



Racial Differences in Generalized Anxiety Disorder During the COVID-19 Pandemic among Brazilian University Students: a National Survey

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Abstract

There is evidence that during the COVID-19 pandemic, there was an increase in anxiety and depression rates among college students. However, little is known about how generalized anxiety disorder (GAD) developed among individuals of different race/skin color. This study aimed to determine whether there are racial differences in GAD in Brazilian university students during the COVID-19 pandemic. This is a nationwide cross-sectional study, carried out through the application of online questionnaires to university students from 94 Brazilian universities. Self-reported data on age, sex, economic class, race/skin color, anthropometric data, and adherence to social distancing measures were collected. To determine the GAD, the Generalized Anxiety Disorder 7-item scale was applied. A total of 5879 participants were included, with a mean age of 24.1 ± 6.4 years, and the majority were female ($n = 4324$, 73.5%), most self-declared to be whites ($n = 2945$, 50.1%), followed by browns ($n = 2185$, 37.2%) and blacks ($n = 749$, 12.7%). The prevalence of GAD among black Brazilian university students (47.3% [95% CI 43.7, 50.8]) was significantly higher than that of browns (38.6% [95% CI 36.6, 40.7]) and whites (44.1% [95% CI 42.3, 45.9]), even after multivariable adjustment by other sociodemographic factors. The findings of the present study suggest a possible racial difference in GAD among Brazilian university students, in which those who declared their race/skin color as black showed a greater risk for GAD than those who declared themselves as white or brown.

Keywords Race · Ethnicity · GAD-7 · Mental health · SARS-CoV-2

Introduction

The World Health Organization (WHO) declared, on March 11, 2020, the pandemic of the disease caused by the infection with the new coronavirus (COVID-19) [1]. Due to its rapid spread and important impact on population morbidity and mortality, measures to contain the spread of the SARS-CoV-2 virus have been implemented worldwide. Among these measures, quarantine, social distancing, and social isolation resulted in the closure of commerce, public outdoor spaces (i.e., squares, parks, and beaches), schools, and universities [2, 3].

The impacts of the COVID-19 pandemic and measures of social distancing on the health of the population in different stages of the life cycle have already been reported, in both adolescents and adults [4–7]. University students are known as a vulnerable public for mental health problems [8], and the effects of the pandemic were also observed in this population, among which the high rates of anxiety and depression are associated with concerns regarding their health, academic performance, and decreasing family income [4, 6, 9, 10].

In Brazil, few studies have evaluated the relationship between race/skin color and the mental health of the population. Although there is no formal policy of racial segregation in Brazil, the country has important inequalities related to the race/skin color of individuals, whether in educational, financial, or social opportunities [11–15]. The paths that link race/skin color and mental health involve stress associated with the economic class, social roles, social structure, racism, and discrimination [16]. Therefore, given the influence of race/skin color and the consequences of the COVID-19 pandemic on the mental health of university students, this study aimed to

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determine whether there are racial differences in generalized anxiety disorder (GAD) in Brazilian university students during the COVID-19 pandemic.

Methods

Ethical Aspects

The research protocol was approved by the Research Ethics Committee of the Universidade Federal de Alagoas (opinion number: 4,410,403). All participants were presented with the free and informed consent form (FICF). After accessing the survey link, the participants were introduced to the FICF that was on the first page of the virtual questionnaire, and it was necessary to accept it to access the questionnaire and start data collection.

Study Design

This is a cross-sectional study.

Location and Sample

This study is a secondary analysis of the project entitled “Prevalence of food addiction in university students during the COVID-19 pandemic,” conducted among Brazilian university students, from 94 public and private universities, from all 27 federative units (26 states and the Federal District [federal capital]) of Brazil. Administratively, the country is divided into 27 federative units that make up its five macro-regions: North, Northeast, Midwest, Southeast, and South [17]. Data collection took place by completing an online questionnaire between October 27 and December 11 (between the 44th and the 50th epidemiological week) of 2020. During the year 2020, Brazil was between two peaks of cases and deaths, in which in the 30th epidemiological week, the country presented 319,653 and 7677 absolute numbers of cases and deaths, respectively, and during the 51st epidemiological week of 2020 with absolute numbers of 333,028 new cases and 5233 deaths [18].

