video games and mobile phones, and reduce physical activities.[3,8,9] The risk of obesity and cardiovascular diseases increases due to sedentary life and negative changes in children's eating habits in front of technological devices.[5,10]

Sufficient and balanced nutrition has been proven to be protective in children against infectious diseases.[11] It has also been known that supplements with trace elements such as zinc, selenium and vitamin combinations such as vitamin D and C, nutraceuticals and probiotics have beneficial effects on the immune system and have antiviral effects.[12,13] Therefore, nutritional strategies that boost the immune system have become important in child health during the pandemic period.[5] The unknown aspects of COVID-19 have also led parents to the use of various herbs and herbal products that they have known or practiced before.[14] Various herbs or herbal products are preferred by people for their analgesic, anti-inflammatory or antioxidant effects.[15] Some herbs have also been demonstrated to have immune-boosting properties.[16] One of the most often utilized complementary and alternative medicine strategies is herbal products.[17] However, the fact that the pharmaceutical mechanisms, interactions and adverse reactions of herbs and herbal products along with their therapeutic effects are not fully known make their use limited in children.[18]

It has been reported that the decent nutritional status of children can boost their immune system, and positively affect their physical and psychological health during pandemic.[19] Parental nutrition practices have an important influence on the child's eating behaviors.[2] It is known that nutritional habits show differences related to culture and nationality in which individuals live. During the COVID-19 pandemic, Bahatheg examined the dietary habits of children living in 3 different countries.[20] The nutrition system of Turkish children was better than that of British (western) and Saudi Arabian (eastern) children. It has also been stated that Turkish (eastern and western culture) children eat healthy foods and therefore there is a need for further studies on the nutritional habits of Turkish mothers. In other studies, conducted, it has been reported that the increase in the mothers' level of knowledge on child nutrition has positive effects on child health.[21,22] It is obvious that health professionals have an important role in the evaluation of child nutrition and in the development of mothers' behaviours towards child nutrition during the pandemic period. In this study, it was aimed to examine the practices of mothers regarding the use of supplements, herbs-spices and child nutrition during the COVID-19 pandemic lockdown in Türkiye.

MATERIAL AND METHODS

DESIGN, POPULATION AND SAMPLE

This is a descriptive and cross-sectional study. The study was carried out between March 1 and April 1, 2021 in the province of Karabük, located in the Western Black Sea region of Türkiye. Between these dates, distance education was in practice in Türkiye. The universe of the research consisted of mothers residing in Karabük, literate and having children between the ages of 2-18. The most important criterion for inclusion in the study was that the children were over 2 years old. WHO recommends continuing breastfeeding until the age of 2, in addition to giving additional foods to babies after the sixth month.[23] For this reason, the nutritional status of the children was evaluated except for breast milk intake.

According to Turkish Statistical Institute 2020 Address Based Population Registration Statistics, there were a total of 46,824 children aged 2-18 in Karabük.[24] The minimum sample size to be reached with a 95% confidence interval and a 5% margin of error was calculated as 380 with the known universe sample formula. 575 mothers agreed to participate in the study. However, the sample of the study consisted of 565 mothers, but 3 of the mothers did not give the written/electronic consent on the first page of the participant information form and 7 mothers left the survey without completing the participant information form.

DATA COLLECTION

A questionnaire form designed by the researchers in line with the literature was used to collect data in the study.[2-6,9,12,13,17,20,21,25] The form consisted of 37 questions, 3 of which were open-ended. As well as the introductory features of mothers and children, the food groups that children increased/decreased their intake compared to the pre-pandemic, the supplements that mothers gave to their children to protect them from COVID-19 infection, herbs-spices, information resources of the mothers and the educational issues that mothers needed about nutrition were investigated. Research data were collected through Google Forms (Google LLC, Menlo Park, CA, USA). This form was delivered to mothers via social media [Facebook, Instagram (Meta Inc., California, USA), and WhatsApp (WhatsApp LLC, California, USA)]. The online survey took an average of 15 minutes to fill out.

