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Özgün Çalışma / Original Article

Dietary Supplements And Functional Food In Children During Covid-19 Pandemic

Covid-19 Salgını Sırasında Çocuklarda Diyet Takviyeleri Ve Fonksiyonel Gıdalar

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ÖZET

AMAÇ: COVID-19 pandemisi sırasında çocuklarda diyet desteği kullanım olasılığı ile ilgili veriler, yetişkinlere kıyasla azdır ve iyi belgelenmemiştir. Bu anket çalışmasında, 6-18 yaş arası çocuk ve ergenlerde pandemi kaynaklı beslenme davranışındaki değişikliklerin öngörücülerini ortaya çıkarmakı amaçlandı.

GEREÇ VE YÖNTEM: 6-18 yaş arası toplam 1327 çocuğun ebeveynlerinden, COVID-19 pandemisi öncesinde ve sırasında çocuklar tarafından yaygın diyet takviyeleri ve/veya geleneksel fonksiyonel gıdaların kullanımını sorgulayan bir anket doldurmaları istendi. Çocuklar pandemi öncesi/sırasında besin takviyesi alıp almadıklarına göre 4 gruba ayrıldı: Hiç diyet takviyesi almayanlar (Grup 1), halihazırda alanlar/almaya devam edenler (Grup 2), pandemi sırasında almaya başlayanlar (Grup 3), pandemi sırasında almayı bırakanlar (Grup 4).

BULGULAR: Anketi toplam 1327 katılımcı tamamladı. Grup 1'de 322 (%24,3), Grup 2'de 313 (%23,6), Grup 3'te 679 (%51,2) ve Grup 4'te 13 (%1,0) çocuk vardı. Kardeş sayısı (OR:0.747, %95 CI 0.659-0.848, p<0,001), düşük gelir (OR: 0.164, %95 CI 0.112-0.239, p<0,019) ve çocuklarda COVID-19 aşısı (OR:0.694 %95 CI 0.493-0.976, p=0,03), pandemi sırasında diyet takviyesi almaya başlamanın bağımsız öngörücüleriydi. Tüm gruplar arasında en yaygın tavsiye kaynağı doktorlar, hemşire/eczacı, aile/tanıdıkları idi. COVID-19 pandemisinde en çok kullanılan besin takviyeleri D vitamini, balık yağı ve multivitamin, en sık kullanılan fonksiyonel gıdalar/bitkisel ilaçlar ise pekmez, yoğurt/kefir ve sarımsak oldu.

SONUÇ: Orta-yüksek gelirli aileler, pandemi sırasında çocuklarına besin takviyeleri sağlamaya şiddetle meyilliyken, düşük gelirli ve birden fazla çocuğu olan bir ailenin çocuğu olmak, diyet takviyelerine başlamanın önündeki en belirgin engel gibi görünmektedir.

Anahtar kelimeler: COVID-19, çocuklar, diyet takviyeleri, fonksiyonel gıda

ABSTRACT

AIM: Data on the likely interest in dietary support use in children during the COVID-19 pandemic are scarce and not well documented, compared to adults. In this survey study, we aimed to reveal predictors of pandemic-induced changes in nutritional behavior in children and adolescents.

MATERIAL AND METHODS: Parents or caregivers of a total of 1327 children aged 6 to 18 years were requested to fill a survey questioning the use of common dietary supplements and/or conventional functional food by children before and during the COVID-19 pandemic. Children were divided into 4 groups according to whether they received dietary supplements before/during the pandemic: those never received dietary supplements (Group 1), those already receiving/continued to receive (Group 2), those started to receive during pandemic (Group 3), those stopped to receive during pandemic (Group 4).

RESULTS: A total of 1327 respondents completed the questionnaire. There were 322 (24.3%) children in Group 1, 313 (23.6%) children in Group 2, 679 (51.2%) children in Group 3 and 13 (1.0%) children in Group 4. Number of siblings (p<0.001), low income (p<0.019) and COVID-19 vaccination in child (p=0.03) were the independent predictors of starting to receive dietary supplements during pandemic. The most dietary supplements used during the COVID-19 pandemic are vitamin D, fish oil and multivitamin. The most frequently used functional foods/herbal medicines were grape molasses, yogurt / kefir and garlic.