Undergraduate students from any area of knowledge, of both sexes, aged between 18 and 59 years were included. Subjects submitted to bariatric surgery, pregnant women, and lactating women were not included. Participants who sent incomplete questionnaires, who reported unlikely values for anthropometric variables (weight or height), or those who chose not to report race/skin color were excluded from the analysis. The recruitment of participants took place through invitations sent by e-mails and publications on websites and institutional social networks.

Demographic and Clinical Variables

Data on age (in years), date of birth, sex, educational institution that was linked, federative unit, race/skin color, and whether they had a medical diagnosis of depression were collected. We adopted the method proposed by the Instituto Brasileiro de Geografia e Estatística (IBGE) to collect race/skin color data, in which the individual should self-report his identification as white (Caucasian), black (Afro-descendant), brown, yellow (Asian), and indigenous [17]. In Brazil, the term “browns” is used to refer to people with mixed race/skin colors.

Economic Class

The Critério de Classificação Econômica Brasil was used to determine the economic class of the participants. This instrument consists of questions about property ownership, the presence of monthly domestic employees, and the number of bathrooms in the home. Also considered is the level of education of the head of the family and access to public services such as piped water and paved street. A value is assigned to each answer, and a sum of the scores is made for each individual, which can vary from 0 to 100 points, the highest scores correspond to a higher estimated monthly family income. Individuals were classified into six economic classes: “A” (45–100 points), “B1” (38–44 points), “B2” (29–37 points), “C1” (23–28 points), “C2” (17–22 points), “D–E” (0–16 points) [19].

Adherence to Social Distancing and Medical Diagnosis of COVID-19

Adherence to the social distancing measures was also self-reported and collected through the following question “Did you follow the social distancing measures?” The participants could answer “I followed the social distancing most of the time, performing only trips to supermarkets and pharmacies,” “I followed the social distancing, but I had to leave to work,” or “I didn’t follow the social distancing”.

The medical diagnosis of COVID-19 was self-reported and collected through a direct question “Did you have a medical diagnosis of COVID-19?” with dichotomous response (yes or no). Medical tests or certificates were not collected to confirm the information provided.

Anthropometry

Height (in meters) and body weight (in kilograms) data were self-reported. The body mass index (BMI) was calculated and classified as underweight (BMI < 18.5 kg/m²), normal weight (BMI between 18.5 and 24.9 kg/m²), overweight (BMI between 25.0 and 29.9 kg/m²), and obese (BMI ≥ 30 kg/m²),

according to the cutoff points proposed by the World Health Organization [20].

Generalized Anxiety Disorder

The Generalized Anxiety Disorder 7-items scale (GAD-7) was developed to identify GAD [21]. GAD-7 also demonstrated good sensitivity and specificity as a tool for screening for panic, social anxiety, and post-traumatic stress disorder [22]. This tool was translated into Portuguese by Pfizer (Copyright © 2005 Pfizer Inc., New York, NY) and has a record of evidence of validity in Brazil [23]. It consists of seven items, arranged on a Likert scale with four points ranging from 0 to 3, where 0 represents “not at all” and 3 “nearly every day”; the score is added and can vary from 0 to 21 points. It was considered a probable case of GAD, scores equal to or greater than 10 [21]. Cronbach’s α for this sample was 0.90.

Statistical Analysis

In the descriptive analysis, data are presented as mean and standard deviation for continuous variables and frequencies for categorical variables. Poisson regression with robust adjustment of variances was used to identify the factors associated with GAD (dependent variable), in univariable analyses and in multivariable models that included age (in years), sex, race/skin color, economic class, depression diagnosis, COVID-19 diagnosis, BMI classification, and adherence to social distancing measures during the COVID-19 pandemic, as independent variables. Prevalence ratios (PR) and their respective 95% confidence intervals (95% CI) are presented. We adopted α equal to 5% for all analyses. All statistical analyses were conducted using the software R v 3.6.1 (R Foundation for Statistical Computing, Vienna, Austria).

