

# EVALUATION OF FOOD PRACTICES OF SCHOOLS FROM THE RECÔNCAVO BAIANO DURING THE COVID-19 PANDEMIC

## AVALIAÇÃO DE PRÁTICAS ALIMENTARES DE ESCOLARES DO RECÔNCAVO BAIANO DURANTE A PANDEMIA DE COVID -19

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**Abstract: Introduction:** Brazil adopted health measures to contain the spread of the SARS-CoV-2 virus and slow down the growth of COVID-19 cases, such as the interruption of school activities and prolonged stay at home. These measures abruptly changed the routine of children and adolescents, generating several effects. **Objective:** To describe the changes in food consumption, physical activity and health status of children and adolescents during the period of social isolation imposed by the COVID-19 pandemic. **Methodology:** Cross-sectional descriptive study carried out with students from a private school in the Reconcavo of Bahia. Data were collected through an online questionnaire on “Google Forms” with parents and/or guardians of students. Socioeconomic, lifestyle, clinical, nutritional and dietary variables were surveyed. Measures of central tendency (mean) and dispersion (standard deviation) were calculated for continuous

variables and frequencies for discrete variables. **Results:** The sample consisted of 32 students. Family incomes of up to 1 minimum wage (28.12%) and 1 to 3 minimum wages (46.87%) were predominant. The practice of physical activity prior to the pandemic was present in 81.25% of the sample, while during social isolation sedentary lifestyle was 46.87% and increased exposure to screens was present in 90.62% of the evaluated individuals. The absence of comorbidities was verified in 40.62% of the sample. On the other hand, obesity (according to the perception of parents and/or guardians) was found in 18.75% of the sample, as well as high cholesterol in 9.37% and other comorbidities in 6.25% of individuals. Body modification was reported by 56.25% and change in food consumption by 75.00% of respondents. Changes in the type of food consumed occurred in 81.25% of the sample, highlighting the increase in the consumption of snacks (68.75%). **Conclusion:** Some changes were identified in the pattern of physical activity, health and food consumption in the evaluated sample, indicating the effect of the pandemic on the diet and quality of life and health of children and adolescents.

**Keywords:** COVID-19; Food Consumption; Children; Adolescent; Pandemic.

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## INTRODUCTION

Brazil and the world have experienced the pandemic caused by the SARS-CoV-2 virus establishing sanitary measures to control contagion to contain the spread of the virus and slow down the exponential growth of COVID-19 cases. Among the main measures to combat COVID-19 stand out the interruption of school activities, the need for social distancing with consequent prolonged stay at home. These measures abruptly changed the routine of thousands of children and adolescents due to the need for absence or restriction of social interaction <sup>(1,2)</sup>.

In addition, it is known that the absence or restriction of social life, the separation or loss of some component of the family, lack of certainty about the issues involving the disease, contributed to negative feelings related to the pandemic that can directly affect the feeding of parents, potentiating the chances of changes in the eating patterns of children and adolescents <sup>(3)</sup>. It is also noteworthy that, in 143 countries, almost 370 million school-age individuals usually depend on school meals to obtain a reliable source of daily nutrition, and that in response to the pandemic they needed to look for other ways to eat while schools were closed <sup>(4)</sup>.

When considering the emotional reactions and behavioral changes exposed by children and adolescents during the period of social isolation, difficulties of concentration, irritability, fear,

restlessness, boredom, feeling of loneliness, changes in sleep pattern and diet are reported <sup>(5)</sup>. Thus, it is believed that the evolution of stress in this period, in addition to other factors, may be associated with dietary changes <sup>(6)</sup> and the reduction in the quality of the diet <sup>(7)</sup>, resulting in several health-related problems <sup>(8)</sup>. In addition, it is mentioned a decrease in physical activity levels due to accommodation in sedentary tasks for longer (online games, watching television and remote classes) <sup>(9,10)</sup>.

Thus, the objective of this study was to describe the changes in food consumption, in the practice of physical activity and in the state of health of children and adolescents in the period of social isolation imposed by the COVID-19 pandemic in a private school in Recôncavo da Bahia.

