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Impact of Covid-19 on the mental health, quality of life and level of physical activity in university students

Impacto da Covid-19 na saúde mental, qualidade de vida e nível de atividade física em universitários

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ABSTRACT

Young people can have negative repercussions on their mental health, quality of life and on illnesses related to physical inactivity due to social isolation and fear of the disease (Covid-19). This study aimed to analyze the impact of the Covid-19 pandemic on the quality of life, level of physical activity and mental health of university students. College students (16-24 years old) completed an online interview, considering possible changes in mental health, quality of life and physical activity level, evaluating the moment before and during the pandemic. The recruitment strategy of the participants was the snowball type. 1,167 young people (69.2%-women) attended in the study, of which 8.8% had a confirmed diagnosis of Covid-19. There was a worsening in all scores of quality of life, stress and depression during the pandemic when compared to the period prior to the pandemic ($p < 0.001$). The pandemic also increased inactivity among young people (49.1% *vs* 28%, $p < 0.001$). Female students, from the health area, who had their own home and who did not have confirmed diagnosis of Covid-19 showed increased stress in the pandemic period. The Covid-19 pandemic worsened the indicators of mental health, quality of life and level of physical activity among university students. It is noteworthy that despite not being a risk group for the aggravation of the disease and consequent higher mortality, restrictions related to the pandemic limited or prevented the movement of people and this isolation can represent important changes in health in the medium and long term in this population.

Keywords: Coronavirus; Quality of life; Mental health; Physical activity; Teenagers.

RESUMO

Jovens podem ter repercussões negativas em sua saúde mental, qualidade de vida e em doenças relacionadas com a inatividade física devido ao isolamento social e medo da doença (Covid-19). Este estudo teve como objetivo analisar o impacto da pandemia da Covid-19 na qualidade de vida, nível de atividade física e saúde mental de jovens universitários. Jovens universitários (16 a 24 anos) completaram uma entrevista online, considerando possíveis mudanças na saúde mental, qualidade de vida e nível de atividade física considerando o momento anterior e durante a pandemia. A estratégia de recrutamento dos participantes foi do tipo bola de neve. Participaram 1.167 jovens (69,2% mulheres), dos quais 8,8% tiveram diagnóstico de Covid-19 confirmado. Houve uma piora em todos os escores de qualidade de vida, estresse e depressão durante a pandemia quando comparados com o período anterior à pandemia ($p < 0,001$). A pandemia também aumentou a inatividade nos jovens (49% vs 28%, $p < 0,001$). Estudantes do sexo feminino, da área de saúde, que tinham casa própria e que não tiveram diagnóstico confirmado de Covid-19 apresentaram aumento do estresse no período pandêmico. A pandemia Covid-19 piorou os indicadores de saúde mental, qualidade de vida e nível de atividade física de jovens universitários. Chama atenção que apesar de não ser um grupo de risco para o agravamento da doença e consequente maior mortalidade, restrições relacionadas a pandemia limitaram ou evitaram a circulação de pessoas e esse isolamento pode representar importantes modificações na saúde a médio e longo prazo nesse público.

Palavras-chave: *Coronavirus;Qualidade de vida; Saúde mental; Atividade física; Jovens.*

Introduction

In December 2019, there was the first contamination by the new coronavirus, called SARS-CoV-2 (severe acute respiratory syndrome coronavirus-2), in the city of Wuhan, China. The high transmission capacity and rapid identification of the virus in several countries, has raised concern among health authorities around the world, leading the World Health Organization (WHO) to declare a "pandemic" state on March 11, 2020, a health emergency of global proportions[1,2].

Covid-19 disease mainly affects the respiratory systems of individuals and can cause complications in various organs, tissues and even death. The main symptoms are fever, cough and breathing difficulties. Given the absence of more effective means of prevention such as the vaccine and even adequate treatment, in 2020, the WHO recommended social distancing as the main way to fight the pandemic[3].

The Covid-19 pandemic has shown negative impacts on the world's health and economy. In the general population, studies indicate that university students may be susceptible to the negative impacts of physical distance imposed as a preventive measure[2-6]. This group has peculiarities due to the period they are experiencing, which involves physical, psychological and social changes, characteristic of the period of adolescence and youth. Thus, the assessment of the impacts of Covid-19 on the health of young people must be carried out with a broader perspective and not only due to the immediate absence of the disease[2].

Due to the increase in the number of cases and mortality during the pandemic, all Brazilian states adopted numerous measures to restrict the movement of people in public and private areas, in order to minimize the risk of contagion by the virus. For this purpose, the suspension of classes in public and private schools and universities, suspension of non-essential services in person, beach and park closure, among other measures were established[2].

Despite being a strategic measure to control the spread of the virus, the physical distance and consequent social isolation, associated with the high transmission power of the virus, uncertainties about the treatment of the disease, in addition to the unpredictability of the duration of the pandemic and its developments, can brought unintended negative consequences, contributed to increased sedentary lifestyle and compromised mental health, thus contributing to a decrease in the quality of life of individuals[7,8].

