

Unprocessed/minimally processed foods daily intake reduced anxiety symptoms in a Brazilian academic community during the period of social isolation during Covid-19 pandemic

Consumo diário de alimentos in natura/minimamente processado reduziu os sintomas de ansiedade em uma comunidade acadêmica brasileira durante o período de isolamento social da pandemia de Covid-19

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ABSTRACT

Introduction: Social isolation affected the mental health of the population in an extensive way and led to changes in eating habits, causing people to reduce their consumption of healthy foods and increase their intake of unhealthy foods. **Objective:** To evaluate the association between the consumption of unprocessed/minimally processed foods and anxiety symptoms among members of a Brazilian academic community. **Methods:** A cross-sectional study was conducted involving individuals of a Brazilian public university, by way of online. The academic community was composed of university students, professors, and administrative technicians in education. Only subjects aged 18 or above were included. Unprocessed/minimally processed foods were evaluated through a questionnaire, based on Dietary Guidelines for the Brazilian population that evaluated the type of processing used in food production to which each food item. Anxiety symptoms were assessed using the State-Trait Anxiety Inventory for a general population. The following variables were included as covariates: age, sex, physical activity, smoking, alcohol consumption, academic role, and Body Mass Index (BMI). Descriptive analyses were performed to characterize the population, and linear regression models were evaluated to verify the association between unprocessed/minimally processed foods and anxiety symptom scores. **Results:** A total of 195 subjects filled out the online questionnaire. The means (standard deviations) were as follows: anxiety symptoms 49.57 (8.55); age 28.46 (10.40) years; unprocessed/minimally processed foods daily consumption 0.87 (0.24) times a day; and BMI 25.44 (5.49) Kg/m². Most of the academic community was female (72.68%), did not practice physical activity (59.79%), did not smoke (91.75%), consumed alcohol (51.55%), and were students (71.13%). In the multivariate linear regression, after adjusting for potential confounders variables, higher daily consumption of unprocessed/ minimally processed foods was associated with lower anxiety symptoms during social isolation due to Coronavirus Disease 2019 ($\beta = -6.69$; 95% Confidence Interval = -11.73 ; -1.66 ; p -value = 0.009). **Conclusion:** The consumption

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of unprocessed/minimally processed foods reduced anxiety symptoms in individuals of the academic community at the university studied.

Keywords: Anxiety, Eating, Universities, Social isolation, COVID-19.

RESUMO

Introdução: O isolamento social afetou a saúde mental da população de forma ampla e promoveu uma tendência na mudança nos hábitos alimentares, com a redução de alimentos saudáveis e aumento de alimentos não saudáveis. **Objetivo:** Avaliar a associação entre o consumo de alimentos in natura ou minimamente processados e sintomas de ansiedade em uma comunidade acadêmica brasileira. **Métodos:** Um estudo transversal foi realizado com indivíduos de uma universidade pública brasileira, por meio on-line. A comunidade acadêmica era composta por estudantes, professores e técnicos administrativos em educação, e somente foram incluídos indivíduos com idade igual ou superior a 18 anos. Os alimentos in natura ou minimamente processados foram avaliados através de um questionário de acordo com o grau e a natureza do processamento de alimentos no Guia de Alimentar para a população brasileira. Os sintomas de ansiedade foram avaliados utilizando o Inventário de Ansiedade Traço-Estado para uma população em geral. Variáveis selecionadas foram incluídas como covariáveis: idade, sexo, atividade física, tabagismo, consumo de álcool, função acadêmica e o Índice de Massa Corporal. Análises descritivas foram realizadas para caracterizar a população. Os modelos de regressão linear foram avaliados para verificar a associação entre a ingestão diária de alimentos in natura ou minimamente processados e a pontuação de sintomas de ansiedade. **Resultados:** Um total de 195 indivíduos responderam ao questionário on-line. A média (DP) de sintomas de ansiedade foi de 49,57 (8,55), a idade foi de 28,46 (10,40) anos, o consumo diário de alimentos in natura ou minimamente processados foi de 0,87 (0,24) vezes por dia, e o IMC 25,44 (5,49) Kg/m². A maioria da comunidade acadêmica era do sexo feminino (72,68%), não praticava atividade física (59,79%), não fumava (91,75%), consome álcool (51,55%) e era estudante (71,13%). Na regressão linear multivariada, após ajuste para potenciais variáveis de confusão, o maior consumo diário de alimentos in natura ou minimamente processados estava associado a menores índices de sintomas de ansiedade durante o isolamento social da COVID-19 ($\beta = -6,69$; 95% Intervalo de confiança = -11,73; -1,66, p-valor = 0,009). **Conclusão:** O consumo de alimentos in natura ou minimamente processados reduziram os sintomas de ansiedade em indivíduos da comunidade acadêmica da universidade estudada.