Results

In all, 6532 questionnaires were sent to the online platform; however, after cleaning the database, 548 were excluded; Fig. 1 shows the flowchart of the participants. In addition, we excluded from this analysis individuals who declared themselves yellow ($n = 72$) and indigenous ($n = 33$), due to the small sample size, totalling 653 excluded individuals. Thus, 5879 participants were included in this analysis.

The mean age of the sample was 24.1 ± 6.4 years; the majority were female ($n = 4324$, 73.5%) and lived in the Northeast ($n = 2589$, 44.0%). The vast majority were from economic class B2 ($n = 1773$, 30.2%) and C1 ($n = 1210$, 20.6%) and were of adequate weight (3263, 55.5%) according to the BMI, and 849 (14.4%) reported having the medical diagnosis of depression. Regarding race/skin color, most self-declared to be whites ($n = 2945$, 50.1%), followed by

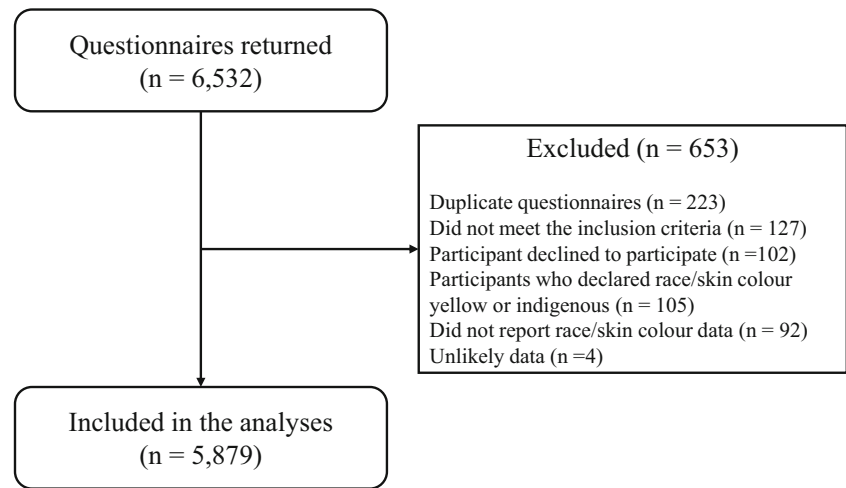
browns ($n = 2185$, 37.2%) and blacks ($n = 749$, 12.7%). Table 1 describes the characteristics of the included sample. The prevalence of GAD was 44.1% (95% CI 42.3, 45.9) among whites, 47.3% (95% CI 43.7, 50.8) among blacks, and 38.6% (95% CI 36.6, 40.7) among browns. In the present sample, the average score on the GAD-7 was 9.7 ± 5.5 points.

Univariable and multivariable analyses between demographic, social, economic, clinical, and GAD indicative variables are shown in Table 2. After adjustment, the association between GAD and age (in years) (PR 0.98; 95% CI 0.97, 0.98; $p < 0.01$) and the female gender (PR 1.32; 95% CI 1.22, 1.43; $p < 0.01$) remained significant. An association was observed between GAD and race/skin color in general (omnibus test $p < 0.01$). Specifically, the association with black race/skin color (PR 1.10; 95% CI 1.01, 1.20; $p = 0.02$) and brown (PR 0.92; 95% CI 0.86, 0.98; $p = 0.01$), using the race/skin color “white” as the reference category, was significant. An association was also observed with the BMI classes (omnibus test $p < 0.01$), with overweight (PR 1.15; 95% CI 1.07, 1.24; $p < 0.01$) and obesity (PR 1.29; 95% CI 1.19, 1.40; $p < 0.01$), while using the normal weight as the reference. The medical diagnosis of depression was associated with GAD (PR 1.78; 95% CI 1.69, 1.89; $p < 0.01$). Regarding adherence to social distancing, an association with GAD was observed (omnibus test $p < 0.01$), partial adherence to measures of social distancing (i.e., leaving home to work) (PR 1.08; 95% CI 1.01, 1.15; $p = 0.01$), with total adherence to social distancing (i.e., leaving home only for going to the supermarket and pharmacy) being the reference category. No association was observed between GAD, COVID-19 diagnosis, and any particular economic class.