CONCLUSION: Moderate-to-high-income families were strongly inclined to start providing their children with dietary supplements during the pandemic, whereas being the child of a low-income family with multiple children seems to be the most prominent barrier to starting dietary supplements.

Key words: Children, dietary supplements, functional food, COVID- 19

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INTRODUCTION

Early in the pandemic, adults were highly affected by the COVID-19 infection. In this period, COVID-19 was perceived as an adult-specific health problem, as children were protected well with fewer outdoor activities and less international travel that they less likely contacted the virus. Also, low viral receptor maturation in children was suggested to cause a mild course of the disease (1). In a report by the United States Centers for Disease Control and Prevention in mid-2020, only 4.5% of the over 2,000,000 laboratory confirmed cases were children under the age of 18 (2). **S**ince any specific vaccine was not developed and patient-care experience was low, the disease was severe and even fatal, especially in the elderly with certain comorbidities (3). The prolonged quarantine period and the absence of a specific treatment for the disease have increased society's interest in nutritional supplements, functional foods and healing agents for well-being and strengthening immunity (4).

The unending pandemic process has worsened socioeconomic conditions in the low-to-moderate income fraction, increased psychological distress in families, and has placed a disproportionate psychosocial burden on women caring for young children. Some global reports pointed out that during the COVID-19 process, children have nutritional problems due to caregiver anxiety and economic reasons (5). Moreover, in the past year, with the removal of social restrictions and the return of children to schools, the case-positive rates in children have increased from 13.4% to 19.0%, and the overall prevalence from 4524.8 per 100,000 children to 170.060 per 100,000 children, according to the most recent American Academy of Pediatrics data (6). COVID-19 infection has now become a significant health threat in children as well. Since there is still no specific treatment for the disease, it is likely that parents have started to use nutritional supplements excessively to protect their children's immune system and well-being (7). However, data on the likely interest in nutritional support use in children during the COVID-19 pandemic are scarce and not well documented, compared to adults (8).

In this study, we questioned the use of nutritional supplements and functional food in children between 6-18 years before and during the pandemic. Children were divided into 4 groups according to whether they received dietary supplements before/during the pandemic (no supplements, continued supplements, started supplements and stopped supplements during pandemic). We aimed to reveal socioeconomic and demographic characteristics that distinguish children who started to receive nutritional support during the pandemic period from children who did not receive support at all or children who were already receiving support.

MATERIAL AND METHOD

The study was approved by the institutional review board of Ankara Training and Research Hospital (approval number: 21/805). Subjects included in this survey study were children and adolescents aged 6 to 18 years presenting to the pediatrics department of a tertiary referral hospital with any complaint or for a health check. The survey was developed by the researchers of the study, and it was prepared in Turkish language, therefore it was a prerequisite that respondent had no language barrier. Children were excluded if they had chronic diseases including asthma, tuberculosis, cancer or hematologic malignancy, or had severe cognitive impairment due to chromosomal abnormality or autism. Children were also excluded if they required comprehensive diagnostic work-up and treatment for active systemic infection, organ failure, nutritional deficit due to swallowing disorder or malabsorption, or worsening of pre-existing inherited metabolic disorder. The study surveyed primary caregivers (i.e., parents, grandparents or orphanage caretaker responsible for basic needs and care) of the children whether children received dietary supplements or conventional functional food before and during the COVID-19 pandemic, as well as how often and for what benefit they received these supplements. Respondents were requested to fill out a structured survey questionnaire consisting of open-closed mixed questions about which of the commonly used dietary supplements and/or conventional functional food options were used by the children before and during the pandemic. The survey also gathered baseline information including identity, demographic and familial characteristics, socio-cultural status and monthly income level, as well as whether children's family members had COVID-19 during the pandemic or died from severe illness from COVID-19. The survey initially asked a "Yes or No" question to the respondents simply about their status of receiving dietary supplements or functional food before the pandemic and during the pandemic. Children were divided into 4 groups according to whether they received dietary supplements before/during the pandemic; those never received dietary supplements (Group 1), those already receiving/continued to receive (Group 2), those started to receive during pandemic (Group 3), those stopped to receive during pandemic (Group 4). A multinominal regression analysis was applied to determine the distinguishing features of children who did not receive supplements regularly but started during the pandemic.