Palavras chave: Ansiedade, Ingestão de alimentos, Universidades, Isolamento social, COVID-19.

INTRODUCTION

The pandemic caused by Coronavirus Disease 2019 (COVID-19) brought uncertainties and changes in behavior and lifestyle because of social distancing and isolation, having a profound impact on the mental health of the general population¹ and on their eating habits^{2,3}. Individuals with a confirmed diagnosis of COVID-19 and/or death of a loved one had the worst mental health outcomes⁴. Regarding eating habits, a trend was observed towards lower consumption of healthy foods (unprocessed/minimally or processed foods) and higher consumption of unhealthy foods (ultra-processed foods)^{2,3}.

Social isolation, although a necessary measure to control the COVID-19 pandemic, affected the mental health of the population in a broad, substantial, and long-lasting manner⁵. In a meta-analysis, the authors found that the main mental health symptoms experienced during the pandemic were depression, mood disorder, anxiety, and nonspecific general mental health symptoms¹. In Brazil, symptoms of depression, anxiety, and stress have been identified as causes of Brazilian mental health problems during the pandemic^{6,7}.

The academic community of higher education institutions (HEIs), which includes professors, students, and administrative

technicians in education, was one of the groups that presented problems with mental health^{8,9}. This was due to the fact that all HEI activities were suspended indefinitely, and when classes returned, they were in remote teaching format^{7,10}.

Studies show that diet, physical activity, and lifestyle adaptations affect mental health and that the restrictions imposed by the COVID-19 pandemic influenced people's eating habits¹¹⁻¹³. This change was mainly due to limited access to food because of restricted opening times of supermarkets and stores, new work routines, and remote learning¹⁴. All these factors led to psychological stress and boredom during the period of isolation, which was associated with eating more and increased cravings for ultra-processed foods¹⁴.

Foods can be classified according to the extent of industrial processing to which they are subjected and its implications on health, eating patterns, and the risk of disease¹⁵. The NOVA classification is a tool that divides foods into four main categories: unprocessed and minimally processed foods; culinary ingredients; processed foods (which may be unprocessed/minimally processed foods, but modified by the addition of salt, sugar, fats, and oils); and ultra-processed foods¹⁶.

In recent years, the consumption of ultra-processed foods has raised concerns about their impact on health. These foods are produced from substances extracted or refined from whole foods and subjected to industrial or chemical processing. They are rich in additives, such as color stabilizers and flavor enhancers, which are used to make them look like fresh foods or improve their sensory characteristics and without sugar and sweeteners^{10,16,17}.

