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Post-pandemic nutritional status in school children from an educational institution in Huánuco, Peru

Abstract

Aim: Assess the post-pandemic nutritional status of schoolchildren in an educational institution in Huánuco, Peru.

Methods: a quantitative, descriptive, observational, prospective, cross-sectional study with a comparative descriptive design, with a population of 228 students and a sample of 143 students, who were administered a questionnaire and a registration form after validation. The Mann-Whitney U and Chi-square tests were used for inferential analysis.

Results: 25.2% (36) were overweight and 3.5% (5) were obese. It was found that there was a significant relationship between the frequency of food consumption and nutritional status (P-value=0.014).

Conclusion: It was concluded that the school children presented a normal nutritional status, followed by overweight, obesity and thinness.

Keywords: nutritional status, body mass index, pandemic, malnutrition, schoolchildren (DeCS)

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Introduction

Nutritional statusin schoolchildren from 6 to 12 years old, It is defined as the physical condition in which the individual is[1] as a result of the consumption of their food.[2] Likewise, nutritional status is classified according to the Body Mass Index (BMI),[3] that is, the individual may be thin, normal weight, overweight or obese. Due to the arrival of the pandemic, it has generated an unexpected change in many people, particularly children, with respect to their diet, many children consumed excessively non-nutritional foods[4] as well as other children due to the economic situation of their parents. They stopped eating, affecting their health, and limiting themselves to physical exercise, making them sedentary children.[5]

In Brazil in 2023, Damassini et al.,[4] to the they identified that there was a higher proportion of overweight schoolchildren and a lower amount of Obesity, indicating that there was a significant increase after the pandemic. In Ecuador in 2023, Peralta et al.,[5] identified that 16.6% of schoolchildren were overweight and 12.3% obese. In the same country, in 2021, Lema,[6] identified that 17.2% of schoolchildren were overweight and 4.6% obese. In Lima Peru, in 2021, Lipa et.al.,[7] identified 15.7% of schoolchildren were overweight and 4.5% obese, in Amazonas, Peru, in 2021, Chugden,[8] showed that more than half were overweight and 12.2% They presented obesity. And in Huánuco, in 2019, Minauro,[9] 98.8% were overweight and 1.2% were obese.

For this reason, the present study was carried out with the purpose of knowing how the nutritional status of schoolchildren is after two years of pandemic when they return to classes. Therefore, the objective of the study is to assess the post-pandemic nutritional status in schoolchildren from an educational institution in Huánuco, Peru.

Methods and materials

The study had an observational, prospective, cross-sectional and descriptive quantitative approach, with a comparative descriptive design. This study was developedat the Mirko Artemio Valverde Almeida "MAVA" Educational Institution in the Amarilis district, Huánuco, Peru, during the period of 2022.

The population was made up of 228 schoolchildren, the sample size was 143 schoolchildren through the application of the formula for a finite population, being selected according to selection criteria. Inclusion criteria: schoolchildren enrolled in 2022 from first to sixth grade of primary school and parents who signed the informed consent, exclusion criteria: initial level schoolchildren, those who did not attend on the day of execution and parents who did not sign the consent. And stratified probability sampling was used.

The variable of this study was the post-pandemic nutritional status, which was measured using a record sheet where the weight was collected using a Kambor brand electronic scale, the height using a 2-meter measuring tape, and the Mass Index classification. Body according to the standard deviation of the anthropometric assessment table for women and men from 5 to 17 years of the MINSA (Table 1).[10,11]

Table 1 The anthropometric assessment table for women and men from 5 to 17 years of the MINSA

Classification body mass index (BMI) for age	Standard deviation
Thinness	< -2 SD
Normal	> -2 to < +2 SD
Overweight	≤ +2 SD
Obesity	> +2 DE

Regarding validation, content validity was carried out by 5 expert subject judges and the reliability process was issued because the measurement of the variable is standardized under the technical guide for anthropometric assessment in schoolchildren according to MINSA.[3]