STATISTICAL ANALYSIS

Data analysis was performed using the SPSS-24 (IBM Corporation, Armonk, NY, USA). Descriptive statistical methods (number, percentage, mean, standard deviation) were used in the evaluation of data. Differences between the groups in terms of categorical variables were examined with the chi-square test. The results were evaluated at a 95% confidence interval and the value of $p<0.05$ was considered to be significant.

ETHICAL CONSIDERATIONS

Before the research, necessary permissions were obtained from the Turkish Republic Ministry of Health, General Directorate of Health Services (protocol no: 2021-02-16T02_15_24) and Zonguldak Bülent Ecevit University Human Research Ethics Committee (date: February 26, 2021, no: 63). On the first page of the on-line questionnaire, the participants were provided with written/electronic informed consent about the purpose of the study, the confidentiality of the data, the voluntary participation, and the possibility of withdrawing from the questionnaire at any time. The study was conducted in accordance with the ethical standards in the Helsinki Declaration of 1975, as revised in 2008.

RESULTS

Data of 565 children and their mothers were obtained in the study. The mean age of the mothers was 37.8±6.87 years (20-60), and the mean age of the children was 8.3±4.67 years (2-18). It was determined that 49% (n=277) of the mothers were university graduates and 21.6% (n=122) had a post graduate education, and only 29.4% (n=166) had a high school education level or below. Of the children, 53.5% (n=302) were male and 8.3% (n=47) had a chronic disease.

Of the mothers, 46.4% (n=262) stated that there was no change in the weight of their children during the pandemic while 39.5% (n=223) stated that they gained some weight; 57.2% (n=323) of the mothers stated that there was no change in their children's diets, 65% (n=367) stated that they did not think of changing or did not change their child's eating habits in order to protect her/him from COVID-19. It was found in the study that 88.7% (n=501) of mothers resorted at least one product to protect their children from COVID-19. While the use of supplements by mothers was 61.6% (n=348), the use of herbs-spices was 73.8% (n=417) (Table 1).

Compared to the pre-pandemic period, the first three products in which the consumption of children increased the most during the pandemic were respectively fruit (40.4%), water (37.5%) and oilseeds such as hazelnut, almond, walnut (37.2%). The 3 products consumption of which decreased the most were found to be fizzy drinks (17.7%), processed/frozen ready-to-eat foods (15.2%), and processed foods such as chips and sweets (13.6%) (Figure 1).

Vitamin D (46.8%), multivitamins (46.5%) and fish oil capsules/syrup (39.9%) were respectively de-

TABLE 1: Opinions and practices of mothers on their children's nutritional status during the pandemic period.

Variables	n	%
Opinions of mothers on their children's weight change		
She/he has gained a lot of weight	56	9.9
She/he has gained some weight	223	39.5
There has been no change in her/his weight	262	46.4
She/he has lost some weight	20	3.5
She/he has lost a lot of weight	4	0.7
Opinions of mothers about how their children's diets have changed		
She/he has started to eat more healthy foods	125	22.1
There has been no change in her/his diet	323	57.2
She/he has started to eat less healthy foods	117	20.7
The state of mothers changing their child's diet to protect her/him from COVID-19		
She is thinking of changing the child's diet	121	21.4
She has already changed the child's diet	77	13.6
She is not thinking of changing the child's diet/she has not changed it	367	65.0
The mother's use of any product to protect her/him from COVID-19		
Yes	501	88.7
No	64	11.3
The state of mothers to use supplements to protect the child from COVID-19		
Yes	348	61.6
No	217	38.4
Mothers' use of herbs and spices to protect their child from COVID-19		
Yes	417	73.8
No	148	26.2

