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RESEARCH ARTICLE

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ASSOCIATED FACTORS WITH NEGATIVE SELF-PERCEIVED HEALTH IN UNIVERSITY STUDENTS DURING SOCIAL ISOLATION - COVID-19 PANDEMIC

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ABSTRACT

This study aimed to investigate the prevalence and associated factors with negative self-perceived health in students enrolled in public and private universities in a Brazilian urban centre during the social isolation due to COVID-19 pandemic. It was cross-sectional research developed with a sample of public and private university students. A questionnaire was applied addressing sociodemographic data, clinical conditions, behavioural habits and self-perceived health. Bivariate analysis followed by Poisson regression, with robust variance, were performed to associate the variables with negative self-perceived health. The prevalence of negative self-perceived health during social isolation in the population studied was 52.4%, in 857 university students. Among university students being female, enrolled in a public institution/university, the family having lost income during social isolation and not practising physical activity during social isolation, remained associated with negative self-perception of health. The high prevalence of negative self-perceived health and the associations observed point to the need for health promotion actions aimed at university students in this period of social isolation due to the pandemic of COVID-19.

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INTRODUÇÃO

The first case of the disease caused by the new coronavirus was registered in December 2019, becoming known worldwide as COVID-19. This first appearance occurred in Wuhan, China, which informed the World Health Organization (WHO) about the outbreak of a new acute respiratory disease, similar to pneumonia, with a mortality rate of 2%¹. In January 2020, the cases began to spread to other regions of the world and affected 26 countries, which led the WHO to declare an international public health emergency^{2,3}. The first case of COVID-19 in Latin America was registered in Brazil, in São Paulo, at the end of February of 2020⁴. WHO declared COVID-19 epidemic as a pandemic on 11 March 2020, and the disease had, until that date, infected more than 118,000 people in 114 countries and 4,291 deaths⁵. There were 2,915 confirmed cases in Brazil, and 77

deaths in this period, according to official data from the Ministry of Health⁶, and community transmission were declared. In this context, Brazil began to adopt measures to control and prevent the disease. Among the measures, social isolation was included, which, according to WHO, contact between potentially infected and healthy conditions, would delay the peak of the epidemic and, consequently, the magnitude of its effects⁷. On 17 March, the Ministry of Education (MEC)⁸, decreed the suspension of face-to-face classes, replacing them with remote classes. This situation should prevail until the complete epidemiological control of the COVID-19 pandemic⁸. Up to June 2020, thousands of young people were in social isolation, carrying out academic activities under vulnerability conditions. They experience expressive emotional and behavioural transformations, which can affect the state and health care⁹. This condition can be measured by assessing self-perceived health, which is a significant health indicator, having been used in population surveys, and is

associated with physical, cognitive and emotional aspects in different population subgroups^{10,11,12}, and university students¹³. This study investigated the prevalence, and associated factors with negative self-perceived health in university students enrolled in public and private higher education institutions in a Brazilian urban centre during social isolation due to COVID-19 pandemic. The context of this Brazilian urban centre (Montes Claros, Minas Gerais) is important because it represents a transition area between the more and less developed (Southeast to Northeast), besides it constitutes a university pole of reference for a region, which has more than 2 million inhabitants.

METHODOLOGY

This study was as part of a project entitled "Health conditions of university students during the period of social isolation in the face of the COVID-19 pandemic", developed by a group of researchers from the State University of Montes Claros, approved by the Research Ethics Committee referred by the number 4.040.766. The target population was limited to university students, aged 18 years and above, enrolled in the public and private universities of a large centre in the north of Minas Gerais. This region represents a transition area between the Southeast, more developed, and the Northeast, less developed¹². A pilot study conducted prior to the study, with university students belonging to the same age group, allowed the questionnaires' test. After this phase, adjustments were performed in the instrument, and data collection for this research started. The Google Forms® online platform was used, and the social network was used, publicly Whatsapp@ as a means of dissemination to the target audience. The instrument was available for seven consecutive days, from May 20 to 26, 2020. The applied questionnaire had questions previously validated and already used in other studies^{14,15,16,17}. The dependent variable was represented by self-perceived health, extracted from the Vigitel¹⁴ questionnaire, and adapted to the context of social isolation, through the question: "in the period of social isolation, how do you consider your health status?". The four categories of response were dichotomized into positive (for the "very good" and "good" options) and negative (for the "regular" and "bad" options).

