FOOD INSECURITY IN AN ACADEMIC COMMUNITY DURING THE COVID-19 PANDEMIC

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ABSTRACT

This study aimed to investigate food insecurity in the academic community during the pandemic. Cross-sectional study with collection from an online questionnaire between October 2020 and February 2021 with undergraduate and graduate students, technical-administrative staff, and professors from federal university of Rio Grande do Norte. The questionnaire contained socioeconomic variables and the validated Brazilian Food Insecurity Scale. The average age of the participants was 27 years, most were female (65.7%) and 30.2% had an income between 1 and 3 minimum wages.

Food insecurity was higher among undergraduates with 34.4% mild food insecurity, 10.6% moderate food insecurity, and 5.5% severe food insecurity. Logistic regressions showed that undergraduates and graduate students had the highest OR for food insecurity, with increased or reduced income and weight being associated with greater chances of food insecurity during the pandemic. Thus, the study demonstrated a significant presence of food insecurity in the academic community, especially among undergraduate and graduate students.

KEYWORDS: Food and nutrition security, COVID-19, Pandemic, Universities, Brazil.

INSEGURANÇA ALIMENTAR EM UMA COMUNIDADE ACADÊMICA DURANTE A PANDEMIA DE COVID-19

RESUMO

O objetivo do estudo foi investigar a insegurança alimentar na comunidade acadêmica durante a pandemia. Estudo transversal com coleta em questionário online entre outubro de 2020 e fevereiro de 2021 com alunos de graduação e pós-graduação, servidores e docentes da Universidade Federal do Rio Grande do Norte. O questionário continha variáveis socioeconômicas e a Escala Brasileira de Insegurança Alimentar, já validada. A idade média dos participantes foi 27 anos, sendo maioria do sexo feminino (65,7%) e 30,2% possuíam renda entre 1 e 3 salários mínimos. A

insegurança alimentar foi maior entre os graduandos com 34,4% insegurança alimentar leve, 10,6% insegurança alimentar moderada e 5,5% insegurança alimentar severa. Regressões logísticas mostraram que graduandos e pós-graduandos tiveram maiores OR para insegurança alimentar, com o aumento ou redução da renda e do peso associados a maiores chances de insegurança alimentar durante a pandemia. O estudo demonstrou presença significativa da insegurança alimentar na comunidade acadêmica, principalmente entre alunos de graduação e pós-graduação.

Palavras chave: Segurança alimentar e nutricional; COVID-19; Pandemia; Universidades; Brasil.

1   INTRODUCTION

Food insecurity is present when the individual has limited or uncertain possibilities to acquire food in a socially acceptable way, and the availability of nutritionally adequate and safe food is compromised. This insecurity can range from the fear of not being able to obtain food to a state of hunger due to a food shortage (El-Sayed et al., 2010; Miller et al., 2011; PENSSAN, 2022).

One of the major influencers of this situation of vulnerability, considered a problem, is the inability to access, especially related to the lack of economic conditions to acquire the food that is needed (FAO, 2023; Willows et al., 2011). Given the COVID-19 scenario, these existing vulnerabilities are amplified (FAO, 2023; PENSSAN, 2023).

The coronavirus disease is spreading rapidly and intensely, with more than 536 million cases and 6.3 million deaths recorded worldwide in June 2022 in absolute numbers, according to statistics from the World Health Organization (WHO), with Brazil being the third country with the highest number of infected and the second with the highest number of deaths (World Health Organization, 2021).

Due to the lack of sufficient knowledge about the virus and how to treat it, the strategy recommended by the WHO and adopted in most countries was social distancing. The measure was taken based on previous pandemics, which showed the importance of social distancing at the beginning of a health crisis to prevent the spread of the disease (CRC, 2020; Magalhaes et al., 2020)

Although the crisis is essential of a sanitary nature, it has affected other areas, especially the economic one, due to the stoppage of activities, mainly industrial and commercial. And this economic crisis ends up affecting the population in general, interfering with citizens' income, which can compromise access to essential needs, such as housing, water, and food (Magalhaes et al., 2020; Pereira & Oliveira, 2020).

When eating is compromised, the individual may be more likely to enter a state of food insecurity. In this sense, it is necessary to monitor the presence of food insecurity among the population, identifying vulnerable groups so that they can be removed from this condition and promoted to food security (FAO, 2023; Panigassi et al., 2008).