Discussion

In this study, we investigated the differences in race/skin color in the GAD in a representative sample of Brazilian university students during the COVID-19 pandemic. Our results indicate that GAD was associated with black/brown skin races/colors, in multivariable analyses. These findings indicate that the prevalence of GAD among black Brazilian university students (47.3% [95% CI 43.7; 50.8]) was higher than that of browns (38.6% [95% CI 36.6, 40.7]) and whites (44.1% [95% CI] 42.3, 45.9), remaining significant in the multivariable analysis, adjusting for several sociodemographic factors. Furthermore, we did not observe an association between GAD and economic class.

High rates of anxiety, depression, psychological distress, and stress have been reported in the general population during the COVID-19 pandemic [24]. University students are, in particular, a vulnerable group for the development of mental health problems, and, therefore, the impacts of the COVID-19 pandemic on the mental health of this group have also been investigated [8]. In this public, higher prevalences of anxiety

Fig. 1 Flowchart of study participants

and depression were observed and were related to the fear of being contaminated or that their family members were contaminated by SARS-CoV-2, economic and academic issues [4, 6, 9, 10].

Racial and ethnic differences were investigated in specific mental health conditions, such as common mental disorder, depression, and, to a lesser extent, anxiety disorders. Concerning anxiety, findings contrary to what was observed in our research were found in a study conducted between March 29 and 31, 2020, in the USA. This study evaluated 1005 participants and observed that respondents who identified themselves as black were less likely to meet the anxiety criteria used in GAD-7 than the participants who identified themselves as white [25]. The pre-pandemic findings are contradictory, where Merikangas et al. [26] observed higher rates of anxiety disorders among black non-Hispanic adolescents when compared to non-Hispanic whites. Asnaani et al. [27] noted that African Americans were less likely to have GAD than white Americans. However, Williams et al. [28] observed a greater chronicity of major depressive disorder and a greater degree of functional impairment in African Americans in the USA.

In our study, individuals who self-report to be brown had the lowest prevalence of GAD among the groups evaluated. We are unaware of studies that have evaluated GAD in this group; however, other mental health conditions have already been investigated. Bastos et al. [29] conducted a study with 424 Brazilian university students and found a lower prevalence of common mental disorders in self-declared brown individuals (32.8%) than self-declared white individuals (37.0%). Another study conducted in Brazil, with women aged between 15 and 45 years and who were between 35 and 180 days after delivery, found that brown women also had a lower prevalence of postnatal depression than white women [30]. It is worth mentioning that in Brazil, the self-attribution of race/skin color is mainly due to physical characteristics such as skin color, the shape of the nose and lips,

and the type of hair, with the physical traits of blacks and browns socially devalued [31]. In addition, there is a strong relationship between race/skin color and socioeconomic status in the country, to the point of black and brown individuals, who have ascended socially, identify themselves and be socially recognized as white [31, 32].

Moreover, in Brazil, self-declaration of race/skin color brown is complex and permeates biological, economic, and, mainly, social issues. A paradox is observed concerning Brazilians who declare themselves black and brown, while the analysis of social and economic indicators, income inequality, educational opportunities, and mobility patterns point to extreme proximity between these two groups, the browns systematically identify a lower perception of racial discrimination when compared to blacks. In addition, browns belonging to the higher economic classes do not report feeling discrimination, while blacks from the same classes report more frequently [33]. Some classical theories, such as “whitening” and “the mulatto escape valve,” could contribute to the understanding of the relationships that involve whites and non-whites in the Brazilian socioeconomic scenario. Thus, we can hypothesize that brown individuals, for having a low perception of racial discrimination, could present lower rates of GAD than black individuals.