To carry out the study, authorization was requested from the director of the educational institution. The objective of the study was explained to each student from first to sixth grade, respecting the prevention measures against COVID-19. Informed consent was also given to each student who wished to participate so that their parents authorized their participation. Once authorized, during art, tutoring and physical education hours, each student was given the general

characteristics questionnaire, subsequently they were weighed, instructing the students to get on the scale without shoes to have an exact weight and then they were measured without shoes feet together, body pressed against the wall and looking straight ahead. Once the data had been collected, the BMI was assessed and then classified according to the MINSA anthropometric assessment table.[10,11] After that, all the data was emptied into EXCEL 2016 and spss V. 16.

The acquired data were tabulated in statistical tables, they were presented in frequency and percentages, in the case of age, height and weight they were presented in mean, median, mode, standard deviation, variance, minimum and maximum. The Mann-Whitney U and Chi square statistical tests were used to compare the variable with the general characteristics, considering a P-value <0.05 as statistically significant. Statistical analysis was performed in spss V.16.

This study was supported by the Helsinki code of ethics of the World Medical Association (WMA), likewise, the ethical and bioethical principles applicable in all research were applied and, in the same way, Responsible Research Conduct was considered.

Results

Of the total number of schoolchildren in the study, 52.4% (75) were male, predominantly schoolchildren who reported living with their parents, as well as 11.9 (17) ate food more than 5 times every day and much more than half did not perform physical exercises during the day [77.6% (111)] (Table 2).

Table 2 General characteristics of the students of an educational institution in Huánuco, Peru

General characteristics	n=143	
	Fi	%
Biological Genus		
Male	75	52.4
Female	68	47.6
Living with parents or other relatives		
Yeah	131	91.6
No	12	8.4
Frequency of food consumption		
3 times	37	25.9
3 – 5 times	89	62.2
more than 5 times	17	11.9
Frequency of physical exercises		
Yeah	32	22.4
No	111	77.6

Regarding the weight and height of the schoolchildren, when evaluating the weight it was observed that the standard deviation was 8.7253, variance 76.131, minimum 19.8 kg and maximum 63.7 kg. When sizing the students, it was verified that the standard deviation was 0.09361, variance 0.009, minimum 1.14 cm and maximum 1.68 cm (Table 3).

Table 3 Age, weight and height of the schoolchildren from an educational institution in Huánuco, Peru

Sociodemographic characteristics	n=143						
	x	I	Mo	Of	Yes	Min	Max
Age	9.15	9	8	1,911	3,652	6	14
Weight	33,442	32,100	32	8.7253	76,131	19.8	63.7
Size	1.339	1.339	1.3	0.09361	0.009	1.14	1.68

Regarding nutritional status, the formula was used to find the BMI and then classify it; it was observed that 25.2% (36) were overweight and 3.5% (5) were obese (Table 4).

Table 4 Post-pandemic nutritional status in schoolchildren from an educational institution in Huánuco, Peru

Post-pandemic nutritional status	n=143	
	fi	%
Thinness	1	0.7
Normal	101	70.6
Overweight	36	25.2
Obesity	5	3.5
Total	143	100

It was verified that 14.7% (21) of the male schoolchildren were overweight and 2.8% (4) were obese, however, they did not show a significant relationship. 18.9% (27) and 3.5% (5) were overweight and obese schoolchildren who did not perform physical exercises, respectively, however, they did not show a significant relationship. 23.1% (33) were overweight schoolchildren who lived with their parents, however, they did not show a significant relationship. Finally, 47.1% (8) were overweight schoolchildren who ate their food more than 5 times during the day, demonstrating that there is a significant relationship (Table 5).

Discussion of results

According to the results obtained, it is evident that the frequency of food consumption shows a significant relationship with nutritional status. This result agrees with Henderson's 14 needs,[12,13] of which the 2nd need is emphasized, which is to eat and drink appropriately, understanding that the frequency of food consumption will depend on the health status and physical condition of the schoolchildren.