In this context, the academic community, especially undergraduates, can be considered a population at risk for food insecurity that may have been disproportionately impacted by the COVID-19 pandemic (Jehi et al., 2023). Studies consistently show that undergraduates have high rates of food insecurity, which is associated with poorer food quality, poor mental health, and poor academic performance (Jehi et al., 2023; Nikolaus et al., 2020; Niles et al., 2020; Owens et al., 2020; Wolfson & Leung, 2020).

While much remains to be known about COVID-19, the influence of this pandemic on food security is unquestionable. It is necessary to identify the situation of food insecurity in the academic community to clarify and align actions to face the situation without disregarding the various dimensions of food insecurity. And yet, provide evidence for the elaboration and

implementation of public policies aimed at guaranteeing the human right to adequate food, aiming at food security for the academic community. Understanding food insecurity in the academic community can help clarify the associated variables and provide a basis for planning specific actions for this population. Therefore, the objective of the present study was to investigate food insecurity in the academic community during the COVID-19 pandemic.

2 METHODOLOGY

2.1 Ethics

This study was approved by the ethics committee of the Onofre Lopes University Hospital, Federal University of Rio Grande do Norte (UFRN), CAAE 35918620.7.0000.5292. Participants were invited by email to participate in the research. The e-mail directed the participants to the Free and Informed Consent Term (ICF) through a link, which describes the objectives and methodology of the research. At the end of the document, the option "I have read the ICF" and "I agree" or "I do not agree" to participate in the research was available. By clicking on "I agree" to participate in the research, the participant received by e-mail a copy of the informed consent signed by the researcher responsible for the study, and remotely registered the consent to participate in the study. All ethical precepts contained in CNS Resolution No. 466 of 2012 were followed.

2.2 Study design and participants

This is a descriptive, observational, and cross-sectional study whose collection was carried out between October 2020 and February 2021. The study was carried out with the academic community of the Federal University of Rio Grande do Norte. According to UFRN's estimate, the academic community in 2019 consisted of 30,456 undergraduates, 14,337 graduate students, and 5,403 employees, including technical-administrative and permanent professors, in addition to substitute and visiting professors (SIGRH/UFRN, 2019; UFRN, 2019).

Students enrolled in regular undergraduate, and graduate courses, active professors from the faculty, and technical-administrative employees were invited to participate. The inclusion criteria were being over 18 years old and active in the UFRN system. No exclusion criteria were used to participate in the research project. To calculate the sample size, the following parameters were used: estimated proportion of 50% (multiple outcomes), the margin of error of 5%, non-response rate of 30%, and population size of 50,196, according to UFRN's 2019 estimates (SIGRH/UFRN, 2019; UFRN, 2019). Thus, the calculated sample size was of 1089 participants, and non-probability sampling was used.

To test and adjust the online form, a pilot study was carried out with 466 participants to enable the applicability of the research instrument. Soon after, the form was reviewed and sent and a total of 1549 consented to participate in the study, with 124 exclusions due to duplicity of responses and incomplete completion of the questionnaire, totaling 1421 participants (Figure 1).
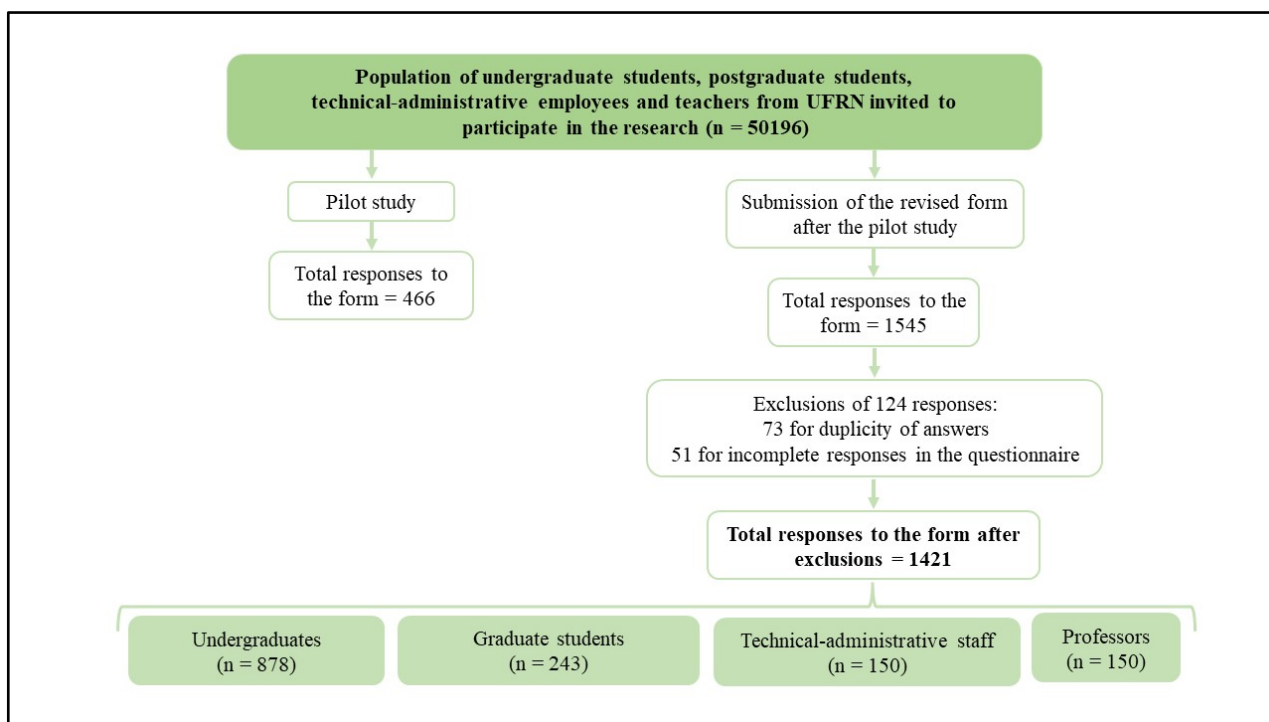
Figure 1: Research diagram and population studied (n=1421).

