

**Impacto do isolamento social devido à pandemia da COVID-19 na
alimentação, tempo de tela, práticas de atividade física e qualidade de
vida em crianças com sobrepeso e obesidade**

**Impact of social isolation due to the COVID-19 pandemic on diet,
screen time, physical activity practices and quality of life in children
with overweight and obesity**

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ABSTRACT

The aim of this study was to evaluate the impact of social isolation due to the COVID-19 pandemic on behavioral eating habits, screen time, physical activity practices and quality of life in overweight and obese children. The sample consisted of 68 children, between 6 and 13 years old, who were divided into overweight and obese (OOC = 26) and normal weight (NWC = 42). The following were collected: a) Anthropometric data; b) Children's perception of their behavioral habits; c) The guardian's perception of their behavioral habits; d) Quality of life assessment (PedsQL™); e) Impacts of social isolation on obesity and overweight. Children continued to practice physical exercise during the pandemic, but in both groups there was a slight reduction. The NWC group perceived a greater reduction of their physical activities between periods (pre-pandemic and pandemic) compared to the OOC group ($p=0.048$). Regarding diet, the amount of food consumed appeared to be increased in all groups, with the OOC group having the highest consumption ($p=0.037$). Screen time appeared to be increased in all groups. It is perceived that the COVID-19 pandemic had a negative impact on the quality of life of children, especially in aspects involving mental health, social relationships, school performance and physical abilities. It is concluded that the children practiced physical exercise, besides the small reduction, there was an increase in screen time and in the amount of food consumed. Obese children showed a significant reduction in physical activities before and during the pandemic. Children's quality of life was negatively impacted by the COVID-19 pandemic.

Keywords: obesity, overweight, COVID-19, child, social isolation.

RESUMO

O objetivo deste estudo foi avaliar o impacto do isolamento social devido à pandemia da COVID-19 nos hábitos comportamentais de alimentação, tempo de tela, práticas de atividade física e qualidade de vida em crianças com sobrepeso e obesidade. A amostra foi constituída por 68 crianças, entre 6 a 13 anos, que foram divididas em sobrepeso e obesidade (CSPO= 26) e com peso normal (CPN = 42). Foram coletados: a) Dados antropométricos; b) Percepção da criança sobre seus hábitos comportamentais; c) Percepção do responsável sobre os hábitos comportamentais delas; d) Avaliação da qualidade de vida (PedsQL™); e) Impactos do isolamento social na obesidade e sobrepeso. As crianças continuaram praticando exercício físico durante a pandemia, mas nos dois grupos houve discreta redução. O grupo CPN têm a percepção de ter reduzido mais suas atividades físicas entre os períodos (pré-pandemia e pandemia) em comparação ao grupo CSPO ($p=0,048$). A alimentação aparenta um aumento na quantidade de alimento consumidos em todos os grupos, sendo que o grupo CSPO apresenta maior

consumo ($p=0,037$). O tempo de tela aparenta estar aumentado em todos os grupos. Percebe-se que a pandemia da COVID-19 teve um impacto negativo na qualidade de vida das crianças, principalmente nos aspectos que envolvem a saúde mental, relações sociais, rendimento escolar e capacidades físicas. Conclui-se que as crianças praticaram exercício físico mesmo com pequena redução, houve aumento no tempo de tela e na quantidade de alimentos consumidos. As crianças obesas apresentaram redução significativa na realização de atividades físicas antes e durante a pandemia. A qualidade de vida das crianças foi impactada negativamente pela pandemia de COVID-19.

Palavras-chave: obesidade, sobrepeso, COVID-19, criança, isolamento social.

1 INTRODUCTION

Childhood obesity is associated with a predisposition to the development of several chronic diseases and constitutes an important public health problem, having reached pandemic levels involving several countries in the world (CAMARGOS et al., 2019). A systematic review with meta-analysis identified that the prevalence of obesity is 14.1% among children and adolescents in Brazil (AIELLO et al., 2015). The WHO projection is that in 2025 there will be about 75 million overweight and obese children in the world.

Childhood obesity has a multifactorial feature and is defined by a high body mass index (BMI), varying according to the age and gender of the individuals. The development of eating behavior begins in childhood and it is the result of the interaction between genetic and environmental factors (RAMOS, STEIN, 2020). The processes that may come to characterize the child's future feeding habits are breastfeeding, introduction of complementary foods at the correct age, family eating behaviors and socioeconomic conditions (GILLMAN, 2008).