Considering that the academic community was exposed to social isolation, which led to changes in social behavior and harmful effects on mental health, the need to adapt healthy eating habits was seen. Anxiety and other mental disorders are

common disorders of the 21st century^{11-13,18}, and throughout this period of social isolation, food consumption has also changed. Studies are needed to reveal the possible associations between the consumption of foods with different degrees of processing and the occurrence of mental health-related comorbidities. In view of the scenario created by the pandemic, investigating populations, particularly the academic population, could contribute to the implementation of institutional policies on healthy eating and reduction of mental health disorders regardless of the health crises. The present study is justified by the absence of studies involving university professors and administrative technicians in education. Furthermore, it is important to emphasize that lately, there has been a change in eating habits, with fresh foods being replaced by ultra-processed foods. The pandemic may have acted as a catalyst to this change, exacerbating the trend¹¹⁻¹³. Thus, this study aimed to evaluate the association between the consumption of unprocessed/minimally processed foods and anxiety symptoms in a Brazilian academic community.

METHODS

Study design and population

This was a cross-sectional study with a convenient sample of individuals from Federal University of Jataí (UFJ, Portuguese Brazilian acronym), a Brazilian public university located in the Jataí, state of Goiás, in the Mid-West region of Brazil. All academic communities, aged 18 and above, were invited to respond to an online questionnaire during the months of May and June 2020. The academic community was composed of students, professors, and administrative technicians in education. Due to the increase in the number of cases of COVID-19, the period of social academic isolation extended from March 2020 to January 2022, with an exception for health-related activities¹⁹.

Assessment of food consumption

Food consumption was assessed through a questionnaire, based on the degree and nature of food processing cited in Dietary Guidelines for the Brazilian population¹⁶. Examples of foods were listed and classified as: i. unprocessed/minimally processed foods; ii. oils, fats, salt, and sugar; iii. processed foods; and iv. ultra-processed foods. The participants were asked how often they consumed each type of food. The present study included only unprocessed/minimally processed foods in analysis.

To estimate the frequency of consumption of unprocessed/minimally processed foods, the respondents were asked about their consumption of fresh or packaged chopped, chilled, or frozen vegetables, fruits, and tubers; rice; corn in grains or on the cob; wheat and other cereal grains; beans, lentils, chickpeas, and other legumes; fresh or dried mushrooms; dried fruits, fruit juices, and pasteurized fruit juices with no added sugar or other substances; walnuts, peanuts, and other oilseeds without added salt or sugar; cassava, corn, or wheat flours and fresh or dry pasta or pasta made with these flours and water; beef, pork and poultry, and fresh, chilled, or frozen fish; pasteurized, ultra-pasteurized, or powdered milk, yogurt without any added sugar; eggs; and tea, coffee, and drinking water. The participants were asked to state, on the questionnaire, how often they consumed each of these food items. The frequency options were adapted from Chronic Disease Risk and Protective Factors Telephone Survey Surveillance System, 2019²⁰ and transformed into daily frequencies, as follows: every day = 1, 5–6 times a week = 0.79, 2–4 times a week = 0.43, 1 time a week = 0.14, 1–3 times a month = 0.07, and never or almost never = 0.

Anxiety symptoms

Anxiety symptoms were assessed using the State–Trait Anxiety Inventory (STAI) for a general population. A translated version, adapted and validated for Brazil, was used for this study²¹.

STAI has 20 items with four response options: almost never, sometimes, often, and almost always. These responses range from one (least anxious) to four (very anxious), depending on the level of anxiety²². The instrument gives a score ranging from 20 to 80. Anxiety symptoms were related to the period of social isolation due to the COVID-19 pandemic.

Covariates

A structured questionnaire was used to obtain the following variables: age (years), sex (female/male), physical activity (yes/no), smoking (yes/no), alcohol consumption (yes/no), and academic role (student/ professor/ administrative technician in education).

Weight and height were reported by the participants, and the Body Mass Index (BMI) was calculated from weight in kilograms / height in meters².

Statistical analysis

The characteristics of the academic community were described as mean (standard deviation [SD]) for continuous variables and as frequency for categorical variables. The characteristics of the academic community were also described using BMI tertiles and analysis of variance. The Tukey–Kramer method was used to verify the differences between continuous variables, and the chi-square test was used for the categorical variables.

Pearson's correlation was performed between the following selected variables: daily intake of unprocessed/minimally

processed foods, anxiety symptoms score, age, and BMI.