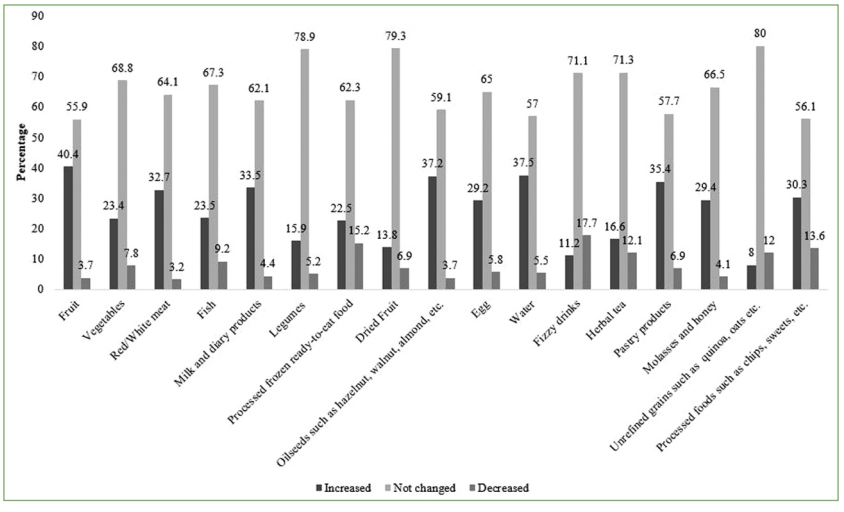

FIGURE 1: Distribution of the products consumed by children during the pandemic period.

termined to be the most frequently used supplements by mothers to protect their children from COVID-19 (Figure 2).

The most common herb-spice products used by mothers were linden (53.7%), onion/garlic (51.1%) and ginger (35.7%), respectively (Figure 3).

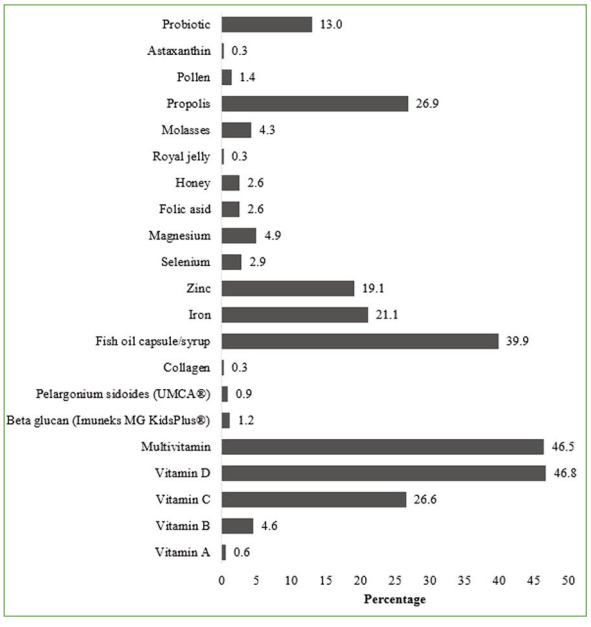

FIGURE 2: Distribution of supplements given by mothers to their children to protect them from COVID-19 infection (multiple options are marked).

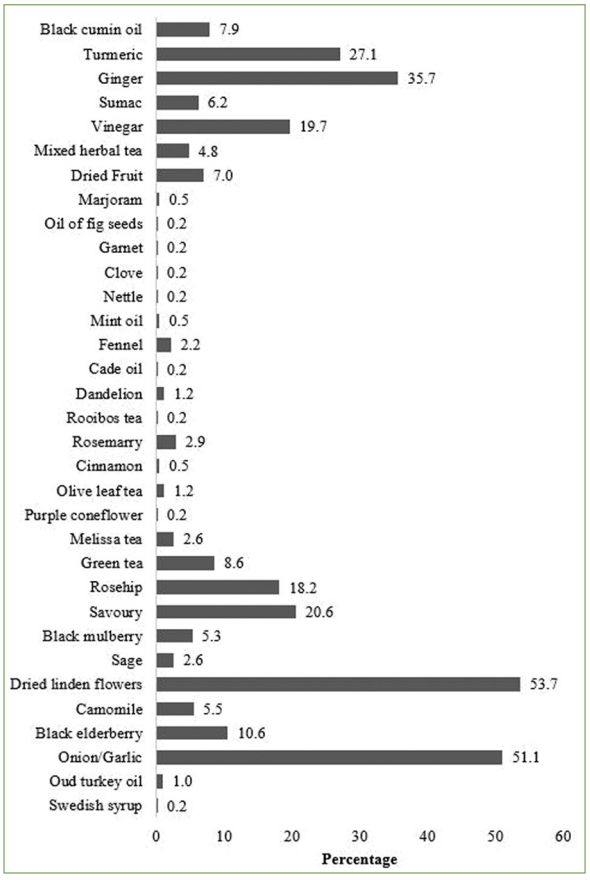

FIGURE 3: Distribution of herbs, herbal drugs and herbal drug preparations given by mothers to their children to protect them from COVID-19 infection (multiple options are marked).