Considered at lower risk for the incidence of severe cases and mortality by Covid-19, university students would be being neglected in health care and surveillance. The consequences of the pandemic in this population, in the medium and long term, could be disastrous, generating social, educational and economic consequences that are still unknown. Therefore, the aim of the present study was to analyze the impact of the Covid-19 pandemic on the quality of life, level of physical activity and mental health of young university students.

Methods

This is an analytical cross-sectional study that used web-based data collection, using the platform called "Google forms", from August to December 2020. The Ethics Committee approved the study for Research Involving Human Beings of the institution (Nº - 4.218.865) and all participants signed the terms in accordance with the resolutions in force in the country.

At the beginning of the study, Brazil had about 1,761,391 confirmed cases and more than 118,649 deaths, reaching up to 182,799 deaths by the end of the collection[9]. Inclusion criteria were young university students aged between 16 and 24 years, residing in Brazil and with Internet access. Those who had any illness or disorder that could incapacitate the understanding or answer to the questionaires evaluated through the analysis of inconsistent answers were excluded.

The strategy for recruiting participants was the snowball method, carried out by disseminating the study among representatives of the class and student movements, directors of higher education institutions, coordinators, professors and participants in research groups. Dissemination also took place through social media, contact with colleges and universities, graduate programs, professional and educational associations, and professional councils. In addition, some professors, principals, coordinators and leaders of research groups allowed the dissemination of the research on their social networks, online classes and their email contacts. In these disclosures there was a direct link to the survey that could be forwarded by anyone and increase the recruitment strategy.

The research evaluated issues related to demographic and general aspects such as age, gender, marital status, graduation course, period of the course, work status prior the pandemic, place of residence (urban/rural area), educational institution, state of location of the educational institution and residence, housing condition (own/rented), race/color and religion. It was also asked whether the student was diagnosed or had someone close (friend, family or acquaintance) who was diagnosed with Covid-19. The mental health, quality of life and level of physical activity questionnaires were answered twice in a single access considering the previous moment and the one that was being experienced during the pandemic, at the time of filling out the questionnaire.

The questionnaire from the Brazilian Association of Research Companies[10] was used to assess the Brazilian Economic Classification Criteria[10], which stratifies

individuals economically into six classes: A, B1, B2, C1, C2, D and E.

The World Health Organization Quality of Life questionnaire short version (WHOQOL-BREF) was used to assess quality of life[11]. This questionnaire has 26 questions, divided into four domains: physical, psychological, social relationships and environment. The "physical"domain addresses seven questions about pain and discomfort; energy and fatigue; sleep and rest; mobility; activities of everyday life; dependence on medication or treatment, and ability to work. "Psychological" domain, composed of six questions: positive feelings; thinking, learning, memory and concentration; self esteem; body image and appearance; negative feelings, and spirituality/religion/personal beliefs. Domain "social relationships", composed of three questions: personal relationships; social support, and sexual activity. Domain "environment", composed of eight questions: physical security and protection; environment at home; financial resources; health and social care; opportunities to acquire new information and skills; recreation/leisure opportunities; transport, and physical environment (pollution/noise/traffic/climate)[11].

To assess the mental health of individuals, the Depression Anxiety Stress Scale[12] reduced version was used, with 21 questions, which assesses depression, anxiety and stress, considering the following classifications for depression: normal (0-9), mild (10-13), moderate (14-20), severe (21-27), extremely severe (28 or more), anxiety: normal (0-7), mild (8-9), moderate (10-14), severe (15-19), extremely severe (20 or more), stress: normal (0-14), mild (15-18), moderate (19-25), severe (26-33), extremely severe (34 or more)[12].

Physical activity level was evaluated with the short version of the International Physical Activity Questionnaire (IPAQ)[13], which was validated and translated to Brazilian Portuguese. This questionnaire[13] classifies the individual as very active, active, irregularly active or sedentary, according to frequency, duration and intensity of weekly physical activities. Individuals classified in the IPAQ[13] as activeand very active were considered active. For this, the following criteria had to be met: a) vigorous physical activity with a frequency equal to or greater than three days/week with a duration equal to or greater than 20 minutes/session; b) moderate physical activity or walking with a frequency equal to or greater than five days/week and duration equal to or greater than 30 minutes/session; c) any physical activity whose combined frequency was equal to or greater than five days/week and lasting equal to or greater than 150 minutes/week. Subjects who did not meet the aforementioned criteria (insufficiently active and sedentary) were classified as inactive.

All data were processed in the IBM-SPSS-22.0 Software. Initially, descriptive statistics were performed, where frequency, mean, median and standard deviation were calculated. Kolmogorov-Smirnov tests were performed to verify the normality of the data. Since the data were not normal, a non-parametric Wilcoxon test for quantitative variables and chi-square tests for qualitative variables were performed. All conclusions were based on a 5% significance level.

Results

A total of 1,203 young people answered the electronic questionnaire, of which 12 were duplicates and 24 incompletes, leaving 1,167 participants. Students from all regions of Brazil participated, but most were from the northeast region and around 87% from the state of Pernambuco. An analysis was performed comparing the variables between the state with the highest representation and respondents from other states and there was no difference in the results, for this reason, it was decided to include all subjects in the same analysis. Demographic and socioeconomic characteristics are shown in Table 1.