## METHODOLOGY

This is a cross-sectional study, of a descriptive nature, applied to the children and youth public to evaluate the changes in food consumption, in the practice of physical activity and in the state of health in the period of social isolation imposed by the COVID-19 pandemic among children and adolescents of the Adventist College of Bahia (CAB), a private educational institution that serves from elementary school to high school. All research procedures and the Free and Informed Consent Form (TCLE) and were approved (opinion number 5.075.559) by the Research Ethics Committee of the Adventist College of Bahia (FADBA).

The sampling was defined by convenience in a non-probabilistic and non-random way considering the interest of participation of those investigated. Thus, all parents and/or guardians of individuals of school age of the CAB (children and adolescents) who were interested in joining the research were investigated.

The inclusion criteria were: parents and/or guardians with access to electronic equipment (smartphone, computer, notebook, tablet and others) with access to the internet and understanding of digital methodologies. On the other hand, the exclusion criteria adopted were: parents and/or guardians of schoolchildren over 18 years of age.

The instrument used for data collection was the online questionnaire prepared by the authors on the "Google Forms" platform containing information about: a) socioeconomic data (age, gender, education, number of people in the house, family income), b) lifestyle (physical activity and/or recreations), c) clinical (health situation of the participant and presence of comorbidities and obesity), d) anthropometric/nutritional and e) dietary (increase or decrease in food frequency, as well as in the amount of food ingested and fluid intake, changes in the consumption of snacks, main meals, consumption of meat, vegetables, fruits, dairy products). It should be noted that obesity was verified

through the perception of parents and/or guardians about the children's body, that is, without the need for clinical diagnosis.

The average time spent to answer the entire questionnaire was 12 minutes. The link with the virtual questionnaire was made available to the school board, which forwarded it to the parents and/or guardians of a messaging application, not exposing data, such as name, e-mail address and phone number of the participants. Along with the link to the questionnaire, short videos were sent explaining the objectives of the research, the benefits and risks, the methodology used and an instrument for collecting information to invite parents and/or guardians to participate in the research.

For the statistical analysis, the IBM SPSS Statistics Subscription software was used. Measures of central tendency (mean) and dispersion (standard deviation) are calculated for the continuous variables and the frequencies for the discrete variables are checked.

## RESULTS

The sample consisted of 32 students (age:  $9.09 \pm 3.43$  years; 50.00% male). The average number of residents per household was  $0.91 \pm 0.39$  individuals. Family income of up to 1 minimum wage (28.12%) and 1 to 3 minimum wages (46.87%) were predominant.

The practice of physical activity prior to the pandemic was present in 81.25% of the sample, while during the pandemic sedentary lifestyle was reported by 46.87% of respondents and increased exposure to screens was present in 90.62% of the sample. Obesity, according to the perception of parents and/or guardians, was verified in 18.75% of the sample. The absence of comorbidities was identified in 40.62% of those investigated. High cholesterol (9.37%) and other comorbidities were verified in 9.37% and 6.25% of individuals, respectively, with 50.00% of these diagnoses made after the pandemic. However, 46.62% of respondents did not fill in the data regarding the information on the presence of comorbidities and obesity.

The body modification of children and adolescents was reported by 56.25% of the respondents, with the increase in weight reported by 77.78%, the appearance of stretch marks by 5.56%, the increase in height by 11.11% and the development of other manifestations by 5.56% of these cases.

The change in food consumption corresponded to 75.00% of the sample, and increased consumption occurred in 91.67% of cases. The modification of the type of food consumed was reported by 81.25% of respondents, highlighting the increase in snack consumption (68.75%) and the changes in the type of snack consumed (before the pandemic the consumption of snacks with high fat and sugar content was 12.50% and during the pandemic 18.75%), in addition, 50.00% of the sample reported the highest consumption of fruits before the pandemic. Table 1 shows the food consumption

profile of the sample.