Not only the dietary pattern is strongly influenced by family habits, but also behaviors related to the practice of physical activities, which reinforces the hypothesis that environmental factors are decisive in maintaining or not a healthy weight (DANTAS, SILVA, 2019). Therefore, it is important to emphasize that the genetic factor is strongly associated with obesity, however, several health determinants, especially behavioral ones, have an influence on this disease, and it is possible to modulate such influence through changes in eating habits and physical activity practices (MENDONÇA, 2010).

On March 11, 2020, the WHO declared that COVID-19, caused by the new Coronavirus, was now considered a pandemic due to the exponential increase in cases on all continents. Due to the lack of knowledge of the natural history of the disease and the

lack of pharmacological treatment and proven effective vaccines, the WHO recommended the adoption of social distancing measures, the use of masks and hand hygiene. With the adoption of social distancing, face-to-face school activities were suspended and remote teaching began to be adopted, keeping children and adolescents restricted at home (BRASIL, Sem Data; GATTI, 2020).

The new coronavirus pandemic has changed the reality experienced by families and their children, and has put those in a vulnerable situation at greater risk of developing diseases, due to factors such as difficulty in maintaining jobs, reduced space for all family members, an increase in the value of the food parcel and difficulty accessing the internet, which made even access to education unfeasible. Considering this scenario, childhood obesity and overweight can impact these children, due to a greater propensity for a sedentary lifestyle, unhealthy diet and greater exposure to screens (HOFFMAN, MILLER, 2020).

Financial difficulties related to the COVID-19 pandemic can exacerbate poverty and further force families to ration food and make cheaper and unhealthy food choices to pay for other necessities such as rent and purchase of medicines (ZEMRANI et al., 2021). Therefore, the diet in this period was greatly altered, due to the modified supply and the rise in food prices, which led to a greater consumption of ultra-processed foods and neglecting the consumption of natural foods. This fact, added to the sedentary lifestyle resulting from social distancing (RUNDLE et al., 2020), contributes to the increase of obesity and overweight on children, and also to the occurrence of malnutrition in those families with greater social vulnerability (PROENÇA et al., 2021; TESTER, ROSAS, LEUNG, 2020).

In addition to the decrease in the practice of physical exercises, children have been spending more time in front of screens, not only due to remote teaching, but also as a form of leisure (DESLANDES, COUTINHO, 2020). While it has been beneficial for educational and social communication purposes, it has also encouraged more sedentary habits in children, which may result in an increased prevalence of childhood obesity and overweight, in addition to increasing the risks of anxiety, depression and inattention, which are harmful to health of the child (CUSCHIERI, GRECH, 2020).

The literature points out that the social isolation caused by the COVID-19 pandemic had an impact on children's lifestyles (STORZ, 2020). However, there is a need to identify the impacts of these behavioral changes on the prevalence of childhood overweight and obesity and on the quality of life of children in Brazil. This study aims to

identify the impact of social isolation due to the COVID-19 pandemic on behavioral eating habits, screen time, physical activity practices and quality of life in overweight and obese children.

2 MATERIALS AND METHODS

2.1 STUDY DESIGN AND ETHICAL ASPECTS

This observational, cross-sectional and analytical study was designed following the STROBE guidelines (VANDENBROUCKE et al., 2014). And, in accordance with the protocol established by the Declaration of Helsinki (published in 1975 and revised in 2013), this study was approved by the Research Ethics Committee of the Bauru School of Dentistry, University of São Paulo (FOB/USP), n ° CAAE 44630921.2.0000.5417. Individuals were included in the sample after agreeing to the Term of Assent and after reading and signing the Term of Free and Informed Consent by their legal guardians.

2.2 SAMPLE SELECTION

The sample was recruited consecutively at the Pediatric Dentistry and Orthodontics clinics of the Bauru School of Dentistry, University of São Paulo (FOB-USP), from August 2021 to June 2022, and consisted of children between 6 and 13 years old, who were divided into 2 groups: diagnosed with overweight/obesity (OOC = 26) and normal weight (NWC = 42).

The criteria for inclusion of patients in the sample were: age range and follow-up at the FOB/USP clinic. On the other hand, children who had other comorbidities, such as systemic arterial hypertension and diabetes or important cognitive alterations, were not part of the sample. Anthropometric data, quality of life assessment instrument, socioeconomic conditions questionnaire and interviews with children and their guardians occurred in the first contact with the participant at the FOB/USP clinics. A total of 68 children answered the questionnaires, all of which were included in the sample.

The most widely used anthropometric index for identifying childhood obesity, recommended by the WHO, is the BMI per age (BRASIL, 2011). After collecting weight and height data, the BMI of each child was calculated and the data obtained were placed in the growth curves proposed by the WHO in 2007 (SOCIEDADE BRASILEIRA DE PEDIATRIA, Sem Data).