A confirmed diagnosis of Covid-19 was reported by 8.8% of respondents, but 61.9% of participants reported that someone close (friend, family member or acquaintance) had a positive diagnosis for the disease. When analyzing these two items in a combined way, it was observed that 62.6% of the cases either had Covid or reported that someone close was affected by the disease (data not shown in tables).

There was an increase in depression and stress scores in this population and a worsening in all quality of life domains during the pandemic period (Table 2). During this same period, physical inactivity increased from 28% to almost 50% ($p < 0.001$). When asked about satisfaction with their health, the percentage of dissatisfied people increased from 13.3% to 22.3% (Table 2).

Discussion

The results of the present study indicated that university students had worse rates of depression, stress, QL and LPA in the pandemic period compared to that referred to in the period prior to its outbreak. The increase in stress in this period was present in females,

Table 1 – Demographic and socioeconomic characteristics.

Variable	N = 1167	%
Sex		
Feminine	807	69.2
Masculine	360	30.8
Age		
16 to 19	302	25.9
20 to 24	865	74.1
Course Area		
Exact Sciences	121	10.4
Human	201	17.2
Health	844	72.4
Marital Status		
Married	15	1.3
Single	1151	98.6
Widower	1	0.1
Race/Color		
Yellow	13	1.1
White	574	49.2
Brown	423	36.2
Black	135	11.6
Do not know	22	1.9
Religious affiliation		
Catholic	412	35.3
Spiritist	51	4.4
Evangelical	238	20.4
African matrix	5	0.4
Other	10	0.9
Has no defined religion	451	38.6
Place of residence		
Countryside	86	7.4
Urban area	1081	92.6
House condition		
Leased	249	21.3
Own	918	78.7
It works		
Yes	216	18.5
Not	951	81.5
Social class		
A	114	9.8
B	447	40.9
C	440	37.7
D/E	136	11.7

in students in the health area, in people who had their own home and in those students who were not diagnosed with Covid-19 when compared to their peers. Young people from the highest social class and from the Spiritist religion did not change their mental health. Students who were married and of the African religion did not change their QL during the pandemic period when compared to before.

Although the study did not assess the occurrence of domestic and sexual violence and any inference to these issues should be viewed with caution, a possible explanation for the impairment of women's mental health, may be explained by the increase in cases of domestic and sexual violence during the pandemic, since there is a greater permanence of men at home, associated with the demands of society that are imposed on the role of women and their greater predisposition to mood disorders, which can be intensified by the period of changes experienced by youth[2,28]. The mental impairment of young people in health courses may be related to the fact that, unlike courses in other areas, they must fulfill a large part of their workload, with pratical classes, which were very compromised due to the suspension of classroom classes during the pandemic[29].

In addition, isolation in urban areas in many cases occurred in apartments, further restricting movement and social contact, harming mental health, to the detriment of those who live in rural areas, which allows us to reflect that living in rural areas or the simple contact of at least two hours a week with nature can contribute to the promotion of mental health, as observed in other studies[18,30]. University students who did not have Covid-19 presented, in addition to depression, an increase in the level of stress, which can be explained by the result of some research, which showed that the fear of being contaminated by a potentially fatal virus and even coming to the death can affect the individual's psychological well-being[14].

The clinical manifestations of the disease with a higher degree of severity were evidenced, mainly, in the elderly and people with chronic diseases, while young people were not considered risk groups for the development of complications of Covid-19[2]. However, social isolation has impacted a wider spectrum of the population, with young people being especially vulnerable to mental illness, considering that at this stage of life, group social relationships and friendship relationships are extremely important for psychosocial construction of the individual[15,16]. Despite the impact that can be generated on the mental health of young people, with the measures adopted, specific public policies were not created for this population.

The public health policies available are mostly directed to groups with a higher risk, morbidity, or mortality profile. In this context, fragility in coping with mental disorders is observed, which is neglected due to the difficulty of diagnosis and scarcity of resources

Table 2 – Mental health, quality of life and level of physical activity before and during the Covid -19 pandemic.

Variables	Before	During	p*
Mental Health Scores			
Anxiety	8.0 (2.0-18.0); 10.6	8.0 (2.0-18.0); 10.6	0.826
Depression	10.0 (4.0-20.0); 11.7	12.0 (4.0-22.0); 13.3	<0.001
Stress	16.0 (10.0-24.0); 16.4	16.0 (8.0-26.0); 17.3	<0.001
Domains of Quality of Life			
Physical	71.4 (60.7-82.1); 71.2	64.2 (50.0-75.0); 61.7	<0.001
Psychological	65.0 (55.0-75.0); 63.5	55.0 (40.0-70.0); 55.5	<0.001
Social relationships	66.6 (58.3-75.0); 67.0	58.3 (41.6-75.0); 59.7	<0.001
Environment	62.5 (53.1-75.0); 63.6	59.3 (46.8-71.8); 59.5	<0.001
QL perception	18.7 (18.7-18.7); 19.3	18.7 (12.5-18.7); 17.0	<0.001
health satisfaction	18.7 (12.5-18.7); 16.6	12.5 (12.5-18.7); 14.7	<0.001
Global quality of life score	16.0 (14.0-18.0); 15.4	14.0 (12.0-16.0); 14.1	<0.001
How satisfied are you with your health?			
Dissatisfied	155 (13.3)	260 (22.3)	
Neither satisfied nor dissatisfied	287 (24.6)	348 (29.8)	<0.001
Pleased	725 (62.1)	559 (47.9)	
Physical Activity Level			
Active	840 (72.0)	594 (50.9)	<0.001
Inactive	327 (28.0)	573 (49.1)	