The questionnaire was sent to the institutional electronic addresses (emails) provided by the University, which was answered online, using the Google Forms platform (Google Forms). This platform allows the creation of custom forms and data collection for online surveys. One of the advantages is that the information is automatically connected to a spreadsheet, making it easier to tabulate the data. The tool also allows the confidentiality of the data obtained, so that the participants cannot see the answers of the others. The questionnaire contained socioeconomic questions (age, sex, ethnicity, marital status, family income, and change in family income during the pandemic), weight change during the pandemic, and food insecurity, as described below.

2.3 Food insecurity assessment

The Brazilian Food Insecurity Scale (EBIA) in its adapted and validated version was used to investigate food insecurity. The EBIA adaptation and validation process was conducted by a group of researchers from the State University of Campinas - Unicamp (BRASIL, 2014).

The EBIA is a direct measure of food insecurity and provides strategic information for the management of social policies and programs, as it allows both the identification and quantification of social groups at risk of food insecurity (FI) and their determinants and consequences. This is a tool with an excellent cost-effectiveness ratio that has been used in several countries, and whose application and analysis showed that there are aspects common to different sociocultural contexts and that represent the degrees of severity of AI (Coates et al., 2006; Swindale & Bilinsky, 2006). Based on the perception of the experience of each individual or family in the last ninety days, the EBIA indicates the degree of food insecurity. The EBIA analysis is based on the sum of affirmative

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answers to 14 questions for households with children under 18 and 8 questions for households without children under 18. The cutoff points and level of food security/insecurity are presented in Table 1.

Table 1. Description of the degrees of food (in)security and cutoff points.

Food security situation	Cutoff points (affirmative responses)		Description
	Households with children under 18	**Households without children under 18**	
Food security	0	0	The family/household has regular and permanent access to quality food, in sufficient quantity, without compromising access to other essential needs
Mild food insecurity	1 – 5	1 – 3	Concern or uncertainty about access to food in the future; inadequate food quality resulting from strategies that aim not to compromise the quantity of food
Moderate food insecurity	6 – 9	4 – 5	Quantitative reduction of food among adults and/or disruption in eating patterns resulting from lack of food among adults
Severe food insecurity	10 – 14	6 – 8	Quantitative reduction of food among children and/or disruption in eating patterns resulting from food shortages among children; hunger (when someone goes all day without eating for lack of money to buy food)

Source: Ministry of Social Development and Fight against Hunger (BRASIL, 2014)

2.4   Statistical analysis

For statistical analysis, data from the online form were exported to a spreadsheet in Excel® 2010, and the variables were then coded. Descriptive and inferential data analysis was performed using the IBM SPSS 20.0 program. Categorical variables were presented as absolute and relative frequencies, and the chi-square test was used to assess the frequency distributions of categorical variables. Continuous variables were tested for normality using the Kolmogorov–Smirnov test. Data without normal distribution were presented as median (Q1–Q3) and analyzed using the Kruskal–Wallis test.