All of the mothers (n=565) had information about child nutrition, 30.4% (n=172) about supplements, and 25.1% (n=142) about the use of herbs and spices from at least a resource. Of the resources that mothers mostly resorted for child nutrition were determined to be doctors (56.6%), internet (56.5%) and relatives/family elders (37.5%). Mothers mostly resorted to doctors (66.3%), pharmacists (47.7%) and internet (36%) for the supplements, and doctors (50.7%), internet (45.8%) and pharmacist (34.5%) for the use of herbs-spices. Of the mothers, 76.3% (n=431) stated that they did not need any training on child nutrition. The issues that 134 (23.7%) mothers in need of training mostly wanted to learn were found to be immune-boosting nutrition (18.7%) and gaining healthy eating habits (18.7%). Other issues that mothers want to learn are loss of appetite (14.2%), meal planning (12.7%), food rejection/selectivity (11.9%), use of supplements (9%), nutrition by age (8.2%), eating disorders (3%), food allergies (3%) and functional nutrition (0.7%).

There was no significant difference between the type of product used by the mothers and the presence of an individual diagnosed with COVID-19 in the family ($P_{supplement}$=0.990; $P_{herbs-spices}$=0.437). A significant difference was found between the type of product used by the mothers and the state of mothers' state of changing the child's eating habits to protect them from COVID-19 ($P_{supplement}$<0.001; $P_{herbs-spices}$<0.001), the state of child's having changes in eating habits during the pandemic period ($P_{supplement}$<0.001; $P_{herbs-spices}$<0.001), the state of mothers' being informed about the use of any product ($P_{supplement}$<0.001; $P_{herbs-spices}$<0.001), the state of need for the training on nutrition ($P_{supplement}$=0.003; $P_{herbs-spices}$=0.006) (Table 2).

DISCUSSION

It is stated that poor, insufficient or overfeeding may be associated with COVID-19.[26] In the literature, the importance given by families to healthy nutrition and weight control, and the behaviour of mothers' supervision of what their children eat due to the concern that their children will gain weight have been reported to increase during the pandemic.[27,28] While more than half of the mothers in our study stated that

TABLE 2: Analysis of mothers' use of supplements and herbs-spices in terms of some variables related to the pandemic process.

Variables	Supplementary product						Herbs-spices					
	User		Non-user				User		Non-user			
	n	%	n	%	χ^2	p value	n	%	n	%	χ^2	p value
Presence of an individual diagnosed with COVID-19 in the family												
Yes	250	71.8	156	71.9	0.000	0.990	296	71.0	110	74.3	0.603	0.437
No	98	28.2	61	28.1			121	29.0	38	25.7		
The state of changing the child's diet to protect her/him from COVID-19												
I am thinking of changing it	75	21.6	46	21.2	16.288	**<0.001**	100	24.0	21	14.2	17.974	**<0.001**
I have changed it	63	18.1	14	6.5			67	16.1	10	6.7		
I am not thinking of changing it/I have not changed it	210	60.3	157	72.3			250	60.0	117	79.1		
Change in the child's eating habits during the pandemic period												
She/he eats more healthy foods	99	28.4	26	12.0	21.065	**<0.001**	108	25.9	17	11.5	21.604	**<0.001**
There is no change	182	52.3	141	65.0			215	51.6	108	73.0		
She/he eats more unhealthy foods	67	19.3	50	23.0			94	22.5	23	15.5		
Getting information for the use of any product												
No	186	53.4	198	91.2	87.694	**<0.001**	259	62.1	125	84.5	25.059	**<0.001**
Yes	162	46.6	19	8.8			158	37.9	23	15.5		
Need for training on nutrition												
No	251	72.1	180	82.9	8.653	**0.003**	306	73.4	125	84.5	7.410	**0.006**
Yes	97	27.9	37	17.1			111	26.6	23	15.5		

there was no change in their children's nutrition during the pandemic period, the rates of children who started healthy or unhealthy diets were similar and at a low level. Despite this result, more than one-third of mothers stated that their child put on weight during the pandemic. In the study conducted by Androutsos et al. in Greece, the body weight gain of children and adolescents were examined during the COVID-19 quarantine, and it was reported that there was an increase in body weight in children (35%), which was similar to our study.[4] In addition, an increase in the body mass index of children was found in many studies conducted during the pandemic period.[9,29]

