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Financial difficulties, dietary and health aspects in university students during the Covid-19 pandemic

Dificuldades financeiras, aspectos alimentares e de saúde em estudantes universitários, durante a pandemia de Covid-19

Abstract

Introduction: The financial difficulties caused by the pandemic due to economic changes in the country, in addition to affecting food and nutrition security and the state of health of individuals, resulted in greater evasion from higher education courses. **Objective:** To check the association between financial difficulties during the COVID-19 pandemic with the dietary and health aspects of undergraduate students from Universidade Federal de Juiz de Fora (Federal University of Juiz de Fora – UFJF). **Methods:** Transversal study with UFJF undergraduate students. The data were collected between September 2020 and March 2021, via an online survey. The chi-square test ($p < 0.05$) was used to evaluate the factors associated with financial difficulties during the pandemic. We also checked the odds ratio (OR) for the associations found. **Results:** We assessed 584 undergraduate students, 31.7% of which were found to have gone through financial difficulties during the pandemic. We observed that the presence of financial difficulties in that period was positively associated with Food and Nutrition Insecurity (INSAN, Portuguese acronym), negative self-perception of health, bad sleep quality, and changes in depression, anxiety, and stress levels. Moreover, individuals characterized as having financial difficulties had a higher chance of having INSAN, negative perception of health, bad sleep quality, as well as changes in the levels of depression, anxiety, and stress, when compared to their counterparts. **Conclusion:** We concluded that financial difficulties during the pandemic period are associated with INSAN and affected health aspects. Therefore, we highlight that there is a need for the development of strategies which aim to provide financial and psychological assistance to undergraduate students.

Keywords: COVID-19. Financial Difficulties. Students. Food Insecurity

Resumo

Introdução: As dificuldades financeiras advindas da pandemia, em virtude de mudanças econômicas do país, além de refletirem no estado de segurança alimentar e nutricional e no estado de saúde dos indivíduos, acarretaram o aumento da evasão dos cursos superiores. **Objetivo:** Verificar a associação entre as dificuldades financeiras, durante a pandemia de Covid-19, com os aspectos alimentares e de saúde dos graduandos da Universidade Federal de Juiz de Fora (UFJF). **Método:** Estudo transversal com graduandos da UFJF. Os dados foram coletados entre setembro de 2020 e março de 2021, através de questionário *on-line*. Utilizou-se Teste Qui-quadrado ($p < 0,05$) para avaliar os fatores associados às dificuldades financeiras durante a pandemia. Verificou-se a razão de chances (*Odds Ratio* - OR) das

associações encontradas. **Resultados:** Avaliaram-se 584 graduandos, dentre os quais se constatou que 31,7% passaram por dificuldades financeiras durante a pandemia. Notou-se que a presença de dificuldades financeiras no período pandêmico se associou positivamente à presença de Insegurança Alimentar e Nutricional (INSAN), à autopercepção negativa de saúde, à má qualidade do sono e às alterações de depressão, ansiedade e estresse. Além disso, os indivíduos caracterizados com dificuldades financeiras tinham maiores chances de apresentarem INSAN, percepção negativa de saúde, má qualidade do sono, bem como alterações nos níveis de depressão, ansiedade e estresse, quando comparados à sua contraparte. **Conclusão:** Conclui-se que as dificuldades financeiras durante o período pandêmico são associadas à presença de INSAN e aspectos de saúde alterados. Assim, ressalta-se a necessidade de criação de estratégias que visem à assistência financeira e psicológica dos graduandos.

Palavras-chave: COVID-19. Dificuldades Financeiras. Estudantes. Insegurança alimentar.