Correspondence analysis was performed to explore the associations of degrees of food insecurity with the institutional linkages of the population studied. This approach summarizes information from categorical variables in a few dimensions, explaining the maximum amount of variability contained in the variables included in the analysis, through the inertia calculated by the model. The objective of the analysis is to explain the greatest inertia or variation, with the least number of dimensions, which are calculated by the model. Correspondence analysis assumptions are homogeneity of variance between row and column variables, variables without zero entries, preferably with more than three categories, and without negative values. The results were represented on a graphic map, showing each category of variables as a point, plotted on the dimensions constructed by the analysis. The closer the points, the stronger the relationship between the categories (Greenacre M, 1992).

In addition, the variables that showed a significant association in the univariate analysis with food insecurity were used for logistic regression models, mainly in the bivariate analysis, exploring the effect of a single variable on food insecurity, with the odds ratios (OR) unadjusted and their respective 95% confidence intervals (95% CI) demonstrated. Then, logistic regression models were calculated, considering food insecurity as a dependent variable. Race, sex, age, institutional affiliation, change in income during the pandemic, and change in weight during the pandemic were included in the final model as independent variables. Adjusted odds ratios (AOR) and their respective 95% CI were presented. Those lower than 0.01 were considered significant p-values, given the large size of the sample, to avoid type 1 errors.

3   RESULTS

The study had the participation of 1421 participants, with a higher percentage of female individuals (65.7%), and this percentage was even higher among graduate students (74.9%, p = 0.004). The median age was 27.0 (22.0 - 37.0), being higher among the professors, 46.0 (38.0 - 55.0). Most self-declared white (54.5%), with 8.2% declared black and 36.5% brown. Family income was mainly between 1 and 3 minimum wages (30.2%), with undergraduates having none or even 1 minimum wage (28%), and among professors, 94% had more than 6 minimum wages (p = 0.000) (Table 2).

In addition, we found that during the pandemic there was a change in income, mainly to less (45.3%, p = 0.000), especially among undergraduate students (50.8%). There was a change in weight for more during the pandemic in most respondents (63.3%, p = 0.000), with the biggest changes among graduate students (68.1%), followed by undergraduate students. (63.8%) (Table 3).

Table 2. Characterization of the academic community during the COVID-19 pandemic (n=1421).

Variables	Total	Undergraduates	Graduates	Technical-administrative	Professors	p value[1]
Sex						
Male, n (%)	487 (34.3)	307 (35.0)	61 (25.1)	58 (38.7)	61 (40.7)	0.004

Female, n (%)	934 (65.7)	571 (65.0)	182 (74.9)	92 (61.3)	89 (59.3)	
Age, median (Q1 - Q3)	27.0 (22.0 - 37.0)	24.0 (21.0 -29.0)	30.0 (26.0 - 35.0)	38.5 (33.0 - 49.0)	46.0 (38.0 - 55.0)	0.000
Race						
Yellow/Asian, n (%)	6 (0.4)	4 (0.5)	2 (0.8)	0 (0.0)	0 (0.0)	0.016
White, n (%)	774 (54.5)	444 (50.6)	141 (58.0)	89 (59.3)	100 (66.7)	
Indigenous, n (%)	6 (0.4)	2 (0.2)	1 (0.4)	1 (0.7)	2 (1.3)	
Brown, n (%)	518 (36.5)	346 (39.4)	81 (33.3)	51 (34.0)	40 (26.7)	
Black, n (%)	117 (8.2)	82 (9.3)	18 (7.4)	9 (6.0)	8 (5.3)	
Civil status						
Married, n (%)	306 (21.5)	90 (10.3)	64 (26.3)	72 (48.0)	80 (53.3)	
Stable union, n (%)	127 (8.9)	56 (6.4)	29 (11.9)	22 (14.7)	20 (13.3)	
Divorced, n (%)	51 (3.6)	26 (3.0)	3 (1.2)	5 (3.3)	17 (11.3)	0.000
Widower, n (%)	6 (0.4)	1 (0.1)	1 (0.4)	1 (0.7)	3 (2.0)	
Single, n (%)	931 (65.5)	705 (80.3)	146 (60.1)	50 (33.3)	30 (20.0)	
Family income in minimum wage						
None	51 (3.6)	47 (5.4)	4 (1.6)	0 (0.0)	0 (0.0)	0.000
0 – 1	208 (14.6)	198 (22.6)	10 (4.1)	0 (0.0)	0 (0.0)	
1 - 3	426 (30.2)	326 (37.1)	90 (37.0)	12 (8.0)	1 (0.7)	
3 – 6	293 (20.6)	177 (20.2)	61 (25.1)	47 (31.3)	8 (5.3)	
6 – 9	168 (11.8)	57 (6.5)	40 (16.5)	41 (27.3)	30 (20.0)	
9 – 12	122 (8.6)	28 (3.2)	23 (9.5)	29 (19.3)	42 (28.0)	
12 – 15	59 (4.2)	19 (2.2)	6 (2.5)	15 (10.0)	19 (12.7)	
> 15	91 (6.4)	26 (3.0)	9 (3.7)	6 (4.0)	50 (33.3)	
Family income change during the pandemic						
No, n (%)	633 (44.5)	329 (37.5)	108 (44.4)	96 (64.0)	100 (66.7)	0.000
Yes, for more, n (%)	144 (10.1)	103 (11.7)	31 (12.8)	5 (3.3)	5 (3.3)	
Yes, for less, n (%)	644 (45.3)	446 (50.8)	104 (42.8)	49 (32.7)	45 (30.0)	
Weight change during the pandemic						
No, n (%)	147 (10.6)	71 (8.3)	25 (10.5)	16 (10.8)	35 (24.1)	0.000
Yes, for less, n (%)	362 (26.1)	239 (27.9)	51 (21.4)	39 (26.4)	33 (22.8)	
Yes, for more, n (%)	879 (63.3)	547 (63.8)	162 (68.1)	93 (62.8)	77 (53.1)	