The mothers within the scope of our study stated that the consumption of healthy foods increased by more than 30% in their children during the pandemic compared to the pre-pandemic period. An increase in the consumption of healthy foods in the diet of children during the pandemic period has been reported in the literature.[2,20,30] In line with the literature, the reason for the increase in healthy food consumption can be explained by the high level of education of the mothers in our study group, the presence of mothers at home due to the quarantine and the preparation of food at home. In another study, parallel with our comments, it was reported that the high level of education of mothers and the increase in the length of time spent at home due to the quarantine resulted in more positive changes in the nutrition of children.[2]

In this study, fizzy drinks, processed/frozen ready-to-eat foods, and processed foods such as chips and sweets are among the products that decrease the most in children's consumption during the pandemic; however, it was observed that there was an increase in the consumption of processed foods such as chips, sweets, and pastry products by more than 30%. In other studies, in line with our study, an increase has been observed in the consumption of pastries, chips, sweets and processed/frozen ready-to-eat foods during the pandemic period.[2,6] It is known that diet with high-calorie, saturated fat-rich and consumption of sugary foods increase the risk of obesity.[4] However, quarantine practices in our country and in many countries have triggered the decrease in physical activity of children and thus the development of obesity.[3,31,32] It is also known that there is a direct relationship between obesity and the serious consequences of COVID-19.[26] In the light of the literature, the increase in children's consumption of these unhealthy foods in our study is thought to pose a risk for COVID-19 and may also lead the children to become obese and experience the negative consequences of obesity.

With the COVID-19, interest about how to protect against this disease and how to boost the immune system best has increased in societies. Therefore, nutritional practices have indicated distinctions.[26] About one in three mothers who participated in the study stated that in order to protect their child from COVID-19 they thought of changing the diet of their child or changed it. However, the rates of mothers who stated that they used supplements and/or herbs-spices to protect their children from COVID-19 were much higher and made up the majority of mothers in the study. This result in the study can be explained by the fact that mothers did not only perceive the use of supplements or herbs-spices as a change in the diet. It was seen that the mothers specified 21 different supplementary products. Although there is no data about the use of these supplements to protect against COVID-19 in children, there are studies showing that supplementation with vitamin C, vitamin B, vitamin D, vitamin E, zinc and selenium minerals boost the immune functions and thus effective in preventing COVID-19.[12,13,33] In another study, it was determined that the vitamin D levels of 780 adults who died due to COVID-19 were lower than the normal reference values.[34]

It was determined in our study that mothers used a wide variety of herbs and spices, the number of which was 33, to protect their children from COVID-19. Limited information is available about the benefits and risks of these products in the pediatric population.[17] In a systematic review examining the side effects of herbal supplements in children, neurological effects in 35% of children, cardiovascular effects in 10%, gastrointestinal effects in 14% and hepatotoxic effects in 11% were reported to be observed.[25] There is also no definite evidence about the preventive effects of these products against COVID-19 infection.[13] Due to their potential risks or adverse effects, it is worrying for the mothers in the study to use so many and various herb-spice products, whose effectiveness is not fully known. Additionally, it was determined in our study that one of every two mothers used linden, onion and garlic. This can be explained by the fact that linden grows in all regions of Türkiye, it is easily accessible by everyone, and linden tea is preferred by most of the Turkish families during the winter months. The use of onion and garlic, on the other hand, can be explained by the fact that they are the foods most families use in the preparation of almost every dish in Turkish cuisine.

