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Parents' habits of using food supplements for their children: The impact of the COVID-19 pandemic process use of nutritional supplements in children during COVID-19

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ABSTRACT: This study aimed to evaluate the relationship between the habits of parents with primary school children to use nutritional support for their children before and during the COVID-19 pandemic, and the mental and psychosomatic effects of COVID-19 with a holistic approach. In the study, the "Information Form", which includes the demographic characteristics of the individuals and the use of nutritional support before and during the COVID-19 pandemic, and the "Scale for Evaluating the Mental and Psychosomatic Effects of the COVID-19 Pandemic on Parents", were applied using face-to-face interview technique. The study was carried out with the participation of a total of 280 individuals, 207 women, and 73 men. At the end of the study, it was observed that the use of nutritional support by parents for their children increased during the pandemic. It has been determined that the most preferred dietary supplements during the pandemic process are vitamin D, fish oil, and vitamin C. It has been determined that parents used the nutritional supplements most by obtaining them from the pharmacy on the recommendation of the doctor before and during the pandemic. In the study, it was determined that parents were concerned about the transmission of the virus to themselves and their children, resulting in death, and experienced psychological stress. Taking into account the psychological effects of the COVID-19 epidemic, it can be said that the habits of using nutritional support for their children are affected by psychological stress. Reducing the mental effects of COVID-19 is believed to be important for parents to choose the right nutritional supplements for their children.

KEYWORDS: COVID-19; children; child development; the mental impact of COVID-19; food supplement; vitamins.

1. INTRODUCTION

Coronavirus disease-2019 (COVID-19), caused by the SARS-CoV-2 virus, has become a major public health problem affecting the entire world [1]. In studies conducted with the emergence of the pandemic, it has been observed that COVID-19 causes individual and social problems and affects people's daily lives physically and mentally [2]. The restrictions applied with the epidemic have also changed the eating habits of individuals. The nutritional levels of people are accepted as an indicator of the resistance of individuals to diseases.

In addition to the cytokine and complement system, cellular immunity plays an important role in viral infections. In the prevention of viral infections, nutrition should be supported with foods rich in vitamins, minerals, and antioxidants. Various studies show that fruits and vegetables rich in these sources will strengthen immunity [3]. Antioxidant nutrition and vitamin D consumption, regular intake of prebiotics and probiotics [4], and a zinc-containing diet are also recommended against bacterial and viral infections [5].

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Studies have shown that vitamins have a significant effect on the healthy functioning of the host immune system during the prevention and treatment of COVID-19 [6]. Therefore, there is increasing interest in vitamins and nutritional supplements as part of the supportive treatment of COVID-19 [7].

What is needed in the education system to create schools that support children's healthy development is an environment of safe relationships [8]. Designed to provide environments for healthy development, including consistent, well-designed teaching of 21st century skills and services that meet the needs of all children [9]. A change in the child's living space will also result in a change in the child's developmental process [10]. The ongoing Coronavirus (COVID-19) pandemic has had a significant impact on educators, both teaching and administrative staff. In addition, the situation has also had a detrimental effect on students in certain contexts [11,12]. One of the most important factors that directly affect the child's social behavior, physical, and emotional development is adequate and balanced nutrition according to his age, gender, and activity. Inadequate and unbalanced nutrition in childhood, when combined with infectious diseases, causes growth retardation and increased infant and child mortality. It is known that increasing prohibitions, school closings, and isolation processes negatively affect both parents and children [13,14]. It is thought that parents' instinct to protect their children against infections has increased during the pandemic process compared to pre-COVID-19. Accordingly, it is predicted that parents may experience a change in the habits of using nutritional supplements for their children, which may lead to unconscious consumption.

This study aimed to determine the effects of the nutritional support preferred by parents of primary school children for their children before and during the COVID-19 pandemic and the effects of the mental changes they experienced due to COVID-19 on their nutritional support choices.

2. RESULTS

This study was conducted with a total of 280 adult individuals, 73 (32.8%) men and 207 (67.2%) women, residing in Istanbul, aged 22-57 years. The information about parents in the demographic data (parental age, parental occupation, level of parental education) is in Table 1; information about the child (child age and gender) is given in Table 2.