**Table 1 - Food consumption profile before and after the pandemic, Cachoeira-BA, 2022.**

Variable	N	%
<b>BEFORE the pandemic, what was the child's main meal like?</b>		
Parents or guardians prepare meals at home	30	93,80
Eat in a restaurant	0	0,00
Order hot meals via delivery	0	0,00
Replace main meals with snacks	0	0,00
Did not answer	2	6,20
<b>DURING the pandemic, what was the child's main diet</b>		
Parents or guardians prepare meals at home	30	93,80
Eat in a restaurant	1	3,10
Order hot meals via delivery	1	3,10
Replace main meals with snacks	0	0,00
<b>What the child's snacks were like, BEFORE the pandemic</b>		
Fried snacks	6	18,80
Snacks high in fat and sugar	6	18,80
Natural foods	17	53,10
Ready-to-eat, packaged snacks and desserts	0	0,00
Did not answer	3	9,30
<b>What the child's snacks were like, DURING the pandemic</b>		
Fried snacks	6	18,80
Snacks high in fat and sugar	6	18,80
Natural foods	17	53,10
Ready-to-eat, packaged snacks and desserts	0	0,00
Did not answer	3	9,30
<b>During the pandemic, did the child increase the amount of snacks?</b>		
No	9	28,10
Yes	22	68,80
Did not answer	1	3,10
<b>Before the pandemic, did my son eat more fruit?</b>		
No	13	40,70
Yes	16	50,00
Did not answer	3	9,30
<b>How many meals does the child normally eat a day?</b>		
3 meals	7	21,90
4 meals	5	15,60
5 meals	11	34,40
6 meals	7	21,90
7 meals	1	3,10
Did not answer	1	3,10
<b>My son started to have a bigger appetite during the pandemic</b>		
No	8	25,00
Yes	24	75,00
<b>The child finishes meals very quickly</b>		
No	18	56,20
Yes	14	43,80
<b>The child likes to try new foods</b>		
No	15	46,90
Yes	17	53,10

Source: Prepared by the authors, 2022.

Table 2 presents the frequency of consumption of the sample before and during the pandemic.

**Table 2** – Frequency of food consumption before and after the pandemic, Cachoeira-BA, 2022.

Food	Before		Durin g	
	N	%	N	%
<b>Fresh fruits</b>				
0 day	1	3,10	1	3,10
1 day	2	6,20	1	3,10
2 days	0	0,00	1	3,10
3 days	2	6,20	4	12,50
4 days	5	15,60	3	9,40
5 days	5	15,60	5	15,60
6 days	2	6,20	2	6,20
7 days	15	47,10	12	37,60
Did not answer	0	0,00	3	9,40
<b>Vegetable or raw vegetable</b>				
0 day	3	9,40	2	6,20
1 day	2	6,20	1	3,20
2 days	2	6,20	3	9,40
3 days	7	21,90	5	15,60
4 days	2	6,20	3	9,40
5 days	4	12,50	4	12,50
6 dias	1	3,20	3	9,40
7 days	11	34,40	8	25,00
Did not answer	0	0,00	3	9,30
<b>Bean<sup>1</sup></b>				
0 day	1	3,10	1	3,10
1 day	2	6,30	1	3,10
2 days	2	6,30	3	9,40
3 days	5	15,60	5	15,60
4 days	1	3,20	0	0,00
5 days	3	9,30	3	9,40
6 days	1	3,10	2	6,30
7 days	17	53,10	14	43,70
Did not answer	0	0,00	3	9,40
<b>Other legumes</b>				
0 day	14	43,70	10	31,30
1 day	7	21,90	5	15,60
2 days	5	15,60	5	15,60
3 days	1	3,10	2	6,20
4 days	0	0,00	0	0,00
5 days	1	3,10	0	0,00
6 days	0	0,00	1	3,10
7 days	4	12,6	6	18,80
Did not answer	0	0,00	3	9,40
<b>Whole foods<sup>2</sup></b>				
0 day	4	12,50	3	9,40
1 day	1	3,10	3	9,40
2 days	2	6,20	3	9,40