The independent variables were subdivided into sociodemographic, clinical, and behavioural conditions. The sociodemographic aspects were sex (male; female), age (≤ 22 years; > 22 years), type of institution/university (private; public), area of higher education (other areas; health area), loss of family income in the period social isolation (no; yes), some family member lost their job during the period of social isolation (no; yes). Additionally, there was an inclusion of two questions regarding the fear of COVID-19 contamination. As for clinical factors, respiratory diseases were addressed (no; yes). Weight and height were self-reported, and Body Mass Index (BMI) subsequently calculated using the Quetelet formula, later categorized as (normal; changed)¹⁵. Behavioural habits were assessed through the questions: "During the period of social isolation, you have been practising regular physical exercises" (yes; no). As for the consumption of ultra-processed foods, the concept and examples of which foods would be considered ultra-processed^{16,17} were presented, and later the related question; "in the period of social isolation the consumption of ultra-processed foods" (decreased; increased). The statistical program SPSS (Statistical Package for the Social Sciences), version 21 was used for data analysis. Initially, an exploratory, descriptive analysis of the data was performed, with the study variables' frequency distribution. Afterwards, bivariate analyses were carried out, looking for associations between independent variables and negative self-perception of health, using the chi-square test. Associated variables up to the level of 20% ($p \leq 0,20$) were selected for multivariate analysis. Considering that the Poisson regression with robust variance provides correct estimates and is a better alternative for the analysis of cross-sectional studies with binary results¹⁸, the crude prevalence ratios (PR) were calculated with their respective 95% confidence intervals. Those variables that were associated up to the 25% level ($p \leq 0,25$) were included in the multiple Poisson regression analysis with robust variance, and adjusted

prevalence ratios and their respective 95% confidence intervals (CI 95%), with a significance level of 5% ($p < 0,05$) being adopted for the final model.

RESULTS

The sample consisted of 857 university students, of which 52.4% had a negative perception of health. Results of the bivariate analysis between self-perceived health, and the independent variables are in Table 1. The following variables were associated with the 25% level: sex, type of institution/university, course area, loss of family income during social isolation, employment loss during social isolation, body mass index, physical activity during social isolation, consumption of ultra-processed foods and "in the last few weeks I have had trouble sleeping because I worry about the possibility of becoming infected by COVID-19" (Table 1). After multivariate analysis, the following variables remained associated with negative self-perceived health: being female, linked to a public institution/university, losing family income during the period of social isolation, having an adequate BMI and not practising physical activity during isolation (Table 2).

DISCUSSION

Understanding how university students perceive their health conditions is fundamental for adopting preventive and health promotion strategies in a population that is considered vulnerable. With the students' entry into higher education, they tend to adopt inappropriate behaviours for health when questioning the family's values, beliefs, and attitudes in the education process¹⁹. When reflected in behaviours, such questions can influence a health status perceived positively or negative way²⁰. Self-perceived health is an indicator increasingly used in epidemiological studies, strongly associated with people's real or objective health status, incorporating their physical, cognitive and emotional aspects²¹. Studies show that the individual's perception of health is a strong predictor of morbidity and mortality²²; being a health measure strongly associated with the use of health services²³. During the period of social isolation imposed by the COVID-19 pandemic, the prevalence of negative self-perceived health among university students investigated in this study exceeded 50%, a significant percentage and consistent with the few studies exploring the impacts of COVID-19 and the quarantine on the mental health of university students, mainly regarding the levels of depression, anxiety and stress²⁴. A significant association with negative self-perceived health was recorded for females, corroborating with other studies. Similar results were found by Wang et al.²⁵ that researched 1,210 university students in 194 cities in China. Maia and Dias²⁴ performed an investigation with 159 students between the suspension of classes and the decree instituted the state of emergency in Portugal due to COVID-19 and found similar results. These data are consistent with previous studies suggesting greater indicators of depression, anxiety and stress among women²⁶. However, studies carried out in the economic crisis period indicate a significant increase in this symptom among men²⁷.