The mean age of all the participants in the study was 39.7±6.8 years. The mean age of male individuals (42.4±5.6 years) is higher than that of female individuals (38.7±5.9). 69% of the women who participated in the study and 51% of all the individuals who participated in the study are housewives. 48% of the individuals participating in the study are in high school or below, and 52% are university and graduate graduates. Furthermore, according to the degree of closeness, it was determined that 205 of the participants were mothers, 73 were fathers, and 2 were older sisters.

Parents who participated in the study; It was determined to have 152 girls (54.3%) and 128 boys (45.7%) aged 7-11 years. The mean age of the children was 8.84±0.95 years. The mean age of girls (8.9±0.97 years) is higher than that of boys (8.8±0.9 years).

The findings of the COVID-19 pandemic information are in Table 3; The findings showing the habits of parents to use nutritional support for their children before and during the COVID-19 pandemic are given in Table 4, and the statistical comparisons in the "Scale for Evaluating the Mental and Psychosomatic Effects of the COVID-19 Pandemic" are given in Table 5.

Table 1. Distribution of parents' age, occupation and educational status by groups.

		Gender					
		Female (n=207)		Male (n=73)		Total (n=280)	
		n	%	n	%	n	%
Age Range (years)	22-30	15	7	0	0	15	5
	31-40	116	56	29	40	145	52
	41-50	74	36	37	51	111	40
	51-57	2	1	7	10	9	3
Occupation	Housewife	142	69	0	0	142	51
	Officer	13	6	11	15	24	9
	Teacher	24	12	10	14	34	12
	Employee	2	1	11	15	13	5
	Self-Employment	11	5	18	25	29	10
	Other	15	7	23	32	38	14
Education	Illiterate	1	0	0	0	1	0

Status	Primary school	27	13	3	4	30	11
	Middle school	22	11	5	7	27	10
	High school	60	29	16	22	76	27
	University	65	31	31	42	96	34
	Vocational School	26	13	5	7	31	11
	Master, Ph.D.	6	3	13	18	19	7

Table 2. Age information of children.

		Gender					
		Female (n=152)		Male (n=128)		Total (n=280)	
		n	%	N	%	n	%
Age Range (years)	7	7	5	9	7	16	6
	8	52	34	45	35	97	35
	9	49	32	40	31	89	32
	10	37	24	34	27	71	25
	11	7	5	0	0	7	3

3. DISCUSSION

Studies conducted in Türkiye and around the world reveal that the mental changes caused by the COVID-19 pandemic, which is now accepted, affect many areas of life. In particular, the psychological pressure and anxiety caused by the disease have brought the instinct to protect the family of individuals to the fore. The importance of the immune system has once again, as the rates of contracting COVID-19 and the resulting death are higher in individuals with weakened immune systems. For this reason, people have turned to healthy nutrition for themselves and their children to strengthen their immune systems in this process. While there are many studies on the habits of use of nutritional supplements, which are part of healthy nutrition in the pre-pandemic period, studies on the habits of parents using nutritional supplements for their children are limited. In the study, the habits of the people to use nutritional supplements for their children before and during the pandemic were determined. Furthermore, the study was an original study that revealed the effect of the mental effects of the pandemic process on parents' decisions to choose, acquire, and use nutritional supplements for their children. For this reason, the study adds innovation to the literature.

The mean age of the individuals participating in the study was 39.7±6.8 years, and the average age of their children was 8.84±0.95 years. According to the Türkiye Nutrition and Health Survey (TBSA) 2019 data; It has been reported that 48.8% and 35.2% of men and female individuals aged 15 and over, respectively, had high school or higher education [15]. Consequently, although 51% of the parents who participated in the study were housewives, it was determined that their education level was higher than the general profile of Türkiye.

43% of the 280 people who participated in the study during the pandemic period are themselves involved in the pandemic process; 11% reported that their children were diagnosed with COVID-19. In the study, the rate of catching COVID-19 in individuals and their children is seen to be lower than the rate of catching the disease of their relatives (73%) other than their children. Almost 27% of the individuals participating in the study died of COVID-19. In the study, death rates were low when the number of people diagnosed with COVID-19 and the number of relatives who lost their lives. The effect of vaccines on the protection against infections or the reduction of the severity of infections can be measured by mortality rates. Considering that the period in which the study was conducted coincides with the period in which the coronavirus vaccination was started and almost all doses were administered in Türkiye, it is seen that COVID-19 can be controlled with a vaccine. Studies show that COVID-19 vaccines reduce the severe course of the disease, transmission, hospitalization rates, and deaths [16-18].