Statistical analysis

Statistical Package for Social Sciences (SPSS) version 19 was used for analyses. Continuous variables were expressed as mean ± standard deviation and categorical variables were presented as n (%). Normal distribution of the continuous parameters was tested using visual histograms and Kolmogorov-Smirnov test or Shapiro-Wilk test. Group 4 was not included in the comparative analyses, due to the small number of children in this group. To reveal the difference in baseline characteristics, vaccination data and frequency of COVID-19 infection in children's family members and second-degree relatives among groups Kruskal-Wallis independent samples test was used for comparison of continuous parameters and chi-squared test was used for comparison of categorical parameters. Comparison of source of advice and use of dietary supplements, functional food, or herbal medicines between Group 2 and Group 3 was performed using chi-squared test. For categorical variables, Fisher's exact test was used when one or more cells in the contingency table had counts of less than 5. A univariate multinomial regression analysis was applied to determine the distinguishing features of children who did not take supplements regularly but started during the pandemic, with the Group 1 being the reference category. An adjusted multivariate multinominal regression analysis was applied to find the independent predictive effect of the variables that were significant in the univariate analysis. A p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 1327 respondents completed and submitted the questionnaire. There were 322 (24.3%) children in Group1, 313 (23.6%) children in Group 2, 679 (51.2%) children in Group 3 and 13 (1.0%) children in Group 4. Comparison of baseline and demographic characteristics of the groups were presented in

Table 1. Baseline characteristics of the participants (n=1314) [n (%)] (Group 4, stopped to receive, [n=13, 1%] not included)

Variable	Group 1 (Never Received)	Group 2 (Already receiving/ Continued to receive)	Group 3 (Started to receive)	P value
N (%)	322 (24.5%)	313 (23.8%)	679 (51.7%)	
Age (years)	12.61±3.14	12.10±3.27	12.38±3.08	0.14
Females	168 (52.2%)	176 (56.2%)	371 (54.6%)	0.58
School grade				
Primary school (First 4 years)	67 (20.8%)	98 (31.3%)	158 (23.3%)	0.005
Secondary school (Second 4 years)	120 (37.3%)	94 (30.0%)	245 (36.1%)	0.10
High school (Third 4 years)	135 (48.9%)	121 (38.7%)	276 (40.6%)	0.69
Number of siblings				
None	32 (9.9%)	65 (20.8%)	111 (16.3%)	0.001
1	82 (25.5%)	145 (46.3%)	348 (51.3%)	<0.001
2	106 (32.9%)	69 (22.0%)	127 (18.7%)	<0.001
≥3	102 (31.7%)	34 (10.9%)	93 (13.7%)	<0.001
Mother's level of education				
Uneducated	31 (9.6%)	11 (3.5%)	7 (1.0%)	<0.001
Primary -secondary school	196 (60.9%)	98 (31.3%)	247 (36.4%)	<0.001
High school	72 (22.4%)	115 (36.7%)	337 (49.6)	<0.001
University	23 (7.1%)	89 (28.4%)	88 (13.0)	<0.001
Father's level of education				
Uneducated	18 (5.6%)	6 (1.9%)	4 (0.6%)	<0.001
Primary -secondary school	176 (54.7%)	85 (27.2%)	161 (23.7%)	<0.001
High school	98 (30.4%)	105 (33.5%)	354 (52.1%)	<0.001
University	30 (9.3%)	117 (37.4%)	160 (23.6%)	<0.001
Income level of the family				
Low income	179 (55.6%)	52 (16.6%)	75 (11.0%)	<0.001
Moderate income	121 (37.6%)	149 (47.6%)	420 (61.9%)	<0.001
High income	22 (6.8%)	112 (35.8%)	184 (27.1%)	<0.001

Mean age (p=0.14) and distribution of gender (p=0.58) were similar among three groups. The distribution of children's school grades among the three groups was similar, except that being in primary school was significantly more frequent in Group 2 than in the other groups (p=0.005). Number of siblings was significantly different among groups; being an only child (p<0.001) or having only 1 sibling (p<0.001) was significantly less frequent in Group 1 compared to Group 2 and Group 3, whereas having 2 siblings (p<0.001) and

having 3 or more number of siblings (p<0.001) was significantly more frequent. Uneducated (p<0.001) and low-educated (p<0.001) mothers and fathers were more common in Group 1 compared to Group 2 and Group 3. Parents with high school degrees are more common in Group 3 (p<0.001), while parents with university degrees are more common in Group 2 (p<0.001). Income level of the families were also significantly different; in Group 1, low income families were significantly more common and those with a high income were significantly less common in Group 1 compared to Group 2 and Group 3 (p<0.001).