Data were expressed as Median (25-75% percentile); Trimmed mean or absolute frequency (%). Trimmed mean = mean value excluding 5% of extreme values. *Wilcoxon and Chi square test. Values in bold represent significant difference (Significance level adopted in the study p<0.05).

to offer resolute and adequate care, among other problems. The provision of assistance worsens even further under exceptional health conditions, such as during the Covid-19 pandemic, a period in which there was a necessary redirection of resources and health care efforts.

The results described here can support health strategies that are able to deal with priorities related to the pandemic, without disregarding young people in this context[7,21]. The direction of policies and programs to face the problems resulting from the pandemic and social isolation must be designed[21] for this population, as well as support from the academic and family community. The world is subject to pandemics and catastrophes[23], however assistance plans for all populations must be designed to try to minimize any damage to health. The repercussions of a poor quality of life, impaired mental health and low levels of physical activity in these young people who have a long-life expectancy can be very harmful[2,23,27,30]. Listening and student assistance programs aimed at identifying some mental disorder could be mandatory in pedagogical political projects of courses and in higher education schools, with laws that guarantee the necessary financial and human support, especially for young people with greater social vulnerability, female and in the health area, as shown in this study.

A recent survey showed that about 76% of university students living in Brazil, aged between 18 and 21 years, declared that the Covid-19 pandemic negatively impacted their mental health. Brazil had the highest registered index, among the 21 countries that participated in the survey reported above[16]. Studies carried out in China and France also showed impairment in the mental health of young people[17,18]. Despite the worsening in mental health reported in these studies, the authors[16,18] did not follow up the period before the pandemic, making comparisons with our study difficult.

This study not only evidenced changes in the mental health of young people, but also in the QL and LPA, expressing a problem that can have repercussions throughout the lives of these young people. What may be even more worrisome is the fact that the incidence of Covid-19 cases and mortality has only increased. In June 2021, Brazil ranked second in the number of deaths by Covid-19 worldwide[19], a fact that occurred five months after data collection was carried out, which may make the current data even more critical, showing the need for urgent monitoring of these university students.

The etiology of mental disorders in adolescence has been an object of much discussion in recent years[3]. Considering the stressful environment of the Covid-19 pandemic, we evidenced three risk factors: viral infec-

Table 3 – Variables that can interfere with the mental health outcome before and during the pandemic.