Unadjusted and adjusted linear regression models were performed to verify the association between the daily intake of unprocessed/minimally processed foods and the anxiety symptoms score. Variables which presented a p-value lower than 0.2 in an unadjusted linear regression model were included in the adjusted model.

The analyses were performed using the statistical software package STATA v14.1 (STATA Corp) and GraphPad Prism 6.0, with a minimum significance index of $p < 0.05$.

Ethical statement

This study was approved by the UFJ Research Ethics Committee (reference no. 30709020.8.0000.8155). Online informed consent was obtained from each participant included in the study, and confidentiality of the data was guaranteed.

RESULTS

A total of 195 individuals responded to the online questionnaire, but one was excluded as the respondent was younger than 18-years-old. Three participants did not respond to the weight question. The anxiety symptoms mean (SD) were 49.57 (8.55); age 28.46 (10.40) years; unprocessed/minimally processed foods daily consumption 0.87 (0.24) times a day; and BMI 25.44 (5.49) Kg/m². Most of the academic community was female (72.68%), did not practice physical activity (59.79%), did not smoke (91.75%), consumed alcohol (51.55%), and were students (71.13%) (Table 1).

Participants in the highest BMI tertiles had a lower intake of unprocessed/minimally processed foods [1st 0.88 (0.21) vs. 2nd 0.92 (0.21) vs. 3rd 0.80 (0.29); p-value 0.027], were older [1st 24.89 (7.96) vs. 2nd 24.89 (7.96) vs. 3rd 31.75 (10.51); p-value 0.001], performed less physical activity (1st 33.87% vs. 2nd 55.38% vs. 3rd 31.25%; p-value 0.009), and had a lower prevalence of nonsmokers (1st 95.16% vs. 2nd 95.38% vs. 3rd 84.38%) (Table 2).

Table 1. Academic community characteristics (n=194) of a public Brazilian University in Jataí - Goiás, Brazil, 2020

Characteristic	Values
Continuous variables	Mean (SD^a)
Anxiety symptoms score ^b	49.57 (8.55)
Unprocessed or minimally processed foods daily intake	0.87 (0.24)
BMI ^c	25.44 (5.49)
Age (years)	28.46 (10.40)
Categorical variables	n (%)
Physical activity	
Yes	78 (40.21)
No	116 (59.79)
Sex	
Female	141 (72.68)
Male	53 (27.32)
Smoking	
Yes	16 (8.25)
No	178 (91.75)
Alcohol consumption	
Yes	94 (48.45)
No	100 (51.55)
Academic function	
Student	138 (71.13)
Professor	46 (23.71)
Administrative technician in education	10 (5.15)

^aStandard Deviation; ^bBased on State-Trait Anxiety Inventory; ^cBody Mass Index

Table 2. Academic community characteristics (n=194) stratified by Body Mass Index (BMI) tertiles of a public Brazilian University in Jataí - Goiás, Brazil, 2020