Table 2. Vaccination data and frequency of COVID-19 infection in children's family members and second-degree relatives [n (%)]

Variable	Group 1 (Never Received)	Group 2 (Already receiving/ Continued to receive)	Group 3 (Started to receive)	P value
COVID -19 vaccination				
Child	79 (24.5%)	106 (33.9%)	236 (34.8%)	0.004
Mother	267 (82.9%)	283 (90.4%)	615 (90.6%)	0.001
Father	273 (84.8%)	274 (87.5%)	595 (87.6%)	0.42
Chronic disease				
Asthma	10 (3.1%)	15 (4.8%)	23 (3.4%)	0.45
Epilepsy	3 (0.9%)	2 (0.6%)	8 (1.2%)	0.72
Diabetes	3 (0.9%)	0 (0.0%)	3 (0.4%)	0.21
COVID -19 infection in child	131 (40.7%)	85 (27.2%)	247 (36.4%)	0.001
Tobacco use	7 (2.2%)	8 (2.6%)	13 (1.9%)	0.80
COVID -19 infection in family members/relatives				
At least one of the family members*	84 (26.1%)	64 (20.4%)	139 (20.5%)	0.10
At least one of the second -degree relatives**	56 (17.4%)	40 (12.8%)	186 (27.4%)	<0.001
All family members	71 (22.0%)	44 (14.1%)	84 (12.4%)	<0.001
None of the family members	111 (34.5%)	165 (52.7%)	270 (39.8%)	<0.001
COVID -19 associated hospitalization in family members/relatives	78 (24.2%)	31 (9.9%)	94 (13.8%)	<0.001
COVID -19 death in family members/relatives	40 (12.4%)	5 (1.6%)	37 (5.4%)	<0.001

*Individuals living in the same household including mother, father, siblings etc.
**Second -degree relatives that does not sharing the same household including, grandparents, uncles, aunts, nephews, nieces etc.

presents vaccination data and COVID-19 infection in children and family. Vaccination rates of children (p=0.004) and mothers (p=0.001) in Group 1 were significantly less frequent compared to other groups. COVID-19 infection was significantly less common in Group 2, compared to Group 1 and Group 3 (p=0.001). COVID-19 associated hospitalization (p<0.001) and death (p<0.001) were significantly more common in Group 1 compared Group 2 and Group 3.

The most common source of advice across all groups are physicians, nurse/pharmacist, family/acquaintances are listed in table 3.The most dietary supplements used during the COVID-19 pandemic are vitamin D, fish oil and multivitamin. The most frequently used functional foods/herbal medicines were grape molasses, yogurt/kefir and garlic in children. Physicians were the most frequent source of advice in both Group 2 and Group 3 who used supplements during the pandemic, and the frequency was not significantly different (p=0.83). Nurses/pharmacists were significantly more frequent source of advice in Group 3 (p<0.001), while family / acquaintances were more frequent in Group 2. The frequency of dietary supplements used in the pandemic between Group 2 and Group 3 was generally similar, with a few differences

Table 3. Source of advice and use of dietary supplements, functional food, or herbal medicines [n (%)]