[1]The Chi-square test was used for categorical variables, and the Kruskal-Wallis test was used for the quantitative variable age.

Considering food insecurity due to institutional affiliation (Figure 2), we observed that undergraduates presented 34.4% of mild food insecurity, 10.6% of moderate food insecurity, and 5.5% of severe food insecurity, and 49.2 presented food security. Graduate students have 24.7% mild food insecurity, 4.9% moderate food insecurity, 2.9% severe food insecurity, and 67.5% food security. The technical-administrative servers showed 13.3% mild food insecurity, 0.7% moderate food insecurity, none (0.0%) severe food insecurity, and 86.0% food security. Most of professors had food security (92.7%), 6% had mild food insecurity, 0.7% had moderate food insecurity, and 0.7% had severe food insecurity (Figure 2).
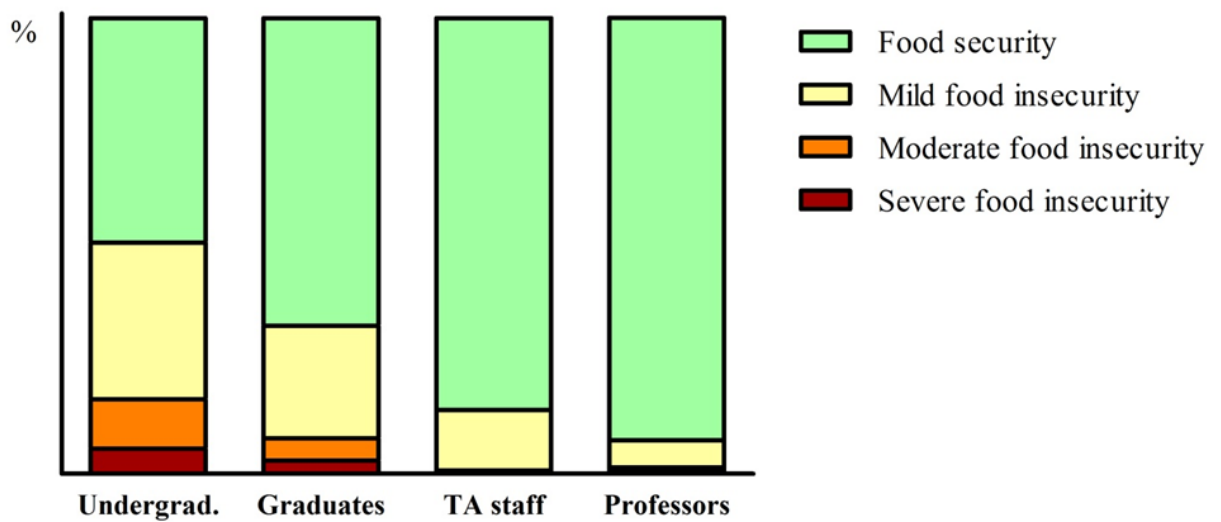
Figure 2: Studied population according to institutional position and food insecurity during the COVID-19 pandemic. Undergrad.: undergraduates (n = 878); Graduates (n = 243); TA staff: Technical-administrative staff (n = 150); Professors (n = 150).