INTRODUCTION

In March 2020, the World Health Organization (WHO) acknowledged as a pandemic the infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-COV-2). This disease, known as Covid-19, attacked mainly the respiratory system, causing mild, moderate, and severe symptoms, depending on the state of health of the individual.¹

As a result, several measures to control the spread of the disease were taken by governments, including non-pharmacological interventions, social distancing, and closing non-essential businesses, industries, schools, and universities.²

Such strategies, despite being extremely necessary, brought about several changes to the economic scenario in Brazil,³ negatively impacting the income of families and, consequently, the lifestyle, diet and health of individuals.⁴⁻⁶

It is evident that the decrease in family income may affect the life habits of university students, which impacts the mental and dietary wellbeing of this group.⁷ Furthermore, financial difficulties caused by the pandemic due to job loss, a lack of efficient income transfer policies, and changes in the workplace not only reflect the state of food and nutrition security (SAN, Portuguese acronym) and the state of health of individuals, but may also lead to an increase in the evasion from higher education courses.^{2,8,9}

Therefore, this study aimed to check the association between financial difficulties during the Covid-19 pandemic with dietary and health aspects of undergraduate students from Universidade Federal de Juiz de Fora (Federal University of Juiz de Fora – UFJF).

METHODS

Study design, participants and recruitment

This is a transversal study with undergraduate students from UFJF. The data in the present work was obtained from another study with a broader scope, titled “Eating behavior, self-esteem and lifestyle of students, teachers, and administrative staff at UFJF during the Covid-19 pandemic”.

The sample size was calculated with the aid of *StatCalc* from the EpiInfo™ software, version 7.2.0.1 (Georgia, United States of America). The sample calculation took into consideration the following criteria: 95% confidence level, 50% prevalence in relation to the analyzed variables, 5% maximum permissible error and 10% in possible losses, resulting in a minimum of 416 participants.

The following inclusion criteria were contemplated: minimum of 18 years of age, being an undergraduate student at UFJF.

Data collection took place between September 2020 and March 2021, through an online questionnaire on Google Forms, allowing for the research to occur remotely, based on the recommendations of social distancing during the Covid-19 pandemic. Contact with participants was also carried out remotely, by promoting the study via social media platforms, websites, and electronic mail, which was done by the Diretoria de Imagem Institucional (Institutional Image Board) of UFJF.

The applied questionnaire was analyzed in two main sessions. In the first, the aim was to characterize the sample according to the following data: age (in years), sex (female, male, others), and race/skin color (white, mixed race, black, indigenous, and yellow). In the second session, data on the pandemic period, when the financial difficulties, self-perception of health, SAN, sleep quality, and presence of anxiety, stress, and depression were investigated.

The study was approved by the Comitê de Ética em Pesquisa com Seres Humanos (Ethics Committee for Research with Human Beings) at Universidade Federal de Juiz de Fora (CAAE 36626920.0.0000.5147). We also highlight that the signed Term of Free and Informed Consent was requested at the moment of data collection.

Dependent variable

We adopted as a dependent variable the presence of financial difficulties during the pandemic, assessed through the question: “Did you and/or your family go through financial difficulties during the pandemic, or still do?” (no, yes).

Independent variables

Among the independent variables, there are: SAN, self-perception of health, sleep quality, and levels of stress, anxiety, and depression.

SAN was evaluated using the Brazilian Food Insecurity Scale (EBIA, Portuguese acronym). It is comprised of 14 questions, which check the perception of the family head regarding access to food in the three previous months. EBIA assesses food and nutrition insecurity, classifying the situation of individuals into four categories: food security, mild food insecurity, moderate food insecurity, and severe food insecurity.¹⁰

It is important to highlight that the classification of insecurity differs in homes where individuals under 18 years of age reside (food security [0 score], mild food insecurity [1-5 score], moderate food insecurity [6-10 score], severe food insecurity [11-14 score]) and in homes where only individuals at or above 18 years of age reside (food security [0 score], mild food insecurity [1-3 score], moderate food insecurity [4-6 score], severe food insecurity [7-8 score]).¹¹ Due to statistical aspects, we classified the results as “presence of food security” (food security) and “absence of food security” (mild, moderate and severe food insecurity).

Self-perception of health was analyzed by the following question: “In general, how do you evaluate your health during the pandemic?”. The answers were categorized dichotomously into “negative” (terrible, bad) and “positive” (moderate, good, excellent).