Data collection was carried out through the application of pre-established questionnaires and applied in a standardized way, in the waiting room of the FOB-USP

clinics. The questionnaires were read calmly and slowly to the children and then to those responsible for them, by the applicators, respecting the established order of the questions.

2.3 FAMILY SOCIOECONOMIC STATUS

Family monthly income was classified into: 1- Up to 1 minimum wage (MW); 2- from 1 to 2 MW; 3- from 3 to 4 MW; 4- from 5 to 6 MW; 6- Above 6 MW. The minimum wage approved by Provisional Measure 1,021/2020 was adopted, with a value of 1100 BRL. Information on the number of family members was also collected. In addition, the level of education of those responsible was collected, being classified as: 1- Illiterate; 2- Incomplete primary education; 3- Complete primary education; 4- Incomplete high school; 5- Complete high school; 6- Incomplete higher education; 7- Complete higher education.

2.4 CHILDREN'S PERCEPTION OF THEIR LIFESTYLE HABITS

An interview was conducted with the children participating in the study about their perception of their own food, physical exercise practices and screen time during the period of social isolation. This evaluation was carried out by the researchers in the first evaluation at the FOB/USP Clinic. Regarding their eating habits, a healthy diet was considered as one that encompasses all food groups, with the presence of carbohydrates, proteins (animal or vegetable source), variety of vegetables and fruits, little consumption of sugars and fats, in addition a meal was defined as structured non-liquid ingestive events, including breakfast, lunch, afternoon snack and dinner (PIETROBELLI et al., 2020) (SOCIEDADE BRASILEIRA DE PEDIATRIA, 2012).

The practice of physical activity was considered as any activity such as running, playing, cycling, swimming, etc (DUNTON, DO, WANG, 2020). The WHO and the Brazilian Society of Pediatrics (SBP) recommend the practice of 60 minutes of moderate to intense physical activity per day (SOCIEDADE BRASILEIRA DE PEDIATRIA, 2017). Moderate to vigorous intensity activities are those that make your breathing quicken and your heart beat faster, such as cycling, swimming, playing on a playground, running, jumping, and other activities that are at least as intense as walking.

Screen time encompasses all the time spent watching television, using computers and cell phones, playing video games, disregarding the time spent due to remote teaching. The SBP recommends a maximum permanence time of 120 minutes daily (SOCIEDADE BRASILEIRA DE PEDIATRIA, 2019).

2.5 PERCEPTION OF THE PERSON IN CHARGE FOR LIFESTYLE HABITS

The guardians of the study participants were interviewed about their perception of food, physical exercise practices and child screen time during the period of social isolation. This evaluation was carried out by the researchers in the first evaluation at the FOB/USP Clinic.

2.6 QUALITY OF LIFE

Quality of life was measured using the validated Pediatric Quality of Life Inventory version 4.0 questionnaire. The PedsQL™ contemplates the dimensions: physical (1), emotional (2), social (3) and school (4); eight categories to evaluate the physical, five for emotional, five for social and five for school. The questionnaire was answered by the child and the guardian. The questions measure how much each item represented a problem in the last month, with a five-option response scale (0-never a problem; 1-almost never a problem; 2-sometimes it is a problem; 3-often it is problem; 4- almost always a problem). Negative questions are scored inversely on a scale of 0-100 (0=100; 1=75; 2=50; 3=25; 4=0), the higher the score, the better the quality of life (SOUZA et al., 2014).

2.7 STATISTICAL ANALYSIS

Statistical analysis was performed using the JAMOVI software. The best statistical tests for comparison between 2 groups were used, when necessary. For nominal qualitative variables comparing 2 groups (unpaired: chi-square/Fischer's exact test; matched: McNemar); For ordinal or quantitative qualitative variables without normal distribution comparing 2 groups (unpaired: Mann-Whitney; Paired: Wilcoxon). Finally, for quantitative variables with normal distribution comparing 2 groups (unpaired: T test; Paired: paired T test).

3 RESULTS

Data were collected from 68 children, all of whom met the inclusion criteria for patients in the sample. After classification on the BMI curve, prepared by the WHO, the children were regrouped into 2 groups: 42 with normal weight and 26 with overweight/obesity. The sample collected was between 6 and 13 years of age. The overall age was 9.6 (SD 1.68), while the average age of the NWC group was 9.69 (SD 1.47) and the OOC group was 9.46 (SD 1.98).