Variables	Anxiety			Depression			Stress		
	Before	During	p	Before	During	p	Before	During	p
Sex									
Female	10.0 (4.0-20.0)	10.0 (4.0-20.0)	ns	12.0 (4.0-20.0)	14.0 (4.0-24.0)	**	16.0 (12.0-26.0)	20.0 (12.0-28.0)	**
Male	4.0 (0.0-12.0)	4.0 (0.0-12.0)	ns	8.0 (2.0-14.0)	8.0 (2.0-16.0)	*	12.0 (6.0-20.0)	12.0 (4.0-20.0)	ns
Course area			ns						
Exact Sciences	8.0 (0.0-14.0)	6.0 (0.0-15.0)	ns	8.0 (4.0-18.0)	8.0 (2.0-23.0)	ns	14.0 (6.0-22.0)	14.0 (6.0-24.0)	ns
human	10.0 (2.0-21.0)	10.0 (2.0-22.0)	ns	12.0 (4.0-24.0)	14.0 (6.0-24.0)	*	16.0 (8.0-26.0)	18.0 (8.0-28.0)	ns
Health	8.0 (4.0-18.0)	8.0 (2.0-18.0)	ns	10.0 (4.0-18.0)	12.0 (4.0-22.0)	**	16.0 (10.0-24.0)	16.0 (10.0-26.0)	**
Marital status									
Married	6.0 (4.0-10.0)	6.0 (2.0-12.0)	ns	10.0 (6.0-16.0)	14.0 (6.0-24.0)	*	14.0 (8.0-16.0)	16.0 (12.0-20.0)	*
Single	9.0 (2.0-18.0)	8.0 (2.0-18.0)	ns	10.0 (4.0-20.0)	12.0 (4.0-22.0)	**	16.0 (10.0-24.0)	16.0 (8.0-26.0)	**
Race/color									
Yellow	18.0 (5.0-26.0)	16.0 (2.0-28.0)	ns	16.0 (4.0-24.0)	16.0 (4.0-28.0)	ns	26.0 (12.0-28.0)	16.0 (10.0-30.0)	ns
White	8.0 (4.0-18.0)	8.0 (2.0-18.0)	ns	10.0 (4.0-20.0)	12.0 (4.0-22.0)	**	16.0 (10.0-24.0)	18.0 (10.0-28.0)	*
Brown	8.0 (2.0-16.0)	8.0 (2.0-16.0)	ns	10.0 (4.0-18.0)	12.0 (4.0-20.0)	**	14.0 (8.0-22.0)	14.0 (6.0-24.0)	ns
Black	10.0 (2.0-18.0)	10.0 (2.0-20.0)	ns	12.0 (4.0-20.0)	14.0 (4.0-24.0)	*	16.0 (10.0-24.0)	18.0 (10.0-26.0)	*
Do not know	13.0 (0.0-22.5)	16.0 (0.0-28.5)	ns	11.0 (5.5-24.5)	14.0 (3.5-26.5)	ns	21.0 (4.0-28.5)	21.0 (10.0-34.5)	ns
Religious affiliation									
Catholic	8.0 (10.0-16.0)	8.0 (2.0-18.0)	ns	8.0 (4.0-16.0)	10.0 (4.0-20.0)	*	14.0 (8.0-22.0)	14.0 (6.0-24.0)	ns
Spiritist	10.0 (4.0-20.0)	10.0 (2.0-16.0)	ns	12.0 (6.0-18.0)	10.0 (4.0-20.0)	ns	16.0 (12.0-24.0)	16.0 (12.0-28.0)	ns
Evangelical	8.0 (4.0-16.0)	8.0 (2.0-16.0)	ns	8.0 (4.0-16.0)	12.0 (4.0-20.0)	**	14.0 (8.0-22.0)	16.0 (9.5-26.0)	*
African	16.0 (13.0-32.0)	18.0 (8.0-32.0)	ns	16.0 (8.0-3.0)	18.0 (11.0-25.0)	ns	24.0 (12.0-30.0)	26.0 (15.0-34.0)	*
Other	12.0 (3.5-26.5)	26.0 (5.5-33.0)	*	13.0 (7.0-21.0)	24.0 (13.0-32.0)	*	17.0 (9.0-25.5)	23.0 (8.0-36.5)	ns
It does not have	10.0 (4.0-18.0)	8.0 (2.0-20.0)	ns	12.0 (4.0-24.0)	14.0 (6.0-26.0)	**	18.0 (10.0-26.0)	18.0 (10.0-28.0)	*
Place of residence									
Countryside	10.0 (2.0-20.5)	10.0 (2.0-20.5)	ns	12.0 (4.0-22.5)	14.0 (6.0-22.0)	*	14.0 (8,0-22.5)	16.0 (8.0-24.0)	ns
Urban area	8.0 (2.0-18.0)	8.0 (2.0-18.0)	ns	10.0 (4.0-18.0)	12.0 (4.0-22.0)	**	16.0 (10.0-24.0)	16.0 (8.0-26.0)	**
House condition									
Leased	10.0 (4.0-19.0)	10.0 (3.0-20.0)	ns	12.0 (4.0-20.0)	14.0 (6.0-24.0)	**	16.0 (12.0-26.0)	20.0 (10.0-28.0)	ns
Own	8.0 (2.0-18.0)	8.0 (2.0-18.0)	ns	10.0 (4.0-18.0)	12.0 (4.0-22.0)	**	16.0 (8,0-22.0)	16.0 (8.0-26.0)	**
It works									
Yes	10.0 (4.0-20.0)	10.0 (2.0-22.0)	ns	10.0 (4.0-22.0)	14.0 (4.0-24.0)	*	16.0 (8.0-24.0)	17.0 (8.0-27.5)	*
Not	8.0 (2.0-18.0)	8.0 (2.0-18.0)	ns	10.0 (4.0-18.0)	12.0 (4.0-22.0)	**	16.0 (10.0-24.0)	16.0 (8.0-26.0)	**
Social class									
A	8.0 (2.0-18.0)	6.0 (0.0-14.0)	ns	6.0 (4.0-16.5)	8.0 (2.0-18.0)	ns	16.0 (10.0-24.0)	16.0 (8.0-26.0)	ns
B	8.0 (2.0-16.0)	8.0 (2.0-16.0)	ns	10.0 (2.0-18.0)	10.0 (4.0-22.0)	**	14.0 (8.0-22.0)	16.0 (8.0-26.0)	*
C	10.0 (4.0-18.0)	10.0 (4.0-20.0)	ns	12.0 (6.0-20.0)	14.0 (6.0-24.0)	**	16.0 (10.0-24.0)	18.0 (10.0-26.0)	*
D/E	10.0 (2.5-20.0)	12.0 (2.0-22.0)	ns	12.0 (6.0-22.0)	14.0 (6.0-24.0)	*	14.0 (8.0-24.0)	16.0 (8.5-28.0)	*
Confirmed diagnosis									
Yes	8.0 (2.0-18.0)	8.0 (2.0-18.0)	ns	8.0 (4.0-16.0)	12.0 (4.0-24.0)	*	18.0 (10.0-22.0)	16.0 (8.0-26.0)	ns
Not	10.0 (2.0-18.0)	8.0 (2.0-18.0)	ns	10.0 (4.0-20.0)	12.0 (4.0-22.0)	**	16.0 (10.0-24.0)	16.0 (8.0-26.0)	**
Someone confirmed diagnosis									
Yes	10.0 (2.0-18.0)	10.0 (2.0-18.0)	ns	12.0 (4.0-20.0)	12.0 (4.0-22.0)	**	16.0 (10.0-24.0)	18.0 (10.0-26.0)	**
Not	8.0 (2.0-17.0)	8.0 (2.0-18.0)	ns	9.0 (4.0-18.0)	12.0 (4.0-22.0)	**	14.0 (8.0-22.0)	14.0 (6.0-26.0)	*
Confirmed diagnosis or someone close									
Yes	10.0 (2.0-18.0)	10.0 (8.0-18.0)	ns	10.0 (4.0-20.0)	12.0 (4.0-22.0)	**	16.0 (10.0-24.0)	18.0 (10.0-26.0)	**
Not	8.0 (2.0-17.5)	8.0 (2.0-18.0)	ns	10.0 (4.0-18.0)	12.0 (4.0-22.0)	**	14.0 (8.0-22.0)	14.0 (6.0-26.0)	ns