Variable	Group 1 (Never Received)	Group 2 (Already receiving/ Continued to receive)	Group 3 (Started to receive)	P value
Source of advice				
Physician	-	142 (45.4%)	313 (46.1%)	0.83
Nurse / Pharmacist	-	58 (18.5%)	205 (30.2%)	<0.001
Television	-	13 (4.2%)	38 (5.6%)	0.33
Internet	-	18 (5.8%)	57 (8.4%)	0.14
Social media	-	10 (3.2%)	19 (2.8%)	0.73
Family / Acquaintances	-	72 (23.0%)	45 (6.6%)	<0.001
Nobody	-	0 (0.0%)	2 (0.3%)	0.98
Dietary supplements used during COVID -19 pandemic				
Multivitamin	-	147 (47.0%)	220 (32.4%)	<0.001
Vitamin D	-	278 (88.8%)	623 (91.8%)	0.13
Fish oil	-	149 (47.6%)	306 (45.1%)	0.45
Fish oil + multivitamin	-	42 (13.4%)	115 (16.9%)	0.15
Vitamin C	-	61 (19.5%)	147 (21.6%)	0.43
Zinc	-	34 (10.9%)	73 (10.8%)	0.95
Zinc + vitamin D	-	20 (6.4%)	39 (5.7%)	0.68
Immune stimulators (beta -glucan or pelargonium sidoides)	-	23 (7.3%)	33 (4.9%)	0.11
Probiotics, Prebiotics	-	15 (4.8%)	7 (1.0%)	<0.001
Other	-	6 (1.9%)	4 (0.6%)	0.06
Functional foods / herbal medicines				
Garlic	-	159 (50.8%)	314 (46.2%)	0.18
Grape molasses	-	242 (77.3%)	485 (71.4%)	0.05
Black Seeds	-	89 (28.4%)	203 (29.9%)	0.63
Herbal tea / green tea	-	103 (32.9%)	241 (35.5%)	0.42
Vinegar	-	62 (19.8%)	119 (17.5%)	0.38
Honey	-	176 (56.2%)	256 (37.7%)	<0.001
Yogurt / Kefir	-	237 (75.7%)	470 (69.2%)	0.03
Cinnamon	-	82 (26.2%)	127 (18.7%)	0.007
Turmeric	-	52 (16.6%)	100 (14.7%)	0.44
Ginger	-	72 (23.0%)	159 (23.4%)	0.88
Sumac	-	30 (9.6%)	22 (3.2%)	<0.001
Propolis	-	39 (12.5%)	65 (9.6%)	0.16
Other functional food	-	58 (18.5%)	98 (14.4%)	0.09

Table 4. Multinominal logistic regression analysis:Univariate and multivariate adjusted predictors of "started to receive" (Group 3) with "never received" (Group 1) being the reference category

	Started to receive supplements during pandemic	
	Univariate	Multivariate
Variable	OR (95% CI) P value	OR (95% CI) P value
Age (years)	0.977 (0.936 -1.019) 0.27	
Females	0.906 (0.694 -1.181) 0.46	
Number of siblings	0.630 (0.560 -0.709) <0.001	0.721 (0.639 -0.814) <0.001
Mother's level of education< high school	0.250 (0.188 -0.333) <0.001	
Father's level of education<high school	0.212 (0.159 -0.281) <0.001	
Income level of the family (per month)<300 €	0.099 (0.072 -0.137) <0.001	0.116 (0.08 -0.12) <0.001
COVID -19 vaccination (Child)	1.639 (1.215 -2.210) 0.001	1.451 (1.041 -2.022) 0.03
COVID -19 vaccination (Mother)	1.979 (1.343 -2.918) 0.001	
COVID -19 vaccination (Father)	1.271 (0.869 -1.860) 0.216	
Chronic disease	1.058 (0.600 -1.866) 0.84	
COVID -19 infection	1.200 (0.914 -1.574) 0.18	
COVID -19 infection in family members/relatives	1.045 (0.937 -1.166) 0.42	
COVID -19 associated hospitalization in family members/relatives	1.989 (1.423 -2.782) <0.001	
COVID -19 death in family members/relatives	2.461 (1.541 -3.932) <0.001	

shows univariate and multivariate predictors of being in the category "started to receive" (Group 3) with the reference of being in the category "never received" (Group 1) in multinominal logistic regression analysis. In univariate

analysis, number of siblings (OR: 0.630, p<0.001), mother's level of education < high school (OR: 0.25, p<0.001), father's level of education < high school (OR: 0.21, p<0.001), low income (OR: 0.09, p<0.001), COVID-19 vaccination in child (0.61, p<0.001) and COVID-19 vaccination in mother (0.50, p<0.001) showed a significantly inverse relationship with being in the category "started to receive", whereas COVID-19 associated hospitalization in family members/relatives (OR: 1.98, p<0.001) and COVID-19 death in family members/relatives (OR: 2.46, p<0.001) showed a proportional relationship. Number of siblings (OR:0.747, 95% CI 0.659-0.848, p<0.001), low income (OR: 0.164, 95% CI 0.112-0.239, p<0.019 and COVID-19 vaccination in child (OR:0.694 95% CI 0.493-0.976, p=0.03) were the independent predictors of being in the category "started to receive" (Group 3).