85% of the individuals who participated in the study declared that they had sufficient information on COVID-19, and 95% of them stated that they followed the mask, social distance, and hygiene rules, which

are among the protection methods during the pandemic process. Taking into account the educational levels of the participants in the study based on these statements, it can be said that the awareness of the choice of protection method they use against COVID-19 is high.

In the study, 81% of the parents were positive about getting vaccinated, and 72% of them were negative about getting their children vaccinated. Although the rate of individuals vaccinated with the COVID-19 vaccine is high, it can be stated that parents do not find the COVID-19 vaccine reliable for their children. While most of the studies conducted around the world and in Türkiye on the approaches of parents to childhood vaccines show that mothers do not trust even childhood vaccines, this study has shown that COVID-19 vaccines are also within the limits of this insecurity [19,20]. The anxiety of parents for their children varies depending on factors such as parents' educational status of parents, thoughts on vaccination, religious beliefs, and social security. It can be said that distrust of the COVID-19 vaccine stems from possible side effects of the vaccine in the future and this anxiety does not decrease no matter how high the level of education level is [21].

When studies on the attitudes to using nutritional supplements were examined before the COVID-19 pandemic process throughout the country and around the world, it was seen that the use of nutritional supplements, especially vitamins D and C, increased during the pandemic process [22,23,24]. However, there have been almost no studies on whether individuals use food supplements for their children in this process. In the study, it was determined that the percentage of parents who used nutritional support for their children increased (49.64%) compared to the pre-pandemic period (41.43%), and there was a significant difference between them ($p<0.001$). It can be stated that the main reason for this increase is the academic use of nutritional supplements (vitamins D and C) against the COVID-19 pandemic and increased advertisements in the media. In the study, parents who did not use nutritional supplements before the pandemic thought their children were adequately fed with natural foods in this process, while they stated that natural and adequate nutrition was not sufficient to protect their children against infection during the pandemic process. Additionally, it was determined that there was a significant difference between the two periods ($p<0.001$).

The most effective factor in the decision of parents to use nutritional support for their children both before and during the pandemic was the doctor's recommendation (18.21%). The fact that there was no change in the preferences of the parents in the study can be interpreted with the high level of education of the individuals and, accordingly, their tendency to refer to reliable sources. However, it should be noted that 11.07%-13.57% (before processing) of people used nutritional supplements without any advice from anyone.

In studies, it is stated that before the pandemic, individuals often preferred nutritional supplements such as multivitamins, vitamin B12, propolis, probiotics, fish oil, and vitamins D and C [22,23,24]. Studies in children are mostly on iron and vitamin D support during childhood, and it has been determined that there are not many publications on parents' preferences to use nutritional support for their children [25] (Ayseli et al., 2024). In the study, the most preferred support of parents for their children before and during the pandemic was vitamin D (22.86% and 30%), fish oil (25.36% and 26.79%), vitamin C (18.57% and 24.64%) and multivitamin (17.86% and 23.93%), respectively. The increase in the use of nutritional supplements during the pandemic period compared to the pre-pandemic period was found to be significant at the $p < 0.05$ level. These results are in agreement with a previous study carried out by [25].

In studies conducted before the COVID-19 outbreak, patients with normal blood levels of vitamin D had lower mortality rates; Vitamin C supplementation has been stated to increase immune system activity and increase resistance against infections [26-28]. In many studies conducted during the pandemic process, the importance of vitamins D and C in the prevention of COVID-19, which is a respiratory tract infection, was mentioned [29,30]. The strengthening effect of vitamins D and C on the immune system and their role in the prevention of infections explain the increase in the use of vitamins D and C compared to the pre-pandemic period [25]. In the study, it was observed that parents used nutritional supplements for their children to strengthen their immune systems against diseases, and this rate of use increased compared to the

Table 3. COVID-19 pandemic information of individuals.