3 days	8	25,0	2	6,20
4 days	2	6,20	2	6,20
5 days	3	9,40	3	9,40
6 days	1	3,10	3	9,40
7 days	11	34,50	10	31,20
Did not answer	0	0,00	3	9,40
<b>Breads, rice, crackers, noodles</b>				
0 day	2	6,20	2	6,20
1 day	0	0,00	2	6,20
2 days	2	6,20	1	3,10
3 days	5	15,70	3	9,40
4 days	2	6,20	2	6,20
5 days	6	18,80	3	9,40
6 days	0	0,00	1	3,10
7 days	15	46,90	15	47,00
Did not answer	0	0,00	3	9,40
<b>Meats</b>				
0 day	7	21,90	5	15,60
1 day	2	6,20	3	9,40
2 days	1	3,10	1	3,10
3 days	0	0,00	2	6,20
4 days	5	15,60	0	0,00
5 days	4	12,50	3	9,40
6 days	2	6,20	2	6,20
7 days	11	34,50	12	37,60
Did not answer	0	0,00	4	12,50
<b>Natural Juices</b>				
0 day	1	3,10	1	3,10
1 day	2	6,20	2	6,20
2 days	3	9,40	3	9,40
3 days	1	3,10	2	6,20
4 days	4	12,60	4	12,6
5 days	5	15,60	2	6,20
6 days	2	6,20	2	6,20
7 days	14	43,80	13	40,7
Did not answer	0	0,00	3	9,40
<b>Milk and derivatives</b>				
0 day	4	12,50	4	12,50
1 day	3	9,40	1	6,20
2 days	1	3,10	4	12,50
3 days	4	12,50	2	6,20
4 days	4	12,50	4	12,50
5 days	5	15,70	6	18,90
6 days	2	6,20	2	6,20
7 days	9	28,10	4	12,50
Did not answer	0	0,00	4	12,50
<b>Artificial Juice<sup>3</sup></b>				
0 day	23	71,90	21	65,60
1 day	1	3,10	2	6,30
2 days	1	3,10	2	6,30
3 days	1	3,10	1	3,10
4 days	4	12,50	1	3,10
5 days	2	6,30	1	3,10
6 days	0	0,00	0	0,00
7 days	0	0,00	1	3,10

Did not answer	0	0,00	3	9,40
<b>Soft Drinks</b>				
0 day	22	68,80	20	62,50
1 day	7	21,90	6	18,80
2 days	0	0,00	1	3,10
3 days	2	6,20	1	3,10
4 days	1	3,10	1	3,10
5 days	0	0,00	0	0,00
6 days	0	0,00	0	0,00
7 days	0	0,00	0	0,00
Did not answer	0	0,00	3	9,40
<b>Sweets/Desserts<sup>4</sup></b>				
0 day	3	9,40	2	6,30
1 day	10	31,20	8	25,00
2 days	6	18,80	5	15,60
3 days	3	9,40	5	15,60
4 days	4	12,50	2	6,30
5 days	2	6,20	5	15,6
6 days	1	3,10	1	3,10
7 days	3	9,40	1	3,10
Did not answer	0	0,00	3	9,40
<b>Sausages<sup>5</sup></b>				
0 day	15	46,90	16	50,00
1 day	6	18,80	3	9,40
2 days	4	12,50	2	9,40
3 days	3	9,40	2	3,10
4 days	0	0,00	1	3,10
5 days	2	6,20	2	6,20
6 days	1	3,10	0	0,00
7 days	1	3,10	2	6,20
Did not answer	0	0,00	4	12,60
<b>Fried food<sup>6</sup></b>				
0 day	12	37,50	14	43,80
1 day	9	28,20	4	12,50
2 days	3	9,40	5	15,60
3 days	5	15,60	4	12,50
4 days	1	3,10	0	0,00
5 days	2	6,20	2	6,20
6 days	0	0,00	0	0,00
7 days	0	0,00	0	0,00
Did not answer	0	0,00	3	9,40
<b>“Packaged” snacks</b>				
0 day	13	40,60	13	40,60
1 day	9	28,00	8	25,00
2 days	3	9,40	1	3,10
3 days	4	12,60	3	9,40
4 days	3	9,40	3	9,40
5 days	0	0,00	1	3,10
6 days	0	0,00	0	0,00
7 days	0	0,00	0	0,00
Did not answer	0	0,00	3	9,40
<b>Ultra-processed ready-to-eat and/or fast food<sup>7</sup></b>				
0 day	22	68,80	22	68,80
1 day	9	28,10	4	12,50
2 days	1	3,10	2	6,20



3 days	0	0,00	1	3,10
4 days	0	0,00	0	0,00
5 days	0	0,00	0	0,00
6 days	0	0,00	0	0,00
7 days	0	0,00	0	0,00
Did not answer	0	0,00	3	9,40

**Source:** Prepared by the authors, 2022.

## DISCUSSION

Successive changes in the dietary patterns and lifestyle of the world's population have been happening over the years, such changes are the result of processes such as urbanization, industrialization <sup>(11)</sup> and, recently, have also been intermediated by the COVID-19 pandemic <sup>(12)</sup>, which has had effects on the social, economic and health sphere on a global scale <sup>(13)</sup>.