As for the school, the children were enrolled from the 1st to the 8th grade, and most were in the face-to-face modality (85.3%) and in just one period of the day (85.3%). The socioeconomic level of 36.77% of the sample was 1 to 2 MW, 19.12% received up to 1 MW, 25% received 3 to 4 MW, and 10.29% received 5 to 6 MW. The average number of members per family was 4.17 and the education level of most of those responsible was high school. The panorama of socioeconomic data and their comparisons between groups can be analyzed in table 1.

Table 1: Comparisons of socioeconomic data between groups. Bauru, 2023.

	NWC	OOC	P
Age	9,69 (1,47)	9,46 (1,98)	0,588†
Parents's education	3,43 (2,09)	3,88 (2,01)	0,404*
Mothers' education	4,38 (1,64)	4,65 (1,62)	0,407*
Income	2,10 (1,12)	2,27 (1,15)	0,560*

Mean (standard deviation): †T test; * Mann-Whitney.

Source: Authors.

Regarding the questionnaire applied to the children about their life habits, some of the results obtained are shown in table 2.

Table 2- Children's answers about their life habits. Bauru, 2023.

	NWC	OOC
Were you active before the pandemic?	Yes 66,67%/ No 33,33%	Yes 61,53%/ No 38,47%
Did you remain active during the pandemic?	Yes 64,28%/ No 35,72%	Yes 50%/ No 50%
Did you consider yourself sedentary before the pandemic?	Yes 33,33%/ No 66,67%	Yes 50%/ No 46,15%/ Didn't know 3,85%
Do you consider yourself sedentary in the pandemic?	Yes 54,76%/No 42,86%/ Didn't know 2,38%	Yes 50%/ No 50%
Regarding the quality of food?	Got worse 16,67%/ Did not change 35,71%/ Improved 47,62%	Got worse 23,08%/ Did not change 34,61%/ Improved 42,31%
Regarding the amount of food consumed?	Decreased 11,90%/ Did not change 40,78%/ Increased 47,62%	Decreased 3,85%/ Did not change 23,08%/ Increased 73,07%
Comparison of time on mobile	Does not use/does not have 4,76%/ Decreased 14,29%/ Did not change 16,67%/ Increased 64,28%	Does not use/does not have 3,85%/ Decreased 7,69%/ Did not change 38,46%/ Increased 50%
Computer time comparison	Does not use/does not have 42,86%/ Decreased 14,27%/ Did not change 23,82%/ Increased 19,05%	Does not use/does not have 53,85%/ Decreased 7,69%/ Did not change 15,38%/ Increased 23,08%
Comparison of TV/video game time	Does not use/does not have 2,38%/ Decreased 7,14%/ Did not change 35,72%/ Increased 54,76%	Decreased 3,85%/ Did not change 26,92%/ Increased 69,23%

Source: Authors.

Regarding the question: “Did you practice any sport or exercise before the pandemic? Which? How many times a week?”, it is possible to have an overview of the answers in table 3.

Table 3- Answers to the question: “Did you practice any sport or exercise before the pandemic? Which? How many times a week?” Bauru-SP, 2022.

	Yes	No	Total
NWC	28	14	42
OOC	16	10	26
Total	44	24	68

Source: Authors.

Regarding the question: “Have you been doing any sports or physical exercise during social distancing? Which? How many times a week?” It is possible to have an overview of the responses in Table 4.

Table 4- Answers to the question: “Have you been doing any sports or physical exercise during social distancing? Which? How many times a week?” Bauru-SP, 2022.

	Yes	No	Total
NWC	27	15	42
OOC	13	13	26
Total	40	28	68

Source: Authors.

Tables 5 and 6 present the results for the question: “Did you consider yourself a sedentary child before the pandemic, compared to your peers of the same age?” and “Would you consider that you are a sedentary child in this pandemic period?”, respectively.

Table 5- Answers to the question: “Did you consider yourself a sedentary child before the pandemic, compared to your peers of the same age?” Bauru-SP.

	Yes	No	Total
NWC	28	14	42
OOC	12	13	25
Total	40	27	67

Source: Authors.

Table 6- Answers to the question: “Would you consider yourself a sedentary child in this pandemic period?” Bauru-SP, 2022.

	Yes	No	Total
NWC	18	23	41
OOC	13	13	26
Total	31	36	67

Source: Authors.

There were no statistically significant differences between the groups for the questions: “Compared to others my age, I think my physical activity during leisure time is” ($p=0.450$) and “Compared to others my age, I think my physical activity during leisure time during the pandemic is:” ($p=0.642$). Analyzing within the same group, it was possible to find a statistically significant difference between the sample’s perception over the comparison with colleagues’ physical activities performed before and those performed during the pandemic in the NWC group ($p=0.048$), but not for the OOC group ($p= 0.847$), showing that NWC presented the perception of having reduced their physical activities between periods compared to the OOC group. Tables 7 and 8 present the descriptive analyzes of comparison between colleagues in relation to their practice of physical activities before and during the pandemic, for the NWC and OOC groups, respectively.