Characteristic	1 st BMI tertile	2 nd BMI tertile	3 rd BMI tertile	
Continuous variables	Mean (SD)	Mean (SD)	Mean (SD)	p-value ^a
Anxiety symptoms score ^b	48.63 (7.49) [†]	49.02 (7.71) [†]	50.94 (10.25) [†]	0.264
Unprocessed or minimally processed foods daily intake	0.88 (0.21) [†]	0.92 (0.21) ^{†‡}	0.80 (0.29) ^{†§}	0.027
BMI	20.07 (1.37) [†]	24.45 (1.38) [‡]	31.64 (4.32) [§]	<0.001
Age (years)	24.89 (7.96) [†]	24.89 (7.96) ^{†‡}	31.75 (10.51) [‡]	0.001
Categorical variables	n (%)	n (%)	n (%)	p-value ^c
Physical activity				0.009
Yes	21 (33.87) [†]	36 (55.38) [§]	20 (31.25) [†]	
No	41 (66.13) [†]	29 (44.62) [§]	44 (68.75) [†]	
Sex				0.045
Female	52 (83.87) [†]	43 (66.15) [§]	43 (67.19) [§]	
Male	10 (16.13) [†]	22 (33.85) [§]	21 (32.81) [§]	
Smoking				0.037
Yes	3 (4.84) [†]	3 (4.62) [†]	10 (15.63) [§]	
No	59 (95.16) [†]	62 (95.38) [†]	54 (84.38) [§]	
Alcohol consumption				0.159
Yes	26 (41.94) [†]	29 (44.62) [†]	37 (57.81) [†]	
No	36 (58.06) [†]	36 (55.38) [†]	27 (42.19) [†]	
Academic function				0.091
Student	51 (82.26) [†]	43 (66.15) [†]	41 (64.06) [†]	
Professor	8 (12.90) [†]	20 (30.77) [†]	18 (28.13) [†]	
Administrative technician in education	3 (4.84) [†]	2 (3.08) [†]	5 (7.81) [†]	

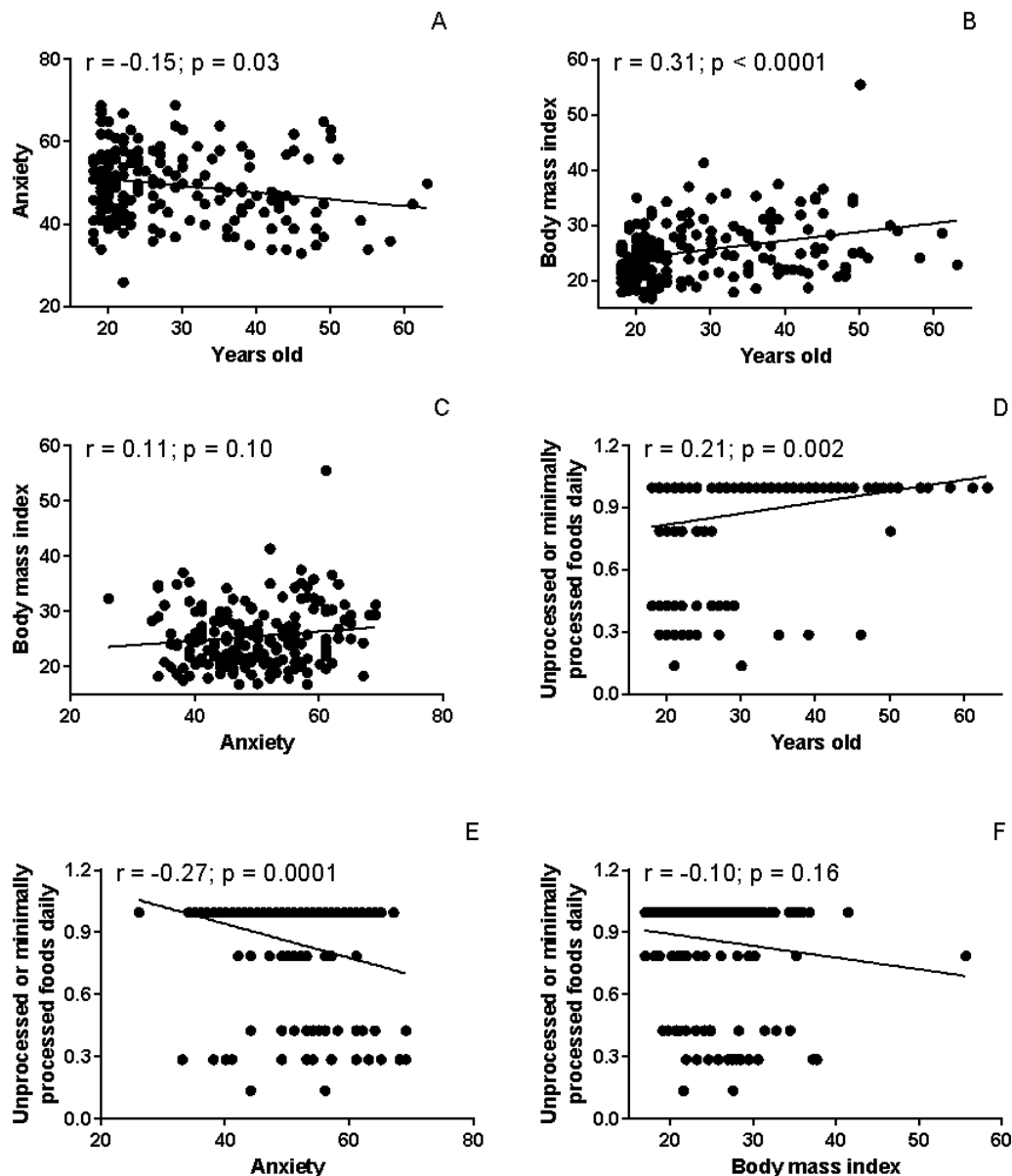
^aP value refers to ANOVA test. † ‡ § Where superscripts differ there is a difference between BMI tertile p < 0.05 (Tukey–Kramer method test)