Data were expressed as median (25-75% percentile). Wilcoxon test (* $p < 0.05$, ** $p < 0.001$ and ns = not significant).

Table 4 – Variables that can interfere in the domains of quality of life before and during the pandemic.

Variables	Domains of Quality of Life											
	Physical			Psychological			Social relations			Environment		
	Before	During	p	Before	During	p	Before	During	p	Before	During	p
Sex												
Female	71.4 (60.7-78.5)	60.7 (46.4-71.4)	**	65.0 (50.0-75.0)	55.0 (40.0-70.0)	**	66.6 (58.3-75.0)	58.3 (41.6-75.0)	**	62.5 (53.1-75.0)	59.3 (46.8-71.8)	**
Male	75.0 (64.2-82.1)	67.8 (53.5-78.5)	**	65.0 (55.0-75.0)	60.0 (45.0-73.7)	**	66.6 (50.0-83.3)	58.3 (43.7-75.0)	**	65.6 (53.1-78.1)	62.5 (50.0-75.0)	**
Course Area												
Exact Sciences	75.0 (60.7-82.1)	64.2 (50.0-75.0)	**	65.0 (50.0-75.0)	55.0 (40.0-70.0)	**	66.6 (50.0-75.0)	66.6 (41.6-75.0)	**	62.5 (50.0-75.0)	62.5 (46.8-71.8)	**
Human	67.8 (60.7-78.5)	60.7 (46.4-71.4)	**	60.0 (50.0-75.0)	55.0 (40.0-70.0)	**	66.6 (50.0-75.0)	58.3 (41.6-75.0)	**	56.2 (46.8-65.6)	50.0 (40.6-62.5)	**
Health	71.4 (64.2-82.1)	64.2 (50.0-75.0)	**	65.0 (55.0-75.0)	55.0 (45.0-70.0)	**	66.6 (58.3-83.3)	58.3 (50.0-75.0)	**	65.6 (53.1-78.1)	62.5 (50.0-75.0)	**
Marital Status												
Married	71.4 (64.2-82.1)	67.8 (53.5-82.1)	ns	60.0 (60.0-80.0)	55.0 (50.0-75.0)	ns	83.3 (66.6-83.3)	75.0 (58.3-91.6)	ns	56.2 (34.7-68.7)	53.1 (34.3-65.6)	ns
Single	71.4 (60.7-82.1)	64.2 (50.0-75.0)	**	65.0 (55.0-75.0)	55.0 (40.0-70.0)	**	66.6 (58.3-75.0)	58.3 (41.6-75.0)	**	62.5 (53.1-75.0)	59.3 (46.8-71.8)	**
Race/Color												
Yellow	71.4 (67.8-78.5)	64.2 (51.7-76.7)	ns	65.0 (50.0-77.5)	60.0 (35.0-72.5)	*	66.6 (50.0-79.1)	58.3 (50.0-75.0)	ns	56.2 (43.7-59.3)	50.0 (31.2-59.3)	ns
White	71.4 (64.2-82.1)	64.2 (50.0-75.0)	**	65.0 (55.0-75.0)	55.0 (40.0-70.0)	**	66.6 (58.3-75.0)	58.3 (50.0-75.0)	**	68.7 (56.2-78.9)	65.6 (50.0-78.1)	**
Brown	71.4 (64.2-82.1)	60.7 (50.0-75.0)	**	65.0 (55.0-75.0)	55.0 (45.0-70.0)	**	66.6 (50.0-75.0)	58.3 (41.6-75.0)	**	59.3 (50.0-71.8)	56.2 (43.7-68.7)	**
Black	71.4 (60.7-78.5)	60.7 (50.0-75.0)	**	65.0 (50.0-75.0)	55.0 (40.0-70.0)	**	66.6 (50.0-83.3)	58.3 (41.6-75.0)	**	59.3 (43.7-71.8)	56.2 (40.6-68.7)	**
Do not know	64.2 (50.0-83.0)	51.7 (45,5-72,3)	*	55.0 (40.0-70.0)	45.0 (30.0-66.2)	*	62.5 (58.3-75.0)	66.6 (33.3-68.7)	ns	59.3 (49.2-75.0)	53.1 (42.1-65.6)	*
Religious Affiliation												
Catholic	71.4 (64.2-82.1)	64.2 (50.0-75.0)	**	65.0 (55.0-75.0)	55.0 (45.0-70.0)	**	66.6 (58.3-75.0)	58.3 (50.0-75.0)	**	65.6 (53.1-78.1)	62.5 (50.0-71.8)	**
Spiritist	71.4 (60.7-82.1)	64.2 (50.0-75.0)	*	65.0 (55.0-70.0)	60.0 (40.0-70.0)	*	75.0 (58.3-83.3)	66.6 (41.6-83.3)	*	71.8 (59.3-78.1)	68.7 (56.2-78.1)	ns