Table 7- Descriptive analysis of the comparison of physical exercise before and during the pandemic (NWC group). Bauru-SP, 2022.

	Comparison with peers before	Comparison with peers now
N	42	42
Mean	3,24	2,90
Median	3,00	3,00
Standard deviation	0,983	0,958
25% percentile	3,00	2,00
50% percentile	3,00	3,00
75% percentile	3,00	4,00

Source: Authors.

Table 8- Descriptive analysis of the comparison of physical exercise before and during the pandemic (OOC group). Bauru-SP, 2022.

	Comparison with peers before	Comparison with peers now
N	26	26
Mean	3,00	2,96
Median	3,00	3,00
Standard deviation	0,894	1,04
25% percentile	2,25	2,25
50% percentile	3,00	3,00
75% percentile	3,75	3,00

Source: Authors.

There were no statistically significant differences between the groups for the questions: “Compared to your diet before the pandemic period, do you believe it is:” ($p=0.566$); “Did you eat school lunches or take food from home?” ($p=0.874$); “Compared to the time you spent on your cell phone/tablet before the pandemic, do you believe you are:” ($p=0.484$); “Compared to the time you spent on the computer before the pandemic, do you believe you are:” ($p=0.652$); “Compared to the time you spent watching television/video games before the pandemic, do you believe you are:” ($p=0.212$). But there

was a statistically significant difference for the question: “Compared to your diet before the pandemic period, do you believe that the amount of food you consume daily is:” ($p=0.037$) with an average for NWC of 2.36 (SD 0.692) and OCC of 2.69 (SD 0.549), demonstrating that the OCC group eats more food.

Regarding the questionnaire applied to parents about the children's lifestyle, the results obtained are shown in table 9.

Table 9- Responses of guardians about their lifestyle. Bauru, 2023.

	NWC	OCC
Was the child active before the pandemic?	Yes 97,62%/ No 2,38%	Yes 92,31%/ No 7,69%
Compared to before the pandemic, how active is the child?	Less active 40,48%/ Did not change 50%/ More active 9,52%	Less active 34,61%/ Did not change 53,85%/ More active 11,54%
Food quality compared to before the pandemic	Got worse 9,52%/ Did not change 57,14%/ Improved 33,34%	Got worse 30,77%/ Did not change 38,46%/ Improved 30,77%
Quantity of food compared to before the pandemic	Decreased 7,14%/ Did not change 47,62%/ Increased 45,24%	Decreased 11,54%/ Did not change 26,92%/ Increased 61,54%
Time spent on mobile compared to before the pandemic	Does not use/does not have 9,52%/ Decreased 2,38%/ Did not change 28,58%/ Increased 59,52%	Does not use/does not have 7,70%/ Decreased 15,38%/ Did not change 26,92%/ Increased 50%
Time spent on the computer compared to before the pandemic	Does not use/does not have 35,72%/ Decreased 11,90%/ Did not change 26,19%/ Increased 26,19%	Does not use/does not have 34,62%/ Decreased 19,23%/ Did not change 30,77%/ Increased 15,38%
Time spent watching television/video games compared to pre-pandemic	Does not use/does not have 4,76%/ Decreased 11,90%/ Did not change 35,72%/ Increased 47,62%	Does not use/does not have 3,84%/ Decreased 15,38%/ Did not change 23,08%/ Increased 57,70%
Life habits compared to before the pandemic	Got worse 42,86%/ Did not change 35,71%/ Improved 19,05%/ Didn't know 2,68%	Got worse 61,54%/ Did not change 26,92%/ Improved 11,54%

Source: Authors.

There was no statistically significant difference between the groups regarding the questions: “Do you believe that your child is more or less active during this period of isolation?” ($p=0.543$); “Compared to feeding before the pandemic period, do you believe that your child is eating:” ($p=0.151$); “Compared to food before the pandemic period, do you believe that the amount of food your child consumes in the day is:” ($p=0.329$); “Compared to the time your child spent on the cell phone/tablet before the pandemic, do you believe you are:” ($p=0.610$); “Compared to the time your child spent on the computer before the pandemic, do you believe you are:” ($p=0.564$); “Compared to the time your child spent watching television/video games before the pandemic, do you believe you are:” ($p=0.331$); “Do you feel that the pandemic has worsened or improved your child’s lifestyle?” ($p= 0.241$).