^bBased on State-Trait Anxiety Inventory

^cP-values refer to Chi-square test

Figure 1 shows correlations between the variables anxiety, age, BMI, and consumption of unprocessed/minimally processed foods. A negative correlation was observed between anxiety and the age of the participants ($r = -0.15$, $p = 0.03$; Figure 1A). A positive correlation was observed between BMI and age ($r = 0.31$, $p < 0.0001$, Figure 1B), but no correlation was observed between BMI and anxiety ($r = 0.11$, $p = 0.10$, Figure 1C). For the consumption of unprocessed/

minimally processed foods, a positive correlation was observed with age ($r = 0.21$, $p = 0.002$, Figure 1D), and a negative correlation was observed between the consumption of unprocessed/minimally processed foods and anxiety ($r = -0.27$, $p = 0.0001$, Figure 1E). No correlation was observed between the consumption of these foods and BMI ($r = -0.10$, $p = 0.16$, Figure 1F).

Figure 1. Correlation between selected variables of a public Brazilian University in Jataí - Goiás, Brazil, 2020.

*Pearson's r test was used to verify the correlations. $p < 0.05$.

The variables included in the unadjusted linear regression model were BMI, age, physical activity, sex, smoking, alcohol consumption, and academic function. In the bivariate linear regression, we found that the lower consumption of unprocessed/minimally processed foods ($\beta = -9.55$; 95% Confidence Interval [CI] = -14.39 ; -4.71 ; $p < 0.001$), younger age ($\beta = -0.16$; 95%CI = -0.28 ; -0.05 ; $p\text{-value} = 0.005$), smoker ($\beta = -5.71$; 95%CI = -10.05 ; -1.38 ; $p\text{-value} = 0.010$), and being a student

as opposed to professors ($\beta = -4.27$; 95%CI = -7.08 ; -1.45 ; $p\text{-value} = 0.003$) were associated with higher scores for anxiety symptoms. In the multivariate linear regression, after adjusting for potential confounders, it was observed that higher daily consumption of unprocessed/minimally processed foods was associated with lower scores of anxiety symptoms during the period of social isolation due to COVID-19 ($\beta = -6.69$; 95%CI = -11.73 ; -1.66 ; $p\text{-value} = 0.009$) (Table 3).