Evangelical	71.4 (63.3-82.1)	64.2 (50.0-75.0)	**	70.0 (55.0-75.0)	60.0 (45.0-75.0)	**	66.6 (58.3-83.3)	66.6 (50.0-75.0)	**	59.3 (49.2-71.8)	59.3 (43.7-68.7)	**
African	64.2 (51.7-80.3)	35.7 (17.8-67.8)	ns	70.0 (57.5-77.5)	35.0 (25.0-70.0)	ns	75.0 (33.3-79.1)	75.0 (33.3-79.1)	ns	59.3 (40.6-78.1)	46.8 (35.9-78.1)	ns
Other	69.6 (60.7-85.7)	66.0 (58.9-74.1)	ns	57.5 (50.0-75.0)	55.0 (33.7-66.2)	ns	75.0 (56.2-87.5)	58.3 (43.7-77.0)	*	54.6 (40.6-67.1)	53.1 (28.9-65.6)	ns
It does not have	71.4 (60.7-82.1)	60.7 (46.4-75.0)	**	60.0 (50.0-70.0)	55.0 (35.0-65.0)	**	66.6 (50.0-75.0)	58.3 (41.6-75.0)	**	62.5 (53.1-78.1)	59.3 (46.8-71.8)	**
Place of Residence												
Countryside	67.8 (57.1-75.8)	60.7 (42.8-71.4)	**	60.0 (50.0-70.0)	50.0 (35.0-65.0)	**	62.5 (50.0-75.0)	58.3 (33.3-75.0)	**	54.6 (40.6-62.5)	50.0 (34.3-57.0)	**
Urban area	71.4 (64.2-82.1)	64.2 (50.0-75.0)	**	65.0 (55.0-75.0)	55.0 (40.0-70.0)	**	66.6 (58.3-75.0)	58.3 (41.6-75.0)	**	65.6 (53.1-78.1)	62.5 (46.8-71.8)	**
House Condition												
Leased	71.4 (64.2-78.5)	64.2 (46.4-75.0)	**	65.0 (55.0-75.0)	55.0 (40.0-70.0)	**	66.6 (50.0-75.0)	58.3 (41.6-75.0)	**	62.5 (53.1-75.0)	62.5 (46.8-71.8)	**
Own	71.4 (60.7-82.1)	64.2 (50.0-75.0)	**	65.0 (55.0-75.0)	55.0 (45.0-70.0)	**	66.6 (58.3-75.0)	58.3 (50.0-75.0)	**	62.5 (53.1-75.0)	59.3 (46.8-71.8)	**
It Works												
Yes	71.4 (60.7-78.5)	60.7 (50.0-71.4)	**	65.0 (50.0-75.0)	55.0 (40.0-70.0)	**	66.6 (50.0-75.0)	58.3 (41.6-75.0)	**	57.8 (50.0-71.8)	53.1 (40.6-65.6)	**

Continue…

Contine of **Table 4 –** Variables that can interfere in the domains of quality of life before and during the pandemic.

Variables	Domains of Quality of Life											
	Physical			Psychological			Social relations			Environment		
	Before	During	p	Before	During	p	Before	During	p	Before	During	p
Not	71.4 (64.2-82.1)	64.2 (50.0-75.0)	**	65.0 (55.0-75.0)	55.0 (40.0-70.0)	**	66.6 (58.3-75.0)	58.3 (41.6-75.0)	**	65.6 (53.1-78.1)	62.5 (46.8-75.0)	**
Social class												
A	75.0 (67.8-82.1)	64.2 (50.0-75.0)	**	70.0 (55.0-75.0)	55.0 (45.0-71.2)	**	75.0 (64.5-83.3)	66.6 (50.0-75.0)	**	81.2 (68.7-87.5)	78.1 (62.5-87.5)	**
B	75.0 (64.2-82.1)	64.2 (51.7-75.0)	**	65.0 (55.0-75.0)	60.0 (45.0-70.0)	**	75.0 (58.3-83.3)	66.6 (50.0-75.0)	**	68.7 (56.2-78.1)	65.6 (53.1-75.0)	**
C	67.8 (60.7-78.5)	60.7 (46.4-71.4)	**	65.0 (50.0-75.0)	55.0 (40.0-65.0)	**	66.6 (50.0-75.0)	58.3 (41.6-75.0)	**	59.3 (50.0-68.7)	53.1 (40.6-65.6)	**
D/E	67.8 (57.1-78.5)	57.1 (46.4-75.0)	**	60.0 (50.0-73.7)	50.0 (40.0-68.7)	**	58.3 (50.0-75.0)	58.3 (41.6-75.0)	**	50.0 (40.6-59.3)	43.7 (34.3-55.4)	**