Likewise, it coincides with the model of social determinants of Lalonde,[14] where it shows that, of the 4 determinants, Lalonde[15] focused on the lifestyle of schoolchildren, particularly recognizing the habits and customs that they have been collecting. Since his birth, specifically in his eating habits as a consequence of his physical state.

Studies that coincide with the result of this study, such as that of Gómez et al.,[16] show that there is a significant relationship between the frequency of foods consumed and nutritional status, deducing that as schoolchildren consume more than three times non-nutritious foods, they are more likely to increase their BMI.

Likewise, the study by Castillo et al.,[17] demonstrate that there is a significant relationship between both data, stating that schoolchildren with a higher BMI consume mostly sweet or salty sweets, processed foods and fried foods, just like the schoolchildren in this study, highlighting that their schoolchildren attend a high school sports.

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Table 5 Characteristics of schoolchildren according to post-pandemic nutritional status in schoolchildren from an educational institution in Huánuco, Peru

Characteristics	n=143								
	Thinness		Normal		Overweight		Obesity		P-value
	fi	%	fi	%	fi	%	fi	%	
Sex									0.216
Male	1	0.7	49	34.3	twenty-one	14.7	4	2.8	
Female	0	0	52	36.4	fifteen	10.5	1	0.7	
Living with parents or other relatives									0.752
Yeah	1	0.7	92	64.3	33	23.1	5	3.5	
No, with a family member	0	0	9	6.3	3	2.1	0	0	
Frequency of food consumption									0.014
3 times	1	0.7	31	21.7	4	2.8	1	0.7	
3-5 times	0	0	63	44.1	24	16.8	2	1.4	
more than 5 times	0	0	7	41.2	8	47.1	2	11.8	
Physical exercises									0.886
YEAH	0	0	23	16.1	9	6.3	0	0	
No	1	0.7	78	54.5	27	18.9	5	3.5	

Cordero et al.,[18] shows that overweight and obese schoolchildren tend not to have breakfast before going to their educational institution and frequently consume foods that do not benefit their health every day, concluding that there is a significant relationship between both data.

On the contrary, a study conducted by Rocha et al.,[19] demonstrates that the frequency of food consumption does not have a significant relationship with nutritional status, highlighting that their schoolchildren consumed processed foods, unlike the schoolchildren in this study who did not evaluate the types of foods they frequently consume during the day.

Another study carried out by Carvalho et al.,[20] also indicates that there is no significant relationship between both data, despite the fact that they found a high level of food consumption in schoolchildren who were overweight and obese, without mentioning that they showed a moderate percentage in schoolchildren with excess abdominal fat being prone to developing of cardiovascular diseases.

The study presented main strengths, it was carried out according to the prepared planning, it had the permission of the director of the educational institution Mirko Artemio Valverde Almeida and it had the active participation of schoolchildren from the first to fifth grade of primary school. With the findings found, the nearest health center was presented so that they could carry out timely intervention for those schoolchildren with malnutrition.

Likewise, the study presented certain limitations during data collection such as that some parents did not agree to have their children participate in the study, likewise, some students did not want to participate due to fear that their peers would make fun of their weight, also, applying the instruments required a lot of time, so it was done during tutoring hours and during recess hours so as not to affect class hours.

Conclusion

It is concluded that there is a significant relationship between the frequency of food consumption and the nutritional status of schoolchildren, since during the pandemic schoolchildren have been affected in their eating habits and physical state, due to the fact that, being locked up for 3 years, The children had a sedentary life, they consumed their food frequently, raising their BMI, therefore, it is recommended that the director encourage the kiosk workers to sell nutritious foods and continue working with health professionals by providing educational and demonstration sessions to parents, and parents, to send their children lunch boxes with nutritious foods.

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Conflicts of interest

The authors declare that there is no conflict of interest.

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