Table 3. Unadjusted and adjusted models of linear regression between unprocessed or minimally processed foods daily intake and anxiety symptoms score of a public Brazilian University in Jataí - Goiás, Brazil, 2020

Variables	Anxiety symptoms score					
	Unadjusted model			Adjusted models		
	β	95% CI	<i>p</i> -value	β	95% CI	<i>p</i> -value
Unprocessed or minimally processed foods daily intake	-9.55	-14.39; -4.71	<0.001	-6.69	-11.73; -1.66	0.009
BMI (kg/m ²)	0.20	-0.02; 0.42	0.077	0.17	-0.06; 0.41	0.139
Age (years)	-0.16	-0.28; -0.05	0.005	0.05	-0.24; 0.14	0.575
Physical activity (yes/no)	2.17	-0.28; 4.62	0.083	1.26	-1.17; 3.70	0.308
Sex (female/ male)	-2.21	-4.91; 0.49	0.109	-1.38	-4.10; 1.32	0.315
Smoking (yes/no)	-5.71	-10.05; -1.38	0.010	-3.53	-8.05; 0.97	0.124
Alcohol consumption (yes/no)	-2.90	-5.30; -0.51	0.018	-1.80	-4.21; 0.61	0.143
Academic function						
Student	ref	ref	ref	ref	ref	ref
Professor	-4.27	-7.08; -1.45	0.003	-2.07	-26.43; 2.27	0.348
Administrative technician in education	-2.82	-8.24; 2.59	0.305	-0.82	-6.54; 4.91	0.778

DISCUSSION

This study found that the consumption of unprocessed/minimally processed foods was associated with a reduction in anxiety symptoms among individuals from the UFJ academic community. Furthermore, it was observed that individuals with higher BMI have less healthy eating habits and a more sedentary lifestyle and were more likely to smoke. This data was collected during the initial period of the pandemic; however, this study is important because of the lack of studies involving the entire academic community, as previous studies have focused on either students or professors.

The COVID-19 pandemic has significantly impacted human health^{4-8,23}. Social isolation, recommendations from health bodies to stay at home, and the uncertainty of the future were some of the factors that led to an increase in anxiety symptoms in the adult population at a global level^{4,6,7,9,23}. A systematic review, carried out in 2020, on mental health during the pandemic showed a high range in the estimates of anxiety symptoms in the adult population in different countries, ranging from 6.33% to 50.9%, and reported that females are generally more likely to develop depressive and anxiety symptoms when compared to male²⁴. Another systematic review, involving more than 9,000 professors, observed a variation of 10% to 49.4% in the prevalence of anxiety²⁵ for the same period of the pandemic. In this study, the younger population had a higher rate of occurrence of anxiety when compared to the professors and administrative technicians in education. This greater vulnerability of young people was also observed in a survey with 1,653 adults distributed across 63 countries, using the same tool to classify anxiety²⁶.

The Centers for Disease Control and Prevention in the United States revealed that during the COVID-19 pandemic, around 40% of the general population experienced one or more adverse behavioral and mental health symptoms, while around half of the

young population aged between 18 and 24 years presented anxiety symptoms²³. The academic community, especially professors were also included in this increased percentage of people experiencing anxiety symptoms during the pandemic. In a study of 1,633 university professors in Spain, the authors observed that more than 49% of the participants had anxiety symptoms²⁷. In this study, the mean scores of anxiety symptoms, measured by the STAI scale, was moderate to high, but was like other studies with adults in other locations. In a study conducted by Cai and collaborators²⁸ in Japan, the authors found that scores of anxiety symptoms varied between 56.68 in men and 60.47 in women. A study conducted in Taiwan found a score average of 48.8 in the population during the pandemic²⁹. In a study carried out in Portugal, the scores average anxiety symptoms varied between 41.51 in men and 46.62 in women³⁰.

Romeo and collaborators³¹ observed that college students are predisposed to a higher risk of developing mental health symptoms because of the COVID-19 pandemic when compared to workers in general. A cross-sectional study carried out with university students before the pandemic analyzed the prevalence of depression, anxiety, and stress in this population and concluded that 23.6% of the respondents suffered from anxiety. Worldwide, it is estimated that between 12% and 50% of university students present at least one criterion for the diagnosis of mental disorders³². When compared to this study, an increase in the anxiety symptoms is observed after the start of the pandemic. As a result of the mandatory social isolation after the COVID-19 epidemic, students faced uncertainty over their academic careers³³. Hopelessness, fear of death, and frustration were some of the feelings reported by students during the lockdown period in addition to stress, anxiety, boredom, loneliness, and other emotions that have had an impact on the lives of young people, impairing sleep, eating habits,

and potentially increasing certain addictions³⁴.