Data were expressed as median (25-75% percentile). African = African Matrix. Wilcoxon test (*p < 0.05, **p < 0.001 and ns = not significant).

tion, antiviral treatments and the direct and indirect effects of social isolation and the collective experience of the pandemic[20]. The effects of confinement and collective trauma are the most responsible for the repercussions on mental health, with the intensity of social distancing, the quality of family relationships and the duration of this isolation, important variables in the assessment of emotional damage[21].

According to McClelland et al.[22], loneliness is as harmful as smoking and obesity in terms of long-term health effects and is a significant risk for suicidal behavior. A study from the University of Bath showed that loneliness is linked to mental health problems, such as depression and anxiety[23]. In this sense, physical activity can be an ally in reducing stress and improving mental health. Sixty minutes of daily physical activity can improve anxiety, depressive symptoms and stress, in addition to promoting a healthy lifestyle[21,24].

In our study, a significant decrease in the LPA of young people was observed when compared to the period before the pandemic (28% *vs* 50%, p < 0.001), which may have contributed to a decrease in QL and an increase in levels of depression and stress. The physical domain of the QL questionnaire may have been directly impacted due to the decrease in LPA evidenced in our study. When one realizes how long these people are exposed to risk, added to the sedentary behavior already reported, before the pandemic, it is understood that the impact of this lifestyle, intensified by the pandemic, can contribute to mental and physical[25] illness over time.

The pandemic brought a series of changes in behavior and challenges to be faced, not only with regard to the disease directly, but everything that surrounds it. Fears, uncertainties, anxieties, social distancing from peers or friends, caused by the confinement of university students in their homes, already have repercussions, as seen in our study. In this context, the QL of these individuals may have been compromised. The QL reflects the perception of individuals that their needs are being met or that they are being denied opportunities to achieve happiness and self-fulfillment, regardless of their physical health status or social and economic conditions[26].

In our study, the domains "social relationships" and "environment" were considerably impacted by the pandemic. The change observed can be explained by the implementation of social isolation measures, such as the closing of public and private universities. The observed impact was possibly not greater because during the study period (August to December 2020), many states in Brazil were not in lockdown (quarantine) and the number of new cases and deaths was falling in early September, showing a slight increase in early December[9]. Isolation combined with a decrease in income can also justify the decrease in the score in the "environment" domain, as according to UNICEF, more than half of the Brazilian population (55%) had a reduction in their family income during the pandemic [27], a fact that which can also influence the psychological aspect of the individual, as observed in the study by Wathelet et al[18], which reported an association between income loss and changes in metal health and also by our study that did not observe changes in individuals of social class high.

Regarding the psychological domain, which encompasses questions about positive/negative feelings and spirituality/religion/personal beliefs, the decrease

in the score of that domain during the pandemic was noticeable, possibly due to all the issues related to the pandemic, related to social isolation, to the illness of oneself and of family members, which can contribute to the emergence of negative thoughts, thus interfering with spirituality/religiosity. It is noteworthy that young people from the Spiritist religion did not change their mental health and the African parent religion did not change their QL in the pandemic. Those students who were married, due to the presence of someone to share their anxieties, may have been preserved, even with the prohibition of university life and intense social life.

A possible limitation of the study was the memory bias with questions about the level of psychosocial stress, QL and LPA, as a comparison between a past and a present moment in the same period of time was performed. However, the study was carried out with young people with a good educational level, a group that in general is not vulnerable to cognitive deficits that can impact the memory of recent events. Another issue that should be considered is the selection bias and low participation of young people from other states, which may not characterize the reality of the country as a whole and should be considered when thinking about a possible external validation of the data. The option for analysis with all participants was due to the fact that the same results were found in a separate analysis.

The pandemic had a negative impact on the mental health of university students, with regard to depression and stress, also affecting their QL and LPA. Female students from the health area, people who had their own home and who had not been diagnosed with Covid-19, presented with higher levels of stress when compared to their peers. Young people from higher social class and from the spiritist religion did not show any impairment in their mental health. Students who were married and from the African religion did not change their quality of life in the pandemic. It is necessary to implement policies to face the problems resulting from the pandemic and social isolation, as well as support from the academic and family community.

Conflict of interest

The authors declare no conflict of interest.

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Author's contributions

Santos APR, Souza JNVA and Silva BRVS, participated in the research and methodological review. Aquino JM, Oliveira MCP, Santos MAM, Barros MVG, Silva LMP and Correia Junior MAV, performed the writing and editing of the manuscript and critical review of the content.

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