Sleep quality was assessed via the translated version of the Pittsburgh Sleep Quality Index questionnaire.¹² The instrument has 24 questions, in which sleep is evaluated through seven components, which include: subjective sleep quality, latency, sleep duration, efficiency, sleep disturbances, medication use, and daytime dysfunction. Each of the seven components generates a score which varies between 0 and 3 and, the bigger the sum of these scores, the worse is the sleep quality of the individual. The obtained data were categorized dichotomously into “good quality” (score ≤ 5) and “bad quality” (score > 5).¹²

The sorting of depression, stress, and anxiety was assessed using the Brazilian translated and validated version of the Depression, Anxiety and Stress Scale – DASS-21.¹³ The DASS-21 is a self-report instrument, whose items are divided into three factors (depression, anxiety, stress), and whose answers are of the four-point Likert type, varying from 0 (not at all applicable) to 4 (very or mostly applicable). Each scale is comprised of seven items, with questions 1, 6, 8, 11, 12, 14, and 18 comprising the stress subscale; questions 2, 4, 7, 9, 15, 19, and 20 comprising the anxiety subscale; and questions 3, 5, 10, 13, 16, 17, and 21 comprising the depression subscale. The result is obtained via the sum of the subscales multiplied by two, in order to make it equivalent with the original scale.^{13,14}

We classified depression in the following manner: normal (0-9), mild (10-12), moderate (13-20), severe (21-27), and extremely severe (28-42). Anxiety levels were classified as normal (0-6), mild (7-9), moderate (10-14), severe (15-19), and extremely severe (20-42). Regarding stress, it was classified as: normal (0-10), mild (11-18), moderate (19-26), severe (27-34), extremely severe (35-42).¹³⁻¹⁴ Due to statistical aspects, we classified levels of depression, anxiety and stress as “normal” and “altered” (mild, moderate, severe, and extremely severe)

Statistical analysis

The analyses were carried out within the SPSS® software (version 21.0; SPSS Inc., EUA). At first, we carried out descriptive analyses by means of absolute (n) and relative (%) frequencies, with confidence intervals of 95% (CI95%), as well as central tendency (mean) and dispersion (standard deviation) measures. We used Pearson's chi-square test to ascertain the factors associated with financial difficulties during the pandemic. We also calculated the odds ratio (OR) for the associations found with the chi-square test. Statistical significance was verified by p-value<0.05

RESULTS

In total, 584 undergraduate students from UFJF participated in the study, with an average of 24.3 (\pm 7.2) years of age, the majority being female (75.0%) and white (62.2%) (Table 1). However, we must highlight that, for the race/skin color and sleep quality variables, some individuals failed to answer the questions, which generated a total filling number inferior to that of the other variables.

Table 1. Sample characterization, 2020-2021 (n=584). Juiz de Fora, MG.

| Variables | n | % (CI95%) |
|--------------------------|-----|------------------|
| Sex | | |
| Female | 438 | 75.0 (71.3-78.5) |
| Male | 140 | 24.0 (20.6-27.6) |
| Others | 6 | 1.0 (0.4-2.2) |
| Race/skin color (n=563)* | | |
| White | 350 | 62.2 (58.0-66.2) |
| Mixed race | 155 | 27.5 (23.9-31.4) |
| Black | 56 | 9.9 (7.6-12.7) |
| Indigenous | 1 | 0.2 (0.0-0.7) |
| Yellow | 1 | 0.2 (0.0-1.3) |

Abbreviation: CI95% = 95% confidence interval. *Some participants did not want/know how to answer.
Source: Authors, 2023.

We found that 31.7% of the population reported financial difficulties during the pandemic. Other information relevant to the pandemic period can be found in Table 2.

