Carta al Editor / Letter to the Editor

Reply to Letter to the Editor by Antunes et al

Respuesta a la Carta al Editor de Antunes et al

Luana Lara Rocha^{1*}. <https://orcid.org/0000-0002-5963-6033>.

Olivia Souza Honório². <https://orcid.org/0000-0003-4174-6987>.

Ariene Silva do Carmo³. <https://orcid.org/0000-0002-3421-9495>.

Maria Izabel de Castro Magalhães Fortes⁴. <https://orcid.org/0000-0002-7446-0750>.

Cristiane de Freitas Cunha⁵. <https://orcid.org/0000-0003-2216-7904>.

Tatiana Resende Prado Rangel de Oliveira⁶. <https://orcid.org/0000-0002-2487-6379>.

Larissa Loures Mendes⁴. <https://orcid.org/0000-0003-0776-6845>

1. Departamento de Medicina Preventiva e Social, Faculdade de Medicina, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

2. Departamento de Nutrição, Universidade Federal de Ouro Preto, Ouro Preto, Minas Gerais, Brazil.

3. Ministério da Saúde, Brasília, Brazil.

4. Departamento de Nutrição, Escola de Enfermagem, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

5. Departamento de Pediatria, Faculdade de Medicina, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

6. Departamento de Nutrição, Pontifícia Universidade Católica de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

*Corresponding author: Luana Lara Rocha.

E mail: luanalararocha@gmail.com

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Dear Editor

We thank Antunes et al. for the comments to the article "Consumption of school meals provided by PNAE among Brazilian public school adolescents"¹. We are pleased that Antunes et al. recognizes the relevance of our study. We understand that Antunes et al. are criticizing (1) the categorization of the variables; (2) the use of socioeconomic score; (3) the choice of confounders; (4) and other minor points.

The article "Consumption of school meals provided by PNAE among Brazilian public school adolescents"¹ was conducted using data from the Study of Cardiovascular Risks Among Adolescents (ERICA), which had a sample of 58,707 Brazilian adolescents from public schools in cities with over 100,000 inhabitants. Of these adolescents, 895

(1.52% of the sample) were from schools that did not offer school meals, 23,108 did not consume school meals, 24,623 consumed school meals sometimes, 6,701 consumed school meals almost every day, and 3,380 consumed school meals every day.

The statement that we should have excluded adolescents from schools that did not offer school meals from the sample is correct. However, there was no overestimation of low school feeding compliance. When excluding the 895 adolescents from schools that did not offer school meals, the prevalence of adolescents not regularly consuming school meals is 17.4% (versus 17.2% in the Honório et al.¹ article). The use of the article by Vale et al.² with data from the National School Health Survey (PeNSE) to argue about adherence to school feeding should be thought of carefully.

PeNSE has a different methodology than the one used in ERICA. In the study by Vale et al.², the weekly frequency of school meal consumption is evaluated, and high adherence was considered when adolescents consumed school meals five times a week. Even with a different methodology, the prevalence of adherence to school meals was similar to that found in our study (9.5% of adolescents consumed 3 to 4 times a week, and 26.3% consumed it every day²). In a more recent study with data from the PeNSE (2015), which cited our study, the prevalence of school feeding adherence was 21.5%³. Furthermore, it should be noted that the exclusion of 895 adolescents from the sample does not change the results presented in the multivariate model.

Regarding the use of the socioeconomic score, the purpose of using it in our study is not to characterize the sample as to income distribution and socioeconomic level. The objective is to verify whether there is an association between adherence to school feeding and socioeconomic level. By using the Brazilian Economic Classification Criterion (CCEB), we would have a sample loss of about a quarter, due to missing data for the maternal schooling variable. Thus, we chose to use the socioeconomic proxy developed by Moura⁴ in her doctoral thesis. The socioeconomic proxy, renamed in our study as socioeconomic score, was built from the variables used in the BECC, but removing only the maternal education variable. From this new variable, Moura⁴ categorized the results into three equal intervals (low socioeconomic score: 0 to 12; medium socioeconomic score: 13 to 25; and high socioeconomic score: 26 to 38). Moreover, this new variable has a good equivalence with the CCEB⁴ classification.

Regarding the choice of variables for the regression model, the study aimed to assess the factors associated with the consumption of school meals. We studied the factors identified in previous studies found in the literature that pointed out that these variables are associated with adherence to school meals^{5,6,7,8,9}. Thus, for the multivariate model, a modeling strategy that is widely used in epidemiological studies was adopted. Initially, a bivariate analysis was performed, and the variables with a p-value lower than 0.05 (we chose a stricter cutoff point due to the large sample size) were selected to compose the multivariate model. The backward method was used to reach in the final multivariate model, in which all explanatory variables, when adjusted for each other, were statistically significant (<0.05).