In this sense, the results of the present study indicate that most children and adolescents practiced some kind of sport (playing ball, cycling, volleyball) or another type of recreational activity before the pandemic, due to the daily routine of conviviality in kindergartens or schools, where they had space to move, play outdoors and perform other activities. However, with the advent of the pandemic this scenario was modified, resulting in social isolation of families, closure of schools and parks, impossibility of outdoor recreation and living with friends.

Sá, et al. <sup>(14)</sup>, in a descriptive cross-sectional study, sought to identify how Brazilian families with children under 13 years of age faced the period of confinement in relation to the time spent on physical activity in their daily routine, reporting that, before social distancing, 67.8% of children practiced physical activity at least twice a week, with this number reduced to 9.77% in the first month of isolation. This data corroborates the results obtained in this study, where sedentary lifestyle was reported by most of the respondents during the pandemic. The reduction in the practice of physical activity can have consequences both at the psychological and physical level, leading to health problems and the emergence of diseases <sup>(14)</sup>.

The reduction in the practice of physical activity seems to be accompanied by increased exposure to screens compared to the period before the pandemic. In this sense, it is worth considering that the recommendation of exposure to screens for children over two years old and under five years of age is up to 1 hour/day, moving to a maximum of 2 hours/day for children between six and ten years old and to the limit of 3 hours/day for adolescents always considering with the supervision of parents and/or guardians <sup>(15)</sup>. The restrictions on the time of exposure to screens are based on the fact that the exacerbated use of electronics affects the cognitive development of children and adolescents, and may trigger psycho-emotional and health problems <sup>(16)</sup>.

When considering the clinical data, it is highlighted that obesity, high cholesterol and other comorbidities were detected in our sample, with half of the diagnoses made after the pandemic. It is known that adult and elderly individuals with obesity exposed to severe acute respiratory syndrome caused by the SARS-CoV-2 virus had worse prognoses, with a higher probability of death. The same applies to children and adolescents, since excess body fat interferes with inflammation, making the immune response slower and/or ineffective<sup>(17,18)</sup>. Thus, it is essential to maintain a balanced and satisfactory diet in nutrients to ensure health and well-being<sup>(19)</sup>.

From this point of view, the increase in snack consumption and the type of snack consumed in the pandemic period stand out. Corroborating the data observed in the present study, Ruíz-Roso et al.<sup>(20)</sup> observed an increase in the consumption of fried and sweet foods from 14.00% to 20.70% during confinement, as well as Bennett et al.<sup>(21)</sup> who showed an increase in the number of snacks and unhealthy food choices (foods rich in energy and low in nutrients). Italian individuals also reported increasing the consumption of chocolates, ice cream, desserts and snacks, in addition to weight gain during the confinement period<sup>(22)</sup>.

A study by Lima et al.<sup>(23)</sup> highlights divergences in food consumption between Brazilian children and adolescents, during social isolation, since, while children consumed all meals more regularly, adolescents often replaced the main meals with snacks and also ate more hamburgers, sweets and sugary drinks. This practice among adolescents can be justified by greater practicality, portion size, availability, high palatability, ease of consumption and the assiduous exposure to advertising of these foods, which increase the chance of consumption of ultra-processed foods<sup>(20,24,25)</sup>.

## CONCLUSION

Given the above, it is observed that the results of the present study are promising, indicating changes in food consumption, in the practice of physical activity and in the state of health of a portion of the sample of children and adolescents from a private school in Recôncavo da Bahia. However, it is worth considering the small extent and sample representativeness (32 students) and the need to observe the results with caution due to the low adherence of parents and/or guardians in answering the online questionnaire.

Thus, we believe that the work offers elements of the need for further investigations, with more expanded samples, in order to know the effect of the restrictions of social interaction imposed by the pandemic on the diet and state of health of children and adolescents, considering the relevance of knowing the health scenario of this public for the planning of targeted, efficient and applicable approaches to Food and Nutrition Education (NEA), through different methodologies, with the

objective of encouraging an adequate and healthy diet aiming at the full growth and development of children and adolescents and health promotion and the prevention of diseases Related to food and nutrition

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