The individuals who reported going through financial difficulties during the pandemic had a greater prevalence of food and nutrition insecurity (INSAN), negative self-perception of health, bad sleep quality, and altered levels of depression, anxiety, and stress, when compared to those who did not have such difficulties (p<0.05) (Table 2)

Table 2. Financial difficulties, food and nutrition security, and state of health of UFJF undergraduate students, during the COVID-19 pandemic, 2020-2021 (n=584). Juiz de Fora, MG

| Variables | n | % (CI95%) |
|-----------------------------|-----|-------------------|
| Financial difficulties | | |
| No | 399 | 68.3 (64.4-72.1) |
| Yes | 185 | 31.7 (27.9-35.6) |
| Food and nutrition security | | |
| Presence of security | 343 | 58.7 (54.6-62.8) |
| Absence of security | 241 | 41.3 (37.2-45.4) |
| Self-perception of health | | |
| Positive | 448 | 76.7 (73.1-80.1) |
| Negative | 136 | 23.3 (19.9-26.9) |
| Sleep quality (n=579)* | | |
| Good quality | 151 | 26.1 (22.5-29.9) |
| Bad quality | 428 | 73.9 (70.1-77.5) |
| Depression | | |
| Normal | 170 | 29.1 (25.5-33.0) |
| Altered | 414 | 70.69 (67.0-74.5) |
| Anxiety | | |
| Normal | 201 | 34.4 (30.6-38.4) |
| Altered | 383 | 65.6 (61.6-69.4) |
| Stress | | |
| Normal | 111 | 19.0 (15.9-22.4) |
| Altered | 473 | 81.0 (77.6-84.1) |

Abbreviation: CI95% = 95% confidence interval. *Some participants did not want/know how to answer.

Source: Authors, 2023.

We found, through odds ratio analyses, that the individuals characterized as having financial difficulties had greater chances of presenting INSA [OR=6.37 (CI95%=4.33-9.37)], negative health perception [OR=3.33 (CI95%=2.24-4.97)], bad sleep quality [OR=2.34 (CI95%=1.49-3.67)], as well as altered levels of depression [OR=2.41 (CI95%=1.57-3.7)], anxiety [OR=1.77 (CI95%=1.21-2.61)], and stress [OR=2.27 (CI95%=1.36-3.79)], when compared to their counterparts (Table 3).

Table3. Variables associated with financial difficulties of undergraduate students from UFJF, 2020-21. Juiz de Fora, MG.

| Variables | Financial Difficulties | | | | | | | |
|---------------------------|------------------------|------|-----|------|-------|------|--------------|---------|
| | No | | Yes | | Total | | $\chi^2(df)$ | p-value |
| | n | (%) | n | (%) | N | (%) | | |
| Food security | | | | | | | 97.511 (1) | 0.000 |
| Presence of security | 289 | 72.4 | 54 | 29.2 | 343 | 58.7 | | |
| Absence of security | 110 | 27.6 | 131 | 70.8 | 241 | 41.3 | | |
| Self-perception of health | | | | | | | 37.035 (1) | 0.000 |
| Positive | 335 | 84.0 | 113 | 61.1 | 448 | 76.7 | | |
| Negative | 64 | 16.0 | 72 | 38.9 | 136 | 23.3 | | |
| Sleep quality | | | | | | | 14.172 (1) | 0.000 |
| Good quality | 122 | 30.7 | 29 | 15.9 | 151 | 26.1 | | |
| Bad quality | 275 | 69.3 | 153 | 84.1 | 428 | 73.9 | | |
| Depression | | | | | | | 16.671 (1) | 0.000 |
| Normal | 137 | 34.3 | 33 | 17.8 | 170 | 29.1 | | |
| Altered | 262 | 65.7 | 152 | 152 | 414 | 70.9 | | |
| Anxiety | | | | | | | 8.610 (1) | 0.003 |
| Normal | 153 | 38.3 | 48 | 25.9 | 201 | 34.4 | | |
| Altered | 246 | 61.7 | 137 | 74.1 | 383 | 65.6 | | |
| Stress | | | | | | | 10.309 (1) | 0.001 |
| Normal | 90 | 22.6 | 21 | 11.4 | 111 | 19.0 | | |
| Altered | 309 | 77.4 | 164 | 88.6 | 473 | 81.0 | | |

Note: Pearson's chi-square test ($p < 0.05$). Abbreviation: χ^2 = chi-square; df = degrees of freedom. Source: Authors, 2023.