Antunes et al. also pointed out the existence of collinearity in our model. Collinearity exists when observing a strong correlation between two or more predictors in a regression model. One of the diagnostic tests to check for collinearity is the Variance Inflation Factor (VIF), which is a measure of the effect of other predictor variables on a regression coefficient. Large VIF values (a common benchmark is 10.0) indicate a high degree of collinearity or multicollinearity among the predictor variables¹⁰. If the average VIF value is not substantially greater than 1, it indicates that there is no cause for concern. There is indeed an association

between socioeconomic status, but these variables are not highly correlated, to provide the same information. In our study, when explanatory variables socioeconomic score and race were tested, a VIF value of 1.03 was observed, pointing to the absence of collinearity. We understand it is a basic assumption of multivariate models and this issue was treated with due rigor.

In table 1 we present a characterization of our study sample, presenting the absolute and relative frequency of the variables included in the study. Moreover, about the p-value, there are no rules about its presentation or not together with the confidence intervals, it was an option of us as authors and that the journal's rules allowed. The presentation of the table is a choice of the authors and must follow the journal chosen for publication. In addition, it should present the necessary information to support the conclusion of the study.

Finally, our study did not evaluate the sale of food around the school and its association with adherence to school meals. In addition, we also did not have continuous variables that would justify the use of measures of position and central tendency. The authors acknowledge these limitations, but we consider the reviewers did not point out anything about this issue, and we understand it neither compromise the quality of the study nor it harm the methodology. Furthermore, the results of the study are important to demonstrate the importance of actions aimed at increasing adherence to school meals and valuing the National School Meals Program (PNAE). In addition, it is important to indicate the need for the regulation of food sales in the school food environment (a necessary issue to advance the agenda of reducing the consumption of ultra-processed foods in the school food environment).

In conclusion, the authors thank Antunes et al. for their considerations and the Revista Chilena de Nutrición for the opportunity to clarify some aspects of the methodology we adopted conducting the study. We always value quality scientific evidence with rigor based on nutritional epidemiology. We reinforce the importance of the results for the current scenario of discussion of the PNAE and the food environment in Brazilian schools, following the expanded concept detailed by the FAO¹¹. It considers the school food environment as "all spaces, infrastructure, and conditions in and around the school premises where food is available to be purchased and/or consumed (for example canteens, food vendors, food stores, kiosks, vending machines, among others). This environment also includes all available information, promotion (marketing, advertisements, branding, food labels, packages, and promotions), and the pricing of food and food products"¹¹.

REFERENCES

1. Honório OS, Rocha LL, Fortes MICM, Carmo AS, Cunha CF, Oliveira TRPRO, et al. Consumption of school meals provided by PNAE among Brazilian public school adolescents. *Rev Chil Nutr*. 2020; 47: 765-771.

2. Vale D, Lyra CO, Santos TT, Souza CVS, Roncalli AG. Adesão à alimentação escolar por adolescentes brasileiros: determinantes individuais e do contexto escolar. *Cienc Saude Colet.* 2021; 26: 637-650.
3. Boklis-Berer M, Rauber F, Azeredo CM, Levy RB, Louzada MLda C. School meals consumption is associated with a better diet quality of Brazilian adolescents: Results from the PeNSE 2015 survey. *Public Health Nutr.* 2021: 1-26.
4. Moura LRDE. Fatores associados aos comportamentos de risco para a saúde em adolescentes de Belo Horizonte: Um recorte do Estudo de Riscos Cardiovasculares em Adolescentes (ERICA). Tese. Belo Horizonte: Faculdade de Medicina, Universidade Federal de Minas Gerais. 2017.
5. Sturion GL, Silva MV da, Ometto AMH, Furtuoso MCO, Pipitone MAP. Fatores condicionantes da adesão dos alunos ao Programa de Alimentação Escolar no Brasil. *Rev Nutr.* 2005; 18: 167-181.
6. Silva CAM, Marques LA, Bonomo E, Bezerra OMPA, Correa MS, Passos LSF, et al. The National School Meals Program from the perspective of students from the state school system in Minas Gerais, Brazil. *Cien Saude Colet.* 2013; 18: 963-969.
7. Locatelli NT, Canella DS, Bandoni DH. Factors associated with the consumption of school meals by adolescents in Brazil: Results from PeNSE 2012. *Cad Saude Pública.* 2017; 33: e00183615.
8. Rocha NP, Filguerias MS, Albuquerque FM, Milagres LC, Castro APP, Silva MA, et al. Analysis of the national school feeding program in the municipality of Viçosa, MG, Brazil. *Rev Saude Publica.* 2018; 52: 1-10.
9. Cesar JT, Taconeli CA, Osório MM, Schmidt ST, Cesar JT, Taconeli CA, et al. Adherence to school food and associated factors among adolescents in public schools in the Southern region of Brazil. *Cienc Saude Colet.* 2020; 25: 977-988.
10. Hair JF, Anderson RE, Tatham RL, Black WC. *Análise Multivariada de Dados.* 5th ed. Porto Alegre, Bookman, 2005.
11. Food and Agriculture Organization of the United Nations (FAO). *School Food and Nutrition Framework.* Rome, 2019.