Correspondence analysis showed that undergraduates were closer to all degrees of food insecurity, mild, moderate, and severe. Graduate students presented mild food insecurity and food security, while technical-administrative and professors presented food security. The total inertia of the model was 11.5%, meaning that belonging to one of the groups studied explains 11.5% of food insecurity (Figure 3).

Logistic regression (Table 3) highlights even more the association between food insecurity and undergraduates (AOR = 10.74; 95% CI = 5.50 – 20.95) and graduate students (AOR = 5 .25; 95% CI = 2.60 - 10.73). The change in income during the pandemic also increased the chance of food insecurity, both when there was a decrease in income (AOR = 3.03; 95% CI = 2.34 – 3.91) and for an increase in income (AOR = 1.81; 95% CI = 1.22 - 2.70). Food insecurity was also associated with weight gain or loss during the pandemic (AOR = 2.02; 95% CI = 1.28 - 3.20; AOR = 2.23; 95% CI = 1.39 - 3, 65, respectively).
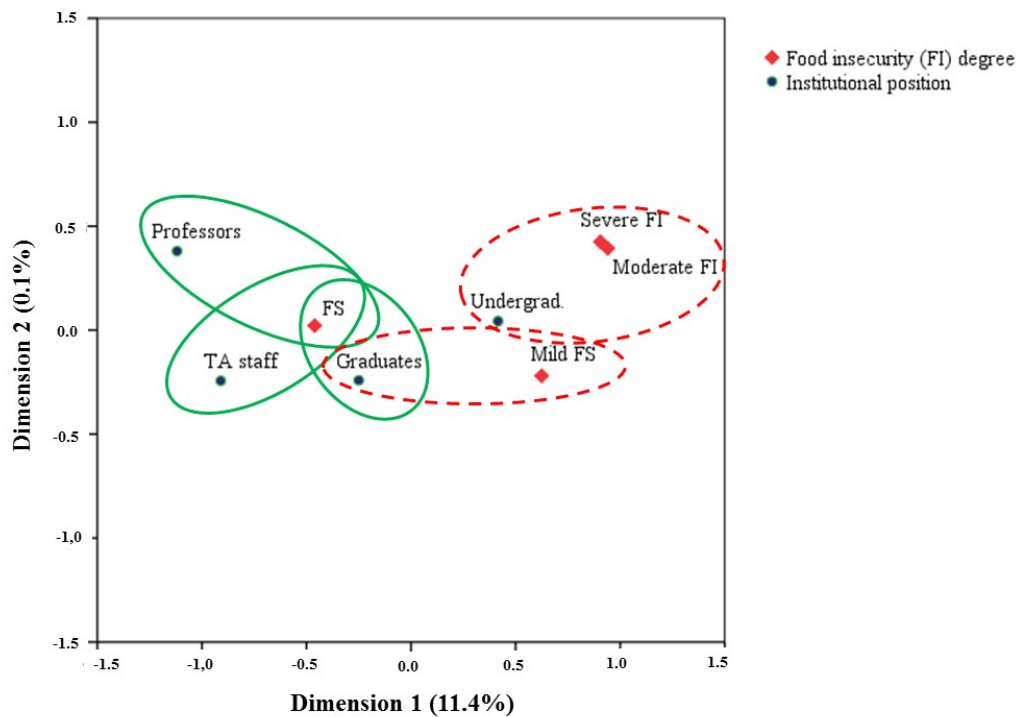
Figure 3: Correspondence map between food insecurity assessed by the Brazilian food insecurity scale in the studied undergraduates (n = 878), graduate students (n = 243), technical-administrative staff (n = 150), and professors (n = 150). The red diamonds represent the food insecurity classification categories: Food Security (FS), Mild Food Insecurity (Mild FI), Moderate Food Insecurity (Moderate FI), and Severe Food Insecurity (Severe FI). The blue dots correspond to the studied groups. The total inertia of the model was 11.5%, dimension 1 explained 99.0% of the model, and dimension 2, 1.0%.

Table 3. Logistic regression for variables associated with food insecurity in the academic community during the COVID-19 pandemic.