It was observed that the mothers in our study received information mostly from doctors and internet in 3 domains: child nutrition, supplementation and herbal spice use. While the majority of mothers who received information from doctors were interpreted as a pleasing result in the study, it was interesting that mothers consulted health professionals such as nurses and pharmacists less than their relatives, family elders and friends, especially regarding child nutrition. Even though the internet is so preferred for information access, we have some concerns about mothers' access to internet resources that contain reliable and evidence-based information. In the study, "immune-boosting nutrition" and "gaining healthy eating habits" were the issues that mothers felt the most need for training. During the COVID-19 pandemic, nutritional methods that boost the immune system of children and are known to be protective against infections have gained importance.[5,11] In line with the

literature, it can be interpreted as an expected result that mothers want to learn about these issues. In the study, the rate of not getting information about the use of any supplements, herbs-spices and no need for training on nutrition were statistically and significantly higher in the mothers who stated that they used supplements and herbs-spices. Mothers in Turkish culture are more sensitive to traditional approaches to child-rearing topics, including child nutrition. For this reason, it is thought that most parents do not consider it necessary to be educated about nutrition and food supplementation because they trust the traditional approach. As it is known that the increase in mothers' knowledge about nutrition has positive effects on child health, the unconscious use of these products can be a potential obstacle to the protection of child health.[21,22]

LIMITATIONS

Due to the cross-sectional design of this study, the generalizability of the research results is limited. In addition, our data collection form included questions about the height and body weight of the children. However, these data could not be evaluated since most of the mothers in the study wrote their children's height and body weight numerically wrong at very extreme values. For this reason, results containing children's body mass indexes during the pandemic and comparisons between children's body mass indexes and their diets could not be included in the study. Also, the online delivery of the data collection form to the participants due to the pandemic conditions caused a limitation in reaching mothers from different sociocultural levels.

CONCLUSION

In the study, it was determined that the pandemic period led to changes in child nutrition and mothers' practices for child nutrition and affected children's weight gain. Compared to the pre-pandemic period, while there was an increase in the consumption of healthy foods such as fruit, hazelnuts, walnuts, milk and dairy products by children, there was an increase in the consumption of unhealthy foods such as fizzy drinks, processed/frozen ready-to-eat foods, and chips, sweets. The mothers stated that they wanted to receive training on "immune-boosting nutrition and gaining healthy eating habits". It was concluded in the study that most of the mothers used different types of supplements and/or herb-spices to protect their children from COVID-19 while the rates of mothers who thought of changing their child's diet or changed it to protect their child from COVID-19 were low. Finally, it was concluded that especially the mothers who resorted to these products used them without getting any information and they did not need any training on nutrition.

Child nutrition is one of the most important parameters for ensuring and maintaining child health. For this reason, health professionals should take an active role in the development of mothers' behaviours towards child nutrition and in provision of children with healty eating habits. When it is considered that parents and children cannot go to health institutions that are the resources of information during the pandemic period, and mothers get information from the internet, it is suggested that web-based trainings where the health professionals can guide parents about the access to evidence-based information regarding child nutrition be planned.

For future studies, a sample consisting of children and mothers living in different countries can be designed and it can be investigated whether nutritional behaviors and especially the use of supplements and herbal species show differences. In addition, studies to compare children's nutritional behaviors with their physical activity status and anthropometric measurements may be conducted.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Özlem Öztürk Şahin, Aysel Topan;* ***Design:*** *Yeliz Taşdelen, Beyza Uçar, Zeynep Aközlü;* ***Control/Supervision:*** *Özlem Öztürk Şahin, Aysel Topan;* ***Data Collection and/or Processing:*** *Beyza Uçar, Zeynep Aközlü, Yeliz Taşdelen;* ***Analysis and/or Interpretation:*** *Zeynep Aközlü;* ***Literature Review:*** *Beyza Uçar, Zeynep Aközlü, Yeliz Taşdelen;* ***Writing the Article:*** *Özlem Öztürk Şahin, Aysel Topan, Beyza Uçar, Yeliz Taşdelen, Zeynep Aközlü;* ***Critical Review:*** *Öztürk Şahin, Aysel Topan;* ***References and Fundings:*** *Beyza Uçar, Yeliz Taşdelen, Zeynep Aközlü.*

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