The growing body of evidence points to the association of racial discrimination with worse mental health status [34, 35]. In the African American community, racial discrimination was indicated as an important risk factor for physical and mental health, including depression [36]. On the other hand, a strong sense of ethnic identity among African Americans has proved to be a protective factor against mental health problems [37]. In Brazil, a study showed that black Brazilians have a 50% greater chance than whites of having an experience of discrimination, even after adjusting for salary, education, social status, and health problems [38]. In this perspective, the findings by Bastos et al. [29] point out that the discrimination attributed to race/skin color was independently associated

Table 1 Characteristics of the study participants

Variables	All (<i>n</i> = 5879)	
	<i>n</i>	%
Sex		
Female	4324	73.5
Male	1555	26.5
Region		
North	369	6.3
Northeast	2589	44.0
Midwest	365	6.2
Southeast	1701	28.9
South	855	14.5
Race/color		
White (Caucasian)	2945	50.1
Black (Afro-descendant)	749	12.7
Brown	2185	37.2
Economic class		
A	814	13.8
B1	935	15.9
B2	1773	30.2
C1	1210	20.6
C2	824	14.0
D–E	323	5.5
Body mass index		
Underweight	447	7.6
Normal weight	3263	55.5
Overweight	1339	22.8
Obesity	830	14.1
Depression diagnosis		
Yes	849	14.4
No	5030	85.6
Diagnosis of COVID-19		
Yes	413	7.0
No	5466	93.0
Social distancing		
Adhered to social distancing for most of the time, performing only visits to supermarkets and pharmacies	4337	73.8
Adhered to social distancing, but had to leave to work	1362	23.2
Did not adhere to social distancing	180	3.1

with a fourfold increase in the chance of common mental disorders in Brazilian university students, revealing the important contribution of racial discrimination in the mental health of the population.

Smolen and Araújo [39] conducted a systematic review in order to synthesize the findings about race/skin color and mental disorders (depression, anxiety, and common mental disorder) in Brazil. Among the findings of this review, the authors report a higher prevalence of mental disorders in the black population than in the white population in studies

conducted before the COVID-19 pandemic. They also highlight the scarcity of studies that evaluated the relationship between anxiety and race/skin color [39]. Particularly in Brazil, there are important disparities in educational, financial, and social opportunities linked to racial disparities [11, 12]. Chor and Lima [40] believe that the scarcity of epidemiological research relating to race/skin color occurs due to three possible hypotheses: (I) the difficulties of ethnic-racial classification; (II) the acceptance of the “myth of racial democracy,” and (III) the opposition between economic class and race/skin

Table 2 Prevalence ratios from univariable and multivariable analysis for the diagnosis of general anxiety disorder in Brazilian university students according to demographic, clinical, anthropometrics, and social and economic variables