In the question: “In relation to before the pandemic, do you believe that your child was an active child?” It is possible to obtain an overview of these responses in Table 10.

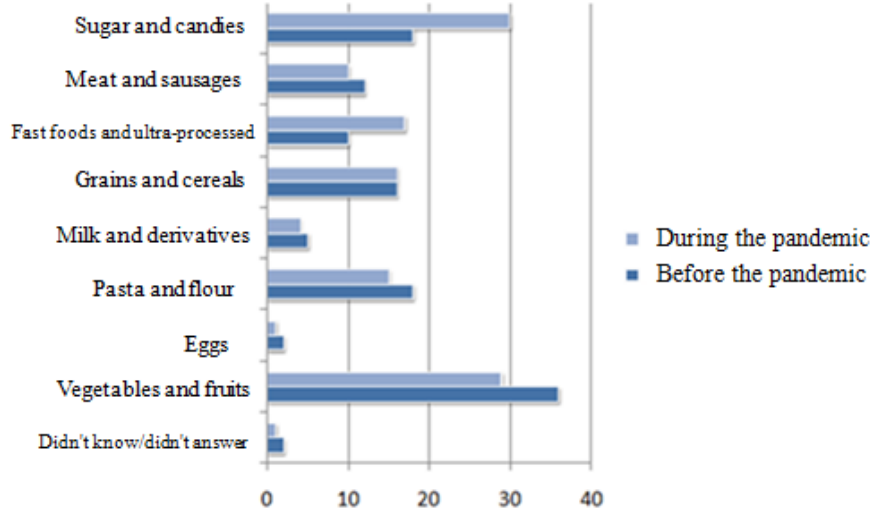
Table 10- Answers to the question: “In relation to before the pandemic, do you believe that your child was an active child?” Bauru-SP, 2022.

	Yes	No	Total
NWC	41	1	42
OOC	22	2	24
Total	63	3	66

Source: Authors.

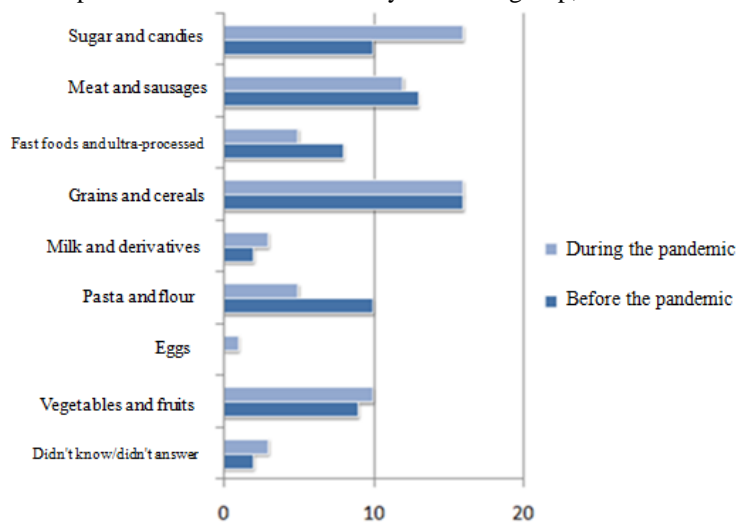
Graphs 1 and 2 show the number of answers of the foods most consumed by children in the NWC and OOC groups, respectively, in the period before and during the COVID-19 pandemic.

Graph 1- Foods most consumed by the NWC group, Bauru-2023.



Source: Authors.

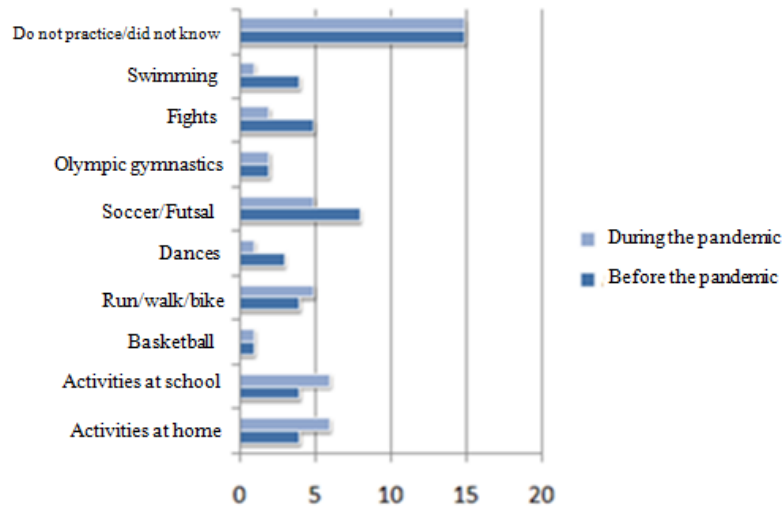
Graph 2- Food most consumed by the OOC group, Bauru-2023



Source: Authors.