COVID-19 PANDEMIC INFORMATION	Total (n: 280/ 100)			
	YES		NO	
	n	%	n	%
Have you been diagnosed with COVID-19 during the pandemic process?	120	43	160	57
Has your child been diagnosed with COVID-19 during the pandemic process?	31	11	249	89
Do you have any relatives other than your child who was diagnosed with COVID-19 during the pandemic process?	205	73	75	27
Do you have a relative who died due to the diagnosis of COVID-19 during the pandemic process?	75	27	205	73
Do you think you have enough information about COVID-19 Disease?	237	85	43	15
Would you vaccinate your child with the COVID-19 Vaccine if you had the opportunity?	79	28	201	72

	Mask		Social Distance		Hygiene		All	
	n	%	n	%	n	%	n	%
Which of the following protection methods do you apply during the pandemic process?	6	2	0	0	7	3	267	95

	I have been vaccinated all doses of the vaccine		I have been vaccinated with a few doses of the vaccine		I'm considering vaccination		I don't think getting vaccinated		I don't believe the vaccine is protective	
	n	%	n	%	n	%	n	%	n	%
What is your opinion about the COVID-19 Vaccine?	125	45	99	35	4	1	28	10	24	9

Table 4. Findings on the use of nutritional supplements.

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		Pandemic		Process		Ranks Test	
		n	%	n	%	z	p
Do you use any nutritional supplements for your child?	Yes	116	41.43	139	49.64	14.50	<0.001
	No	163	58.21	131	46.79		
	Blank	1	0.36	10	3.57		
If your answer is 'No', could you please indicate why you do not use nutritional support?	I think my child is getting enough nutrition	80	28.57	71	25.36	3.416	0.001
	I do not use it because it is not recommended	5	1.79	10	3.57		
	I prefer to take natural foods	69	24.64	45	16.07		
	I think it is harmful to health	1	0.36	2	0.71		
	Other (specify) ……	2	0.71	0	0.00		
	Blank	123	43.93	152	54.29		
If your answer is 'Yes', who recommended it?	TV	3	1.07	4	1.43	2.867	0.004
	Book, magazine, newspaper	0	0.00	0	0.00		
	Family, Friends	12	4.29	19	6.79		
	Internet	2	0.71	0	0.00		
	Nobody suggested it, I find it myself	31	11.07	38	13.57		
	Pharmacist	13	4.64	21	7.50		
	Nutritionist	0	0.00	0	0.00		
	Doctor	51	18.21	51	18.21		
	Other (specify) ……	1	0.36	3	1.07		
	Blank	167	59.64	144	51.43		
Which of the following nutritional supplements did you use for your child? (You can mark more than one answer.).	Vitamin A	11	3.93	15	5.36	1.908	0.05
	Probiotic	26	9.29	28	10.00		
	Vitamin C	52	18.57	69	24.64		
	Multivitamin	50	17.86	67	23.93		
	Vitamin D	64	22.86	84	30.00		
	Fish Oil	71	25.36	75	26.79		
	Vitamin E	11	3.93	13	4.64		
	Propolis	40	14.29	39	13.93		
	Vitamin B	13	4.64	15	5.36		
	Zinc	29	10.36	32	11.43		
	Other	3	1.07	14	5.00		
	Blank	155	55.36	128	45.71		

z: WilcoxonsSignedrRanks test value

Table 5. Statistical evaluation of the mental and psychosomatic effects of the COVID-19 pandemic on individuals