Variables	Univariable analysis			Multivariable analysis ^a		
	PR	IC 95%	p	PR	IC 95%	p
Age (in years)	0.99	0.98, 0.99	< 0.01	0.98	0.97, 0.98	< 0.01
Sex		–			–	
Male	1.00	–		1.00	–	
Female	1.41	1.30, 1.57	< 0.01	1.32	1.22, 1.43	< 0.01
Race/color		–	< 0.01		–	< 0.01
White	1.00	–		1.00	–	
Black (Afro-descendant)	1.07	0.98, 1.16	0.11	1.10	1.01, 1.20	0.02
Brown	0.87	0.81, 0.93	< 0.01	0.92	0.86, 0.98	0.01
Economic class		–	0.14		–	0.02
A	1.00	–		1.00	–	
B1	0.90	0.80, 1.01	0.08	0.90	0.80, 1.00	0.06
B2	1.00	0.91, 1.10	0.91	1.02	0.93, 1.12	0.65
C1	1.08	0.98, 1.20	0.10	1.07	0.97, 1.18	0.17
C2	0.95	0.85, 1.07	0.44	0.98	0.88, 1.10	0.81
D-E	0.96	0.82; 1.12	0.65	1.01	0.87; 1.17	0.88
Body mass index		–	< 0.01		–	< 0.01
Normal weight	1.00	–		1.00	–	
Underweight	0.96	0.84, 1.08	0.53	0.93	0.83, 1.05	0.27
Overweight	1.13	1.05, 1.21	< 0.01	1.15	1.07, 1.24	< 0.01
Obesity	1.32	1.22, 1.43	< 0.01	1.29	1.19, 1.40	< 0.01
Depression diagnosis		–			–	
No	1.00	–		1.00	–	
Yes	1.87	1.77, 1.98	< 0.01	1.78	1.68, 1.89	< 0.01
Diagnosis of COVID-19		–			–	
No	1.00	–		1.00	–	
Yes	1.07	0.96, 1.20	0.18	1.06	0.95, 1.18	0.23
Social distancing		–	0.06		–	0.01
Adhered to social distancing for most of the time, performing only visits to supermarkets and pharmacies	1.00	–		1.00	–	
Adhered to social distancing, but had to leave to work	1.04	0.97, 1.12	0.19	1.08	1.01, 1.15	0.01
Did not adhere to social distancing	0.77	0.62, 0.95	0.01	0.86	0.70, 1.06	0.16

PR prevalence ratio by Poisson regression with robust adjustment of variance, 95% CI 95% confidence interval

^a Prevalence ratios for the diagnosis of general anxiety disorder in multivariable models including age, sex, race/skin color, economic class, body mass index class, diagnosis of depression, diagnosis of COVID-19, and adherence to social distancing measures

color, that is, the study of the economic dimension contemplated the ethnic-racial dimension.

Aiming at historical repair and, consequently, reducing the gap between white and non-white individuals, in 2012, the Brazilian Federal Government approved Law No. 12,711, which reserves 50% of places in undergraduate courses at federal universities (public education network) for public school students and self-declared black, brown, indigenous, and people with disabilities. This legal instrument made it possible to increase the inclusion of blacks and browns in the federal universities, from 8.7 in 2010 to 12.0% in 2018

of students who declare themselves black, and from 32.1 to 39.2% of browns [41]. Although extremely necessary to allow blacks and browns access to public universities, the proportion of black and brown university students is far from the proportions of these races/skin colors in the Brazilian population, and shows that for these groups, reaching university is a greater challenge than for young whites. It is noteworthy that just guaranteeing access is not enough, given that most of these students are in conditions of social vulnerability; student assistance policies in federal institutions of higher education have a fundamental role in maintaining these students within

the university. The absence of student assistance policies could contribute to the increase in GAD among university students, due to the economic and social instability imposed.

In addition, our findings indicate that younger individuals seem to be at greater risk of experiencing anxiety than older individuals. During the COVID-19 pandemic, it was observed that older individuals had better emotional well-being and less reactivity to stressors, while younger individuals had more concerns related to COVID-19 [42]. Furthermore, university students who faced a lack of interaction and emotional support and physical isolation were associated with worse mental health, which may contribute to higher levels of anxiety in this population [43].

According to official data from the Ministry of Education of Brazil and the Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, most of this population is female (57.0%); the average age of students is 25.6 ± 7.4 years, with 99.3% of Brazilian university students aged between 18 and 59 years. As for race/skin color, 41.8% of the students reported being white, 28.8% and 7.0%, brown mixed race and black, respectively. In comparison, our sample has a similar average age and a higher percentage of women (73.5%). In addition our sample contained a greater number of individuals who declared themselves brown (37.2%) and black (12.7%) [44]. Regarding the economic comparison, estimates suggest that about 1.5% of university students belong to economic class A and 22.7% to economic class E [45]. These data differ from those found in our sample, in which 13.8% belonged to economy class A and only 5.5% economic class D-E. Comparisons should be carried out extremely carefully, given that the methods for determining economic classes are different. The method used to determine the estimates of the distribution of economic classes in the population of Brazilian university students is based only on per capita household income, while the instrument we used in our research considers the ownership of assets, the level of education of the head of the family (the person who contributes most of the family income), and access to basic public services (piped water and street paving). Nevertheless, we point out that our sample was composed of more individuals from economic class A and fewer individuals from economic class D-E, which may induce over and under-representation of students from higher and lower economic classes, respectively.