Epidemiological studies suggest that higher consumption of unprocessed/minimally processed foods is inversely related to the risk of developing mental disorders such as depression and anxiety^{12,13,35}. A possible explanation for this protective effect of unprocessed/minimally processed foods is the presence of polyphenols, nonessential micronutrients found in various fruits, natural fruit juices, and vegetables that can improve brain functioning through the modulation of neurotransmitters, which in turn reduces anxiety symptoms³⁶. The presence of other components in fresh foods, such as complex carbohydrates, fiber, vitamin C and B complex, and carotenoids in addition to minerals such as potassium, are also known to improve mental health. These components of fresh foods, when combined with polyphenols, are known to be the best at reducing anxiety³⁷.

A study carried out in Brazil with 1,693 adults observed that individuals with depressive symptoms had a lower daily consumption of some minimally processed foods and that individuals with anxiety had a lower consumption of fruits¹³. This result was similar to that found in the present study (a positive relationship between the consumption of unprocessed/minimally processed foods and less symptoms of anxiety).

The consumption of unprocessed/minimally processed foods can favor weight control. This study revealed that participants with a higher BMI had a lower intake of unprocessed/minimally processed foods. In a large prospective cohort study of French adults, the authors found that consumption of ultra-processed foods was associated with higher BMI and increased risk of being overweight and obese³⁸. In Poland, high BMI was found to be associated with less frequent consumption of vegetables, fruits, and pulses during the lockdown period and higher consumption of

meat, dairy products, and fast foods³⁹.

Alcohol consumption and physical activity were lifestyle habits that underwent many changes during the pandemic and had a direct association to mental health. In the present study, higher consumption of alcoholic beverages and a reduction in physical activity were observed, like other studies^{2,39,41}. The increase in alcohol beverage consumption during the pandemic was associated with poorer mental health, and those who usually drink alcohol did not increase their consumption and had no changes in their mental health^{39,42}. On the other hand, to practice healthy habits, are related to dietary choices, physical activity practice, no smoking, and no alcoholic beverages consumption, can result in healthy choices and consequently better mental health^{2,13,41}. During quarantine, most people stayed at home with often unlimited access to food and physical activity practice, however who exercise at home, usually prepare their own meal and chose better food, characterized as unprocessed/minimally processed foods⁴³.

As strengths of this study, we highlight the use of a validated instrument to assess anxiety symptoms and the practicality and ease of answering the online questionnaire. However, the fact that the questionnaire was self-completed may have resulted in misinterpretations of the questions or incorrect completion and may be a limitation of the study. Moreover, we did not use a validated questionnaire to assess dietary intake, which could have underreported food intake. Other limitation observed in the present study was the high prevalence of women in the sample, however it is observed in studies with similar design^{7,9,23,24,27,39,40} and this variable was included in the adjusted model regression.

CONCLUSION

This present study observed that during the COVID-19 pandemic, eating habits influenced the anxiety symptoms of

individuals in the academic community of the university studied. The consumption of unprocessed/minimally processed foods reduced anxiety symptoms. Another relevant point found in the study was the relationship between the highest BMI tertiles and poorer eating habits and lifestyle, as lower physical activity practice and higher smoking.

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Author Indications

AAFV: Substantial contribution to the design of the study or the interpretation of the data; Participation in writing the preliminary version; Participation in the review and approval of the final version; Compliance with being responsible for the accuracy or completeness of any part of the study.

CDAS: Participation in writing the preliminary version; Participation in the review and approval of the final version.

RMFC: Participation in writing the preliminary version; Participation in the review and approval of the final version.

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