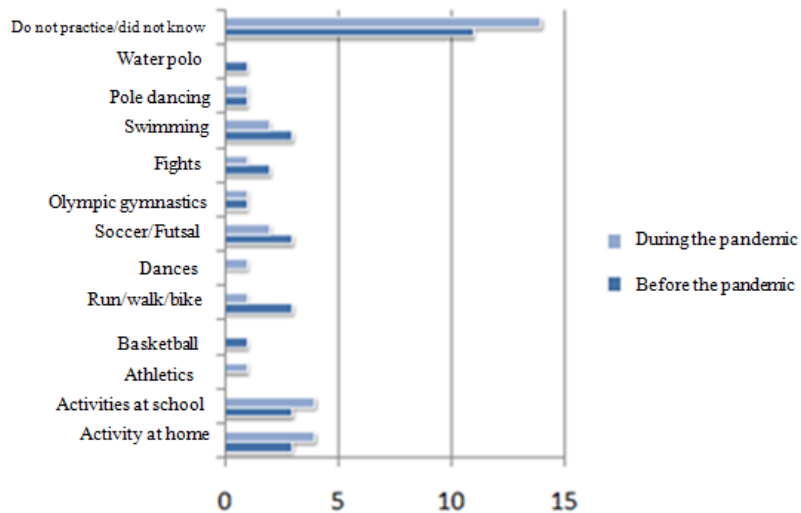
Graphs 3 and 4 show the number of answers of the types of physical activity practiced by children in the NWC and OOC groups, respectively, in the period before and during the COVID-19 pandemic.

Graph 3- Physical activities practiced by children from the NWC group, Bauru-2023.



Source: Authors.

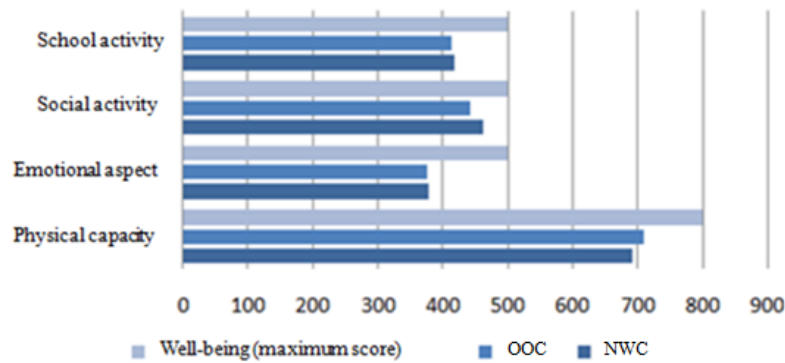
Graph 4- Physical activities practiced by children from the OOC group, Bauru-2023.



Source: Authors.

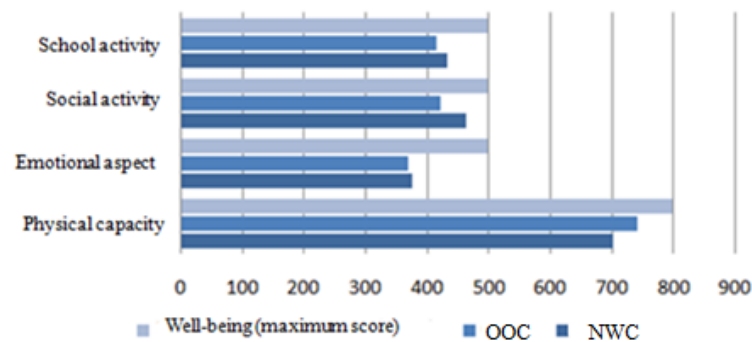
The results obtained by the PedQL questionnaires are shown in graphs 5 and 6, responses obtained by the children and their guardians, respectively.

Graph 5- Results obtained in the PedQL questionnaire from the responses of children in the NWC and OOC groups. Bauru, 2023.



Source: Authors.

Graph 6- Results obtained in the PedQL questionnaire from the answers of the parents of the NWC and OOC groups. Bauru, 2023.



Source: Authors.

4 DISCUSSION

The results showed that many children in both groups remained active during the pandemic, even with the closure of many services during this period. However, there was a significant reduction in the group of obese children. Most continued practicing the same exercises, mainly dancing, soccer, swimming, running and fights. Comparisons within the same group in the pre-pandemic and pandemic made possible the establishment of a statistically significant difference between the perception of the comparison between colleagues' physical activities performed before with those performed in the pandemic in the NWC group. This group showed a better perception of the reduction in their physical activities between periods (pre-pandemic and pandemic). The children's explanation for these findings was based on the attitude of their parents, who did not allow them to leave the house to play due to the pandemic and thus spent more time on their cell phones.