Independent variables	Food insecurity			
	OR (95% CI)	p value	AOR (95% CI)	p value
Sex				
Male	-		-	
Female	1.28 (1.02 - 1.61)	0.031	1.17 (0.91 - 1.51)	0.221
Race/color				
White	-		-	
Yellow/Asian	1.05 (0.19 - 5.79)	0.952	0.51 (0.09 – 2.94)	0.453
Indigenous	1.00 (0.09 - 11.3)	1.000	1.71 (0.22 - 13.57)	0.612
Brown	1.59 (0.29 - 8.73)	0.597	1.31 (1.02 – 1.70)	0.033
Black	1.90 (0.34 - 10.78)	0.469	1.57 (1.02 – 2.42)	0.043
Institutional position				
Professor	-		-	
Undergraduate	13.05 (6.96 - 24.45)	0.000	10.74 (5.50 – 20.95)	< 0.0005
Graduate student	6.09 (3.12 - 11.90)	0.000	5.25 (2.60 – 10.73)	< 0.0005
Technical-administrative staff	2.06 (0.96 - 4.43)	0.066	2.06 (0.92 - 4.61)	0.070
Family income change during the pandemic				

No	-		-	
Yes, for less	3.64 (2.86 - 4.62)	0.000	3.03 (2.34 – 3.91)	< 0.0005
Yes, for more	2.48 (1.70 - 3.62)	0.000	1.81 (1.22 - 2.70)	< 0.0005
Weight change during the pandemic				
No	-		-	
Yes, for more	2.58 (1.70 - 3.93)	0.000	2.02 (1.28 - 3.20)	0.001
Yes, for less	2.83 (1.81 - 4.43)	0.000	2.23 (1.39 - 3.65)	0.003
Age	0.95 (0.94 - 0.96)	0.000	0.99 (0.98 - 1.01)	0.214

OR: unadjusted odds ratio; 95% CI: 95% confidence interval. p values < 0.05 were considered significant.

4   DISCUSSION

The results of this study showed a strong association of food insecurity in the studied population with institutional bonds, with emphasis on undergraduate and graduate students. The increase or decrease in income and weight during the pandemic were also associated with greater chances of food insecurity. Although there is a paucity of published research on the prevalence of food insecurity in the academic community, many of the results of this study are associated with findings from previous research conducted on undergraduate (Davitt et al., 2021; Maciel et al., 2022; Soldavini et al., 2021) and graduate students (Mialki et al., 2021; Sackey et al., 2021). Thus, this is possibly the first study that explores food insecurity encompassing the academic community in a more comprehensive way, represented here by undergraduate, graduate students, technical-administrative, and professors.

A recent study carried out by our group with undergraduates from Brazilian universities in all regions of the country identified a prevalence of 38.6% of food insecurity during the COVID-19 pandemic (Maciel et al., 2022). A higher percentage of food insecurity was identified in the present study with 50.5%, that is, more than half of the undergraduates had some degree of food insecurity, with 5.5% having severe food insecurity and 10.6% moderate food insecurity. This reinforces that this population is more vulnerable and corroborates the increase in food insecurity expected due to the COVID-19 pandemic (Davitt et al., 2021; Nikolaus et al., 2020; Niles et al., 2020; Owens et al., 2020; Soldavini et al., 2021; Wolfson & Leung, 2020).

Data for the year 2020 from the National Survey on Food Insecurity in the Context of the COVID-19 Pandemic in Brazil, point out the food insecurity index was above 70% in the Northeast - while the national percentage is 55.2%. Severe food insecurity (hunger), which affected 9.0% of the Brazilian population as a whole, was present in 13.8% of the Northeast (PENSSAN, 2021). Identifying that this region of Brazil where the present study was carried out is one of the most vulnerable to food insecurity in the country.

This large percentage of food insecurity may also have been influenced by the closing of institutional university restaurants during the pandemic, which provided university students with healthy/adequate/safe meals at low prices and free for the most vulnerable students. As well as fairs were closed as a measure to contain the spread of COVID-19 (Nicola et al., 2020; Nogueira, 2018). Thus, these measures may have had an impact on ensuring food security for the academic

community, especially undergraduate and graduate students, who depended on fairs to purchase food.

The scenario of food insecurity in university students has a potential impact not only on lower academic performance but is also associated with worse food quality, health problems, increased risk of chronic diseases, worsening of mental health, and greater mental suffering. due to stress demand (Niles et al., 2020; Owens et al., 2020; Payne-Sturges et al., 2018; Willis, 2021).