DISCUSSION

The main purpose of this survey study was to reveal the socioeconomic and demographic characteristics that distinguish children who started to receive nutritional support during the pandemic period from children who did not receive support at all or children who were already receiving support. The study revealed a number of interesting findings, worthy of further investigation in the future.

Our results revealed that the rate of dietary supplement or functional food use in children increased from 25% to 75% during the pandemic and the socioeconomic status of the family and the education level of the parents were highly determinative in whether a child started to receive nutritional support. The rate of children with two or more siblings was significantly higher in the group that never received nutritional support, compared to the other groups. Also, while the children of families with moderate education level and income status made up the majority of the group that started receiving nutritional support during the pandemic, the children of families with higher levels made up the majority of the group that already received nutritional support. Multiple siblings and low income were independent predictors that reduced the likelihood of children starting nutritional support during the pandemic. The DONALD study, which investigated whether there was a change in the nutrient and food intake habits of children and adolescents from high socioeconomic families during the pandemic, reported that there was no significant change in the lifestyles and nutrition of children (7). The contradiction between this study and ours can be attributed to the tendency of families to seek nutritional support for their children as the duration of the pandemic increases, since the study covers only the first three months of the pandemic and ours for the last six months.

We observed that the group that never received nutritional support had the lowest vaccination rate and the highest rate of COVID-19 infection. Also, being vaccinated against COVID-19 was independently associated with an increased likelihood of starting nutritional support during the pandemic, suggesting that the families of children who never received nutritional support, did not/could not adequately protect themselves and their children from the COVID-19 infection. Supporting this, recent studies have demonstrated that socioeconomic disparity is quite an obstacle to the effective protection of children from COVID-19 infection and its adverse life consequences. Martins-Filho et al. reported that the incidence of COVID-19 in children varies significantly in different regions of Brazil, and mortality rates are strongly correlated with social and economic status (9). Thomas et al., in their Inventory study on NICHD Study of Early Childcare and Youth Development participants, aimed to determine the sociodemographic characteristics of individuals most exposed to COVID-19 related stressful life events. The authors reported that women were more prone to stressful life events, and each unit increase in socioeconomic wealth resulted in a 17% to 21% reduction in the number of stressful life events across different domains (10).

The effect of the psychosocial stress that women, especially those who care for young children, are exposed to due to the lockdown in the pandemic, on the nutritional quality of children has been the subject of research (11,12). While a recent review has extracted some data suggesting that children and young adolescents are on a more nutritious diet during the pandemic, this has not been associated with parental anxiety (5). In our study, the close relatives of children who started to receive nutritional support during the pandemic had a higher rate of COVID-19 positivity, as compared to other groups. This finding suggests that parents' anxiety about protecting their children from COVID-19 may be an important factor in their tendency to use nutritional support.

The preference of functional foods was similar between the two groups, and we found that traditional and easily accessible foods specific to our country were the most preferred ones. The most commonly used dietary supplements during the pandemic period were vitamin D, followed by multivitamin, fish oil and vitamin C. The use of zinc and pro/prebiotics, although scientifically popular recently, was minimal in both groups. In line with these findings, a worldwide Google Trends analysis showed that vitamin D, vitamin C, and zinc were the most popular nutrients, with the use of any of the other compounds not exceeding 5%. The study noted that customers around the world lack science-based information and advice on nutrient use. In our study, although doctors are the most frequent source of advice, both in children who are already receiving nutritional support and in those who have started to receive support during the pandemic, one-third of children started to receive nutritional support without consulting a health professional.

The results presented here are subject to some limitations. First, the questionnaires were not answered by the subjects (i.e. children), but by their parents or caregivers. We consider that this design limitation does not affect our main conclusions, that socioeconomic status is the most important factor in initiating dietary supplementation. Second, detailed knowledge of which supplement or food was used in what quantity and for how long was lacking, and this could yield more targeted results for future studies. Finally, the study did not adequately address nutritional behaviors for children during the early and most stressful periods of the pandemic, as it questioned nutritional behavior later in the pandemic, after the lockdown was over.

In conclusion, moderate-to-high-income families were strongly inclined to start providing their children with dietary supplements during the pandemic, whereas being the child of a low-income family with multiple children seems to be the most prominent barrier to starting dietary supplements. Parents' care about their children's health and their level of concern and sensitivity about the COVID-19 pandemic can also be important drivers and deserve further research.

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