Scale for Evaluating the Mental and Psychosomatic Effects of the Covid-19 Pandemic	Strongly Disagree		Disagree		Indecisive		Agree		Strongly Disagree		Kolmogorov-Simirnov One - Sample Test (KS)	
Variable	n	%	n	%	n	%	n	%	n	%	KS	p
I feel helpless in the face of the virus and experience a lot of fear.	63	22.5	136	48.6	40	14.3	34	12.1	7	2.5	0.303	<0,001
I get nervous, thinking that the epidemic will not pass for a long time.	38	13.6	102	36.1	47	16.8	79	28.2	14	5	0.237	<0,001
I get worried thinking that this virus will infect me and my loved ones.	28	10	70	25	37	13.2	111	39.6	34	12.1	0.264	<0,001
I feel pain and pain in my body that I don't know the cause of.	48	17.1	132	47.1	42	15	48	17.1	10	3.6	0.298	<0,001
Thinking that this situation will continue for a long time, I find myself in different thoughts.	64	22.9	123	43.9	41	14.6	43	15.4	9	3.2	0.284	<0,001
The fact that the epidemic causes deaths causes me to experience psychological stress.	33	11.8	88	31.4	47	16.8	89	31.8	23	8.2	0.216	<0,001
I do not feel safe by finding the measures taken insufficient.	47	16.8	131	46.8	49	17.5	43	15.4	10	3.6	0.291	<0,001
I always suspect that the virus is transmitted and I have the thought of going to the hospital.	88	31.4	148	52.9	21	7.5	19	6.8	4	1.4	0.316	<0,001
I constantly follow the news about this situation and think about the outcome of the epidemic.	47	16.8	111	39.6	38	13.6	76	27.1	8	2.9	0.264	<0,001
The epidemic affects me more psychologically than physically.	46	16.4	114	40.7	39	13.9	64	22.9	17	6.1	0.27	<0,001
The rapid spread of the coronavirus terrifies me.	40	14.3	107	38.2	52	18.6	64	22.9	17	6.1	0.248	<0,001
The increase in deaths due to coronavirus causes me to be more nervous and angrier.	47	16.8	121	43.2	41	14.6	60	21.4	11	3.9	0.28	<0,001
I have an intense fear of death in the face of the epidemic.	83	29.6	149	53.2	30	10.7	12	4.3	6	2.1	0.311	<0,001
While thinking about the difficult process I am going through right now, I cannot prevent the contractions that occur in my body involuntarily.	111	39.6	134	47.9	21	7.5	11	3.9	3	1.1	0.274	<0,001
I think the epidemic will bring worse results.	58	20.7	120	42.9	64	22.9	32	11.4	6	2.1	0.26	<0,001
The stress I experienced in the face of the current virus does not go away easily.	66	23.6	144	51.4	40	14.3	28	10	2	0.7	0.306	<0,001
I often experience the feeling of losing my balance when I have to go out.	125	44.6	137	48.9	14	5	4	1.4	0	0	0.282	<0,001
In the face of this situation, I feel tremors in my body and numbness in my hands and feet.	138	49.3	129	46.1	13	4.6	0	0	0	0	0.315	<0,001

pre-pandemic period. 20% of the parents stated that they use nutritional supplements to protect themselves against COVID-19. On the other hand, it has been determined that the most important factor parents consider when purchasing nutritional support before and during the pandemic is the reliability of the brand (25.36% and 28.57%). It is known that in the use of vitamins, consumers place importance on reliability in choosing a brand and then a well-known product [31].

In the study, it was determined that the first address of parents to provide nutritional supplements was the pharmacy, both before the pandemic and during the pandemic period (38.93% and 42.86%), and the rate of application to the pharmacy during the pandemic period increased significantly ($p=0.007$). It has been observed that the trust in the pharmacist has increased and maintained with the pandemic process. Furthermore, even though life has moved home with the pandemic and people prefer the internet environment while shopping, the increase in the use of providing nutritional support has not been much. It can be said that the anxiety and fear of society about going to hospitals during the pandemic process leads them to pharmacies, which are more reliable and closer to the community.

During the COVID-19 pandemic, which has deeply affected the country's economy and social life, many people have been affected psychologically, although not physically. Individuals whose social, educational, and business lives were affected were concerned about the transmission of the disease to themselves and their loved ones during the pandemic. In addition, facing the reality of death from the beginning of the pandemic to its control has increased the instincts of individuals to protect themselves from the disease for themselves and their loved ones. In the study, articles 1-3, 5-7, 9-12, and 15 in the "Scale for Evaluation of the Mental and Psychosomatic Effects of the COVID-19 Pandemic" applied the relationship between the COVID-19 pandemic and mental health. "; articles 4, 8, 13, 14, and 16-18 were evaluated in two sub-dimensions as "Psychosomatic Effects" [32]. When the items measuring the mental impact of the pandemic were evaluated, it was revealed that the parents experienced panic and psychological stress and were affected psychologically due to the possibility of the virus being transmitted to themselves and their children resulting in death. However, it has been determined that these psychological effects do not cause a definite psychosomatic effect in individuals, but they feel pain and pain of unknown origin, although very little. The response distributions given to the items in the study were found to be statistically significant among themselves ($p<0.001$). The majority of parents participating in the study are women and housewives, and it can be said that the psychological and psychosomatic effects that occur during the pandemic process occur due to the increase in responsibilities and workloads at home.