The present study has some limitations. First, we emphasize that given the negationist positioning of the federal government and the different epidemiological scenarios in different regions of Brazil, measures of social distancing were applied differently between the units of the federation. This fact may have influenced the magnitude of the measures to restrict the circulation of people and, consequently, the levels of stress and anxiety in the population of different locations. Another limitation is the self-report of the race/skin colour of the participants, which may not correspond exactly to the

individuals' genetic ancestry. However, data from the possible largest study conducted in Brazil on the relationship between self-declaration of race/skin color and genomic ancestry observed that African genomic ancestry is a strong predictor of self-declaration of race/skin color black and brown, as well as the proportion of black and brown inhabitants in the individuals' residential territory [46]. In addition, the small number of participants who declared themselves yellow and indigenous made it impossible to analyze with these population groups. It is worth mentioning that we did not include in our data collection information about the contamination of family members by COVID-19 and the severity of symptoms, questions about the complete suspension or adoption of the remote education system, and the delay in completing the course and obtaining the diploma due to the pandemic. Moreover, in the multivariable models, there were no interaction in terms of race/skin color with social class, adherence to social distancing measures, and obesity. Hence, possible interferences of these factors may have contributed to the higher risk of GAD for black college students than for white and brown college students. Future research should investigate these interactions for further clarification. Finally, the fear of moral judgment about whether or not to adhere to social distancing measures to contain the spread of COVID-19, may have influenced the self-report of this information in our study. However, the absence of the researcher face to face with the participant can lessen the fear of moral judgment.

As strengths of the study, we highlight that most of the literature on the subject is composed of research conducted in the USA. In this sense, the development of research in Brazilian territory is of paramount importance, as the two countries present cultural, social, economic, and historical differences that can influence the extrapolation of the American results to our population. Thus, in view of the scarcity of Brazilian studies that evaluated the relationship between race/skin color and GAD, our study has an important relevance for the advancement of knowledge of this relationship. In addition, as far as we know, this is the first study that aimed to determine whether there are racial differences in GAD in Brazilian university students during the COVID-19 pandemic. We also highlight that we reached a large sample of university students in Brazil, with distribution among all regions of the country, making it possible to capture the Brazilian social, economic, and cultural diversity in our sample.

Conclusion

In conclusion, the findings of the present study point to a possible racial difference in GAD among Brazilian university students, in which those who declared race/skin color as black showed a greater risk for GAD than those who declared race/skin color as white or brown. We highlight the existence of many gaps in

the scientific knowledge of the determinants of GAD and its relationship with the race/skin color of individuals, thus becoming a fruitful field for scientific investigations, particularly in Brazil, which has a multiracial population and immense economic, cultural, and social diversity. Finally, we emphasize that race/skin color and its relationship with mental health must be investigated and understood not only from a biological perspective, but also from a social perspective resulting from a nation's historical, political, and cultural experiences.

Author Contribution A.E.S.J. contributed to the conception and design of the study, data collection, statistical analysis, data interpretation, and writing of the manuscript. M.L.M., A.D.S.O., and D.R.S.P. contributed to the data collection, data interpretation, and writing of the manuscript. I.R.O.M.P. and N.B.B. contributed to the data interpretation, writing of the manuscript, and critical review of the intellectual content. All authors reviewed and approved the final version of the work.

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Declarations

Ethics Approval The research protocol was approved by the Research Ethics Committee of the Universidade Federal de Alagoas (process number 4.410.403).

Conflict of Interest The authors declare no competing interest.

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