When analyzing screen time, the perception of children and their guardians indicated an increase in time spent on cell phones and television during the pandemic, with no statistically significant difference between the two groups. Most parents and

children attribute this occurrence to the longer time spent at home, due to travel restrictions to avoid the spread of COVID-19. It has already been shown in another study that there is a decrease in the practice of physical exercises, so children have been spending more time in front of screens, despite remote teaching, as a form of leisure (DESLANDES, COUTINHO, 2020).

In the aspect of food, it is interesting to note the perception of children and their guardians, which point to an increase in food consumption during the period in both groups, and when comparing the groups, a significant difference is perceived ($p=0.037$) with an average of 2.36 (SD 0.692) for NWC and 2.69 (SD 0.549) for OOC, i.e., the OOC group eats a larger amount of food. This fact led obese children to have a greater exposure factor to increased obesity or overweight.

Regarding children's food choices, comparing the two periods mentioned above, an increase in the consumption of industrialized foods, foods with high sugar levels and fast foods can be noticed, however, consumption of vegetables and grains was maintained during the period. A Brazilian study demonstrated the consumption of less healthy foods during this period, due to the difficulty in providing and replacing fresh and healthy foods, as well as the ease of purchasing and storing ultra-processed products (MALTA et al., 2021).

The pandemic brought many necessary adaptations to the population's lifestyle due to the risk of contagion, modifying the quality of life (QOL). According to Soares et al (2011), QOL is understood as a multidimensional condition that includes: (1) physical, which covers the individual's perception of their physical condition, (2) psychological, which covers the emotional and mental condition, and (3) social, which is the individual's perception of social roles and relationships. In addition, quality of life relates good dimensions, such as mobility, and bad ones, such as pain (SOARES et al., 2011).

After analyzing the results obtained by the PedQLTM questionnaire (KLATCHOIAN et al., 2008), it is noticeable that the physical, emotional, social and school dimensions are reduced in all groups, both in the questionnaire answered by the children and in the one answered by those responsible, which indicates the presence of a negative impact on quality of life. An interesting hypothesis for this negative impact would be that of social isolation and the use of screens, which encourages more sedentary habits in children, which can lead to an increase in the prevalence of childhood obesity or overweight, in addition to increasing the risks of other comorbidities, anxiety,

depression and inattention, impacting negatively the child's health (CUSCHIERI, GRECH, 2020).

In school matters, many children reported difficulty in keeping up with tasks at home and a drop in concentration during the pandemic, since teaching was carried out at a distance, through screens and assisted by those responsible. With regard to the social dimension, which addressed issues of difficulty living together, Bullying and social limitations, it was the one with the highest average score in all groups in both questionnaires, that is, with the lowest impact on quality of life. It is therefore shown that the social isolation caused by the COVID-19 pandemic has had an impact on the children's lifestyle, as already discussed in the literature (STORZ, 2020).

Emotional issues, which address anxiety, fear, sleep, sadness, had the lowest average scores in all groups in both questionnaires, which may correlate with an impact on mental health generated by social isolation. According to Oliveira et al (2020), there was an increase in the risk of developing symptoms of anxiety, depression and other psychological problems, related to increasing stress, as a result of mobility restrictions, school closures, decreased physical social relationships, in addition to grief related to deaths due to COVID-19 (OLIVEIRA et al., 2020). These findings highlight the need to monitor the mental health of children and adolescents in the post-pandemic period.

This study points out some limitations, the sample size was reduced especially among obese children. Studies with a larger number of children could better represent the reality present in these children's lives. However, it was possible to assess the discreet impact of social isolation due to the COVID-19 pandemic on behavioral eating habits, screen time and physical activity practices in overweight and obese children. The side effects left by the pandemic need to be investigated, so that the quality of life of the population can be improved.

5 CONCLUSION

Given this, it is possible to conclude that in the aspect of physical exercise, children continued to practice, but there was a slight reduction during the pandemic. Children of normal weight showed a perception of the reduction in their physical activities between periods (pre-pandemic and pandemic) compared to obese children. There was an increase in the amount of food consumed by children, more markedly in obese children. About screen time, especially time spent on cell phones and television, there was an increase in both groups. It can be seen that the pandemic appears to have an

important impact on the quality of life of children, especially in aspects involving mental health, as well as an impact on social relationships, school performance and physical abilities of children.

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