The negative self-perception of health was associated with the attendance of a public institution. This issue may be related to the graduate student's socio-economic profile in higher education, which in Brazil has changed in recent years due to structural policies in education, allowing the inclusion of groups with a history of exclusion from this educational level. The University for All Program (PROUNI)²⁸, the Unified Selection System (SISU) and the Quota Law in Federal Institutions (Law 12.711, of 29 August 2012)²⁹ and the Higher Education Student Financing Fund (FIES)³⁰ are examples of such policies. The changes were characterized by an increase in the representation of blacks and mixed-race, students with a family income of up to three minimum wages and from public schools, making the impact of the Quota Law evident in federal institutions of higher education³¹. The relationship between socio-economic level and health status is well established in the literature. Factors such as

Table 1. Perception of health status by university students according to sociodemographic factors, clinical factors, behavioural habits and fear of being contaminated by COVID-19

Variables	Self-perceived Health				p-value*
	Negative		Positive		
	n	%	n	%	
Sociodemographic factors					
<i>Sex</i>					
Male	139	61,8	86	38,2	0,000
Female	269	42,6	363	57,4	
<i>Age</i>					
≤ 22 anos	264	46,6	303	53,4	0,216
> 22 anos	144	49,7	146	50,3	
<i>Type of institution/university</i>					
Private	297	49,8	299	50,2	0,0029
Public	111	42,5	150	57,5	
<i>Course area</i>					
Other areas	92	45,1	112	54,9	0,0229
Health area	316	48,4	337	51,6	
<i>Loss of family income during social isolation</i>					
No	154	58,3	110	41,7	0,000
Yes	254	42,8	339	57,2	
<i>Employment loss during social isolation</i>					
No	333	50,2	330	49,8	0,003
Yes	75	38,7	119	61,3	
Clinical Factors					
<i>Respiratory diseases</i>					
No	295	48,3	316	51,7	0,292
Yes	113	45,9	133	54,1	
<i>Body mass index</i>					
Normal	222	60,0	148	40,0	0,000
Changed	186	38,2	301	61,8	
Behavioural Habits					
<i>Physical activity during social isolation</i>					
Yes	222	60,0	148	40,0	0,000
No	186	38,2	301	61,8	
<i>Consumption of ultra-processed foods during social isolation</i>					
Decreased	76	55,1	62	44,9	0,034
Increased	332	46,2	387	53,8	
<i>Fear of being contaminated by COVID-19</i>					
Yes	361	46,8	410	53,2	0,103
No	47	54,7	39	45,3	
<i>For the past few weeks, I have been having trouble sleeping with the possibility of contaminating myself</i>					
No	366	52,9	326	47,1	0,000
Yes	42	25,5	123	74,5	

*(χ^2) = Pearson's Chi-square test; p value = Significance level $p < 0.20$.

social status, employment, poverty and social exclusion influence health status. The most complex issue is related to determining each one's influence, such as income, which impacts access to certain behaviours, such as participating in physical activities and choosing healthy foods for consumption³². Within this thought, the negative self-perception of health can still be related to the number of people in the same house, the house's quality, and the expectation regarding the length of the social isolation. Brazil is a country with variable housing conditions, and comfort and structure can make a big difference, whether or not there is social isolation, but the conditions of that isolation³³. According to the 2018 Higher Education Census, almost 2/3 of higher education enrolments are in federal institutions³⁴. The National Survey of Socioeconomic and Cultural Profile of Undergraduate Students of Federal Higher Education Institutions (IFES) of 2018, indicated that the percentage of quotholders went from 3.1%, in 2005, to 48.3%, in 2018, the number of students in the family monthly income per capita up to one and a half minimum wages went from 44.3% in 2003 to 66.2% in 2014, reaching 70.2% in 2018. The results confirm that federal universities started to express the diversity of the Brazilian population and income inequality³⁵. The family's loss of income in the pandemic period was another associated factor. This finding is similar to that found in a survey conducted in Bangladeshi³⁶ among university students in-home quarantine, which described financial uncertainty as a stressor, significantly related to higher stress levels, anxiety and depression. In the context of the COVID-19 pandemic, there is a relation of some main stressors to economic difficulties³⁷.