On the other hand, it should be noted that food security was greater among professors, who also had a higher monthly family income, which probably favored this group with better quality of access and in sufficient quantity to guarantee food security. However, the overload of work demands, adaptation to remote work, and increase in depression are demonstrated in other studies during the COVID-19 pandemic (Martin et al., 2022), compromising the health and quality of life of this population.

This study showed that the social and economic impacts of the pandemic are associated with food insecurity in the academic community, as the increase or decrease in income during the pandemic was also associated with an increase in the chances of food insecurity. Low income poses a threat to food security, as discussed in other studies (IBGE, 2020a; Martin et al., 2022; Owens et al., 2020; Rodrigues et al., 2022; Sousa et al., 2019; Willis, 2021). The increase in income during the pandemic can be explained by the benefit of emergency aid provided by the federal government to low-income people without formal employment (Alpino et al., 2020). However, this benefit may not have been sufficient to guarantee food security, as discussed by Maciel et al. (2022), given the increase in inflation, especially for food.

In a scenario of high food prices, reduced income decrease purchasing power, especially for low-income families. According to data from the Broad National Consumer Price Index, spending on food and beverages increased by 2.24% in November 2020, mainly driven by the increase in meals eaten at home, which increased by 2.89%. Among foods, the biggest increases were observed in the prices of soybean oil, polished rice, tomato, milk, and meat (IBGE, 2020b). It is important to highlight that these foods constitute the basis of the Brazilian diet, and any price variation can make it difficult to access healthy foods that are adequate to their needs.

Weight gain or loss was also associated with greater odds of food insecurity. These findings may be related to the poor nutritional quality of the food consumed, more perceived stress, and food deprivation (Pryor & Dietz, 2022). Weight gain is possibly associated with the quality of the diets consumed, while weight reduction is associated with food deprivation. Studies have consistently shown that consuming a diet based on fast food's or ultra-processed foods is associated with overweight and chronic disease (Lam & Adams, 2017; Monteiro et al., 2018).

Some limitations of this study should be mentioned, as the online data collection may have restricted the participation of those who did not have access to the internet. However, at the time of data collection, the university already had online classes (remote), and those vulnerable students who requested internet assistance received it. The non-probabilistic sample may have given selection bias for the motivation to answer the questionnaire, which may have been higher in those most affected by the pandemic. A posteriori power analysis was performed using the chi-square test (X^2), considering the sample size (n=1421), using the GPower software. The power

achieved was 90%, assuming a small effect size at 0.10 and alpha at 0.05. This study was also aimed at understanding those most affected by the pandemic so that actions could be implemented.

The implications of the COVID-19 pandemic on the prevalence of food insecurity need to be explored in the longer term. Future studies need to assess the effectiveness of initiatives to reduce the prevalence of food insecurity in the academic community and factors that can contribute to food insecurity in specific segments of the university population, such as undergraduate and graduate students with greater social vulnerability, also considering the pos pandemic scenario. Furthermore, the university under study demonstrated itself as an entity with a recognized role in conveying quality information and actions during the pandemic, as demonstrated by Salvador et al. (2020). Thus, the academic environment can also be suitable for developing actions to promote food and nutritional security.

The strengths of this study were to investigate the presence of food insecurity encompassing the academic community more broadly: undergraduates, graduate students, technical-administrative, and professors, at the time of the COVID pandemic. -19 and using a validated scale. In addition, the results can contribute to the design of better public policy strategies for this population.

New approaches to address food insecurity among mainly university students are needed, as strategies used before the pandemic context, such as meals in university restaurants, may have limited value with the need for social distancing and the use of remote learning. Policies to address food insecurity among university students should also be explored. Future studies on changes in food security status should be carried out to monitor advances in guaranteeing the human right to food, as well as explore strategies to address food insecurity in the academic community.

5 CONCLUSION

This study adds to emerging research on the impacts of COVID-19 on the academic community and the presence of food insecurity. The data from this study showed a large presence of food insecurity in the population studied, especially undergraduate and graduate students. The increase or decrease in income and weight during the pandemic was also associated with increased chances of food insecurity. The results help to understand the characteristics associated with food insecurity, which can be useful in planning strategies to support food security in the academic community.

Future studies should include programs to promote food security, nutritional education, and access to healthy food in the population studied. Policies should also address university restaurants' maintenance and strengthening of services during pandemic situations to ensure the academic community's continued access to quality/safe food.

6 REFERENCES

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