4. CONCLUSION

In the period when the coronavirus (COVID-19) started to affect the world, it triggered the formation of various mental and physical problems in many people. The psychological pressure caused by uncertainty and the course of the epidemic has caused parents to worry about the health of their children. Many adults have turned to strengthening their immune systems to protect themselves and their children against the epidemic. For this purpose, it was thought that they used nutritional supplements, especially for their children. In the study, the pre-pandemic and post-pandemic status of the nutritional support habits of their children was compared; The relationship between the psychological and psychosomatic effects of the pandemic process and the use of nutritional support was evaluated. Although the majority of people who participated in the study were diagnosed with COVID-19, it was determined that the number of people who lost their lives was low. It can be said that the low mortality rates are the result of the importance given to vaccination against coronavirus disease during the period. Parents have been determined to be highly aware of COVID-19 during the pandemic process and follow mask, social distancing, and hygiene rules, attaching importance to the vaccine, but parents do not find the COVID-19 vaccine reliable for their children. Parents have been observed to use nutritional supplements for their children to strengthen the immune system against viral infections, and the use of nutritional support increases with the pandemic process. It has been found to refer to health workers (doctors and pharmacists) in the process of using and providing nutritional support to their children both before and during the pandemic. During the pandemic process, it has been determined that most parents have thought of the possibility of transmitting the virus to their children resulting in death, and that they experience psychological stress due to the situation. Taking into account the increase in the use of nutritional support in the process compared to the pre-pandemic period and the psychological effects of the COVID-19 pandemic, it can be said that the habits of individuals to use nutritional support for their children are affected by psychological stress. The study is a current study on the use of nutritional support in children, and the results will lead to studies on this subject and contribute to the literature.

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5. MATERIALS AND METHODS

5.1. Method

The objective of this study was to ascertain the influence of parental mental and psychosomatic anxiety levels on the variety and quality of nutritional supplements chosen for their primary school-age children before and during the ongoing COVID-19 pandemic. The study aimed to determine the levels of awareness and anxiety related to the COVID-19 among parents. Additionally, it sought to identify differences in the nutritional support preferences of parents before and during the pandemic, to examine the relationship between anxiety levels and the variety of nutritional support preferences, and to ascertain the factors influencing the nutritional support preferences of parents.

The study was conducted between January 2022 and June 2022 on parents with children enrolled in the Sabri Artam Foundation Primary School in the Üsküdar district of Istanbul. The sample size was calculated using the R programme with an 80% power, based on a mean and standard deviation of 16.8 ± 5.85, as reported in the literature [31, 33]. This was deemed an appropriate sample size to detect a difference in nutritional support values between individuals with different levels of parental involvement. The study included individuals with a first- or second-degree relationship (mother, father, sister, brother, etc.) who were volunteers and had children of primary school age. The study was approved by the Biruni University Non-Interventional Ethics Committee (decision number 2022/65-5). Information forms were prepared to determine the demographic information of the individuals and the habits of parents regarding the use of nutritional supplements to their children before and during the Coronavirus Disease 2019 (Covid-19) pandemic. Additionally, the Scale for Assessing the Mental and Psychosomatic Effects of the Coronavirus Disease 2019 Pandemic was employed as a reference for determining the anxiety level of parents [32]. The data collection instrument, comprising the information form and the scale questions, was administered via face-to-face interviews. The responses were recorded in an Excel spreadsheet.

5.2. Statistical analysis

The statistical evaluation of the study was conducted using the R software (version 3.6.2-CRAN). In the case of continuous variables, the mean and standard deviation are presented; for discrete variables, the median and percentage are given. The scale employed was a Likert-type scale, which has been demonstrated to possess both validity and reliability. The Wilcoxon signed-rank test was employed for the comparison of continuous variables between groups, while the Kolmogorov-Smirnov one-sample test was used for discrete and categorical variables. In the statistical evaluation, hypotheses were considered pairwise, and results were deemed significant if the p-value was equal to or less than 0.05.

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