However, the global economic recession trend affects everyone, further worsening the health of population groups in socio-economic vulnerability, especially those who make up the mass of unemployed or underemployed in Brazil. Measures of household isolation impact informal workers' income, which may impact wage earners by the risk of dismissal and/or reduced working hours, with a consequent decrease in their income. The weakening of employment ties, already triggered by the current economic crisis context, tends to be exacerbated in the pandemic³⁸. Another association with the outcome variable found in this study was to present an adequate BMI regarding clinical-behavioural factors. Although the association between excess body weight and negative self-rated health is well described in the literature, especially when comparing overweight individuals to their peers without this condition, whether university students, teenagers or adults³⁹⁻⁴³, this study cannot attest to the same association. The divergence of the results may be related to the fact that the present investigation was conducted through a self-report that, even though it is a validated method⁴⁴, it may still incur under or overestimate the event. The lack of physical activity during social isolation was another association of negative self-perception of health, supporting literature for discussion^{33,45-49}. After the arrival of COVID-19 in Brazil, the imposed social isolation to control and prevent the disease, although different from one region to another, impacted the population's life. The performance of regular physical exercises became challenging³³. In addition to issues related to increased BMI, the practice of a physical activity is closely related to mental health, with evidence on self-esteem, socialization, decreased stress and anxiety^{45,46}.

Table 2. Crude and adjusted prevalence ratio for health perception according to sociodemographic factors, clinical factors, behavioural habits and fear of being contaminated by COVID-19

Variables	Negative Self-Perception of Health%	PR _{crude} (CI _{95%})	PR _{adjusted} (CI _{95%})
Sociodemographic Factors			
<i>Sex</i>			
Male	61,8	1	1
Female	42,6	2,28 (1,59 - 2,97)	1,42 (1,19 - 1,71)
<i>Age</i>			
≤ 22 years	46,6	1	-
> 22 years	49,7	0,88 (0,66 - 1,17)	-
<i>Institution/University</i>			
Private	49,8	1	1
Public	42,5	1,34 (1,10 - 1,8)	1,23 (1,09 - 1,39)
<i>Course area</i>			
Other areas	45,1	1	-
Health area	48,4	0,87 (0,63 - 1,20)	-
<i>Loss of family income during social isolation</i>			
No	58,3	1	1
Yes	42,8	1,86 (1,39 - 2,50)	1,35 (1,16 - 1,57)
<i>Employment loss during social isolation</i>			
No	50,2	1	-
Yes	38,7	1,60 (1,15 - 2,22)	-
Clinical Factors			
<i>Respiratory diseases</i>			
No	48,3	1	-
Yes	45,9	1,09 (0,81 - 1,47)	-
<i>Body mass index</i>			
Normal	60,0	1	1
Changed	38,2	1,20 (0,893 - 1,63)	1,13 (0,99 - 1,28)
Behavioural Habits			
<i>Physical activity during social isolation</i>			
Yes	60,0	1	1
No	38,2	2,42 (1,84 - 3,20)	1,47 (1,29 - 1,69)
<i>Consumption of ultra-processed foods during social isolation</i>			
Decreased	55,1	1	-
Increased	46,2	1,42 (0,99 - 2,06)	-
<i>Fear of contaminating by COVID-19</i>			
Yes	46,8	1	-
No	54,7	0,73 (0,46 - 1,14)	-
<i>For the past few weeks, I have been having trouble sleeping with the possibility of contaminating myself</i>			
No	52,9	1	-
Yes	25,5	3,28 (2,24 - 4,81)	-

The tendency is that people who practise physical activities are more prone to positive self-perception of health. In northern Minas Gerais, regular physical activity is performed by more than 45% of adolescents, according to a population-based study carried out in the region⁴⁷. In this context, it is possible to understand the association found in this study. A survey conducted in Portugal demonstrated the value of physical exercise for promoting health and quality of life for a population composed mostly of elementary, high school, university and graduate students⁴⁸. In the study by Leão et al.⁴⁹, the absence of physical activity was one of the variables associated with depression among university students in northeastern Brazil, which corroborates the importance of the physical activity to maintain health and control stress, and consequently positive self-perception of health. This study has limitations. It is possible to highlight some items of the questionnaire used as a data collection instrument, even though validated, may have been misunderstood or answered distorted, since it was a self-administered questionnaire. The negative self-perception of health can also be related to other factors not investigated, such as each individual's personality and the perceived social / family support.

CONCLUSION

This study showed a prevalence of negative self-perceived health during social isolation, of 52.4% in university students. Female, enrolled in a public institution/university, loss of family income and

the absence of physical activity were associated with negative self-perception of health. This study raises important questions regarding physical/mental health and COVID-19 pandemic. It may help understand the relationship between physical/mental health and the pandemic, the search for maintaining health and quality of life, considering that this will depend on how threatened people feel. The high prevalence of negative self-perceived health and the associations observed indicate the need for university students' health promotion actions.

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