DISCUSSION

The findings of the present study show that around a third of the undergraduate students from UFJF reported financial difficulties during the pandemic. We also found that the individuals with financial difficulties had higher frequencies of INSAN, negative self-perception of health, bad sleep quality, and altered levels of depression, anxiety, and stress, when compared to the undergraduate students who did not go through such difficulties.

The pandemic scene has directly impacted the Brazilian economy and has made the socioeconomic vulnerabilities of the country evident.¹⁵ Research carried out in the five Brazilian regions indicated that 86.0% of the sample had their finances badly affected during the pandemic,¹⁶ a far superior percentage to what was found in this study (31.7%). Such difference may be attributed to the composition of the analyzed samples, as the present study focused on undergraduate students, whereas the quoted research investigated individuals at different schooling levels.¹⁶ We also highlight that universities, despite their inclusivity, are still elite spaces and comprised of a select group,¹⁷ which also contributes to the difference between our findings and the general Brazilian scenario.

The fact that a third of the sample has reported financial difficulties denotes the need for fomentation of projects and policies in the universities and in society, which may be under INSAN conditions and, consequently, with nutritional problems.¹⁸

Regarding SAN, we identified that 41.3% of the individuals had INSAN. This percentage differs from what was observed for the undergraduate students (average of 26.1 (\pm 7.6) years of age) from Universidade de Integração Internacional da Lusofonia Afro-Brasileira (University of International Integration of Afro-Brazilian Lusophony – UNILAB), in a study which found that 84.3% of the individuals had INSAN.¹⁹ Such a difference might be explained by the profile of the students, since the majority of UFJF students were white, while the majority of UNILAB students were self-declared black (black and mixed race). In that study, the mixed race (PR=1.0) and black (PR=1.9) individuals presented greater prevalence ratios for moderate and severe food insecurity than white individuals (PR=0.6).¹⁹

Race is directly linked to income, which reflects economic inequalities between white and black people which have significant implications, including a greater propension to INSAN, as found in the studies. A study by Instituto de Pesquisa Econômica Aplicada (Institute of Applied Economic Research – IPEA), highlighted the economic disparities faced by black people during the pandemic, contributing to the prevalence of INSAN and financial stress in the group.²⁰

It is important to highlight that SAN refers to the regular and permanent access to food in sufficient quality and quantity, without compromising access to other basic necessities,²¹ as the Human Right to Adequate Food (HRAF) is provided for in Article 6 of the Federal Constitution.¹⁸ In that sense, the scenario caused by the pandemic, which was marked by financial losses, corroborates the insecurity of food rights.^{2,18} Data from the National Survey on Food Insecurity in the Context of the Covid-19 Pandemic in Brazil (2021) show that there has been an increase in the number of individuals who do not have enough food every day, around 20.5% of the Brazilian population, as well as an increase in those who are in hunger.²²

We highlight that the high rate of individuals without food rights security was worsened by the current political, economic and sanitary crisis.¹⁸ However, the beginning of this setback in guaranteeing HRAF took place with the dismantling of the social protection policies in 2016, with the start of the presidency of Michel Temer, when there was a cut in resources for the Sistema Nacional de Segurança Alimentar e Nutricional (National System for Food and Nutrition Security), and other structuring programs such as Bolsa Família, in addition to the

extinction of the Conselho Nacional de Segurança Alimentar e Nutricional (National Council for Food and Nutrition Security – Consea) in 2019.¹⁸

We highlight that many homes went through situations of complete lack of food.²² In addition to that, the data shows that routine changes resulted in a shift in the pattern of food consumption of families, characterized by the substitution of food items, opting for those of a lower price and easier preparation, which meant an increase in the consumption of ultra-processed foods.²³

In this scenario, which is marked by financial instability and an absence of effective income transfer policies and the consequent worsening in diet and even hunger, it is necessary to create measures which aim to promote social security and soften the possible nutritional problems provenient from food and nutrient restrictions, such as obesity, malnutrition, and several non-communicable chronic diseases.^{2,18,24} Such measures must also be implemented in the context of universities, ensuring permanence and equitable access to students.

We found that 23.3% of the students had a negative self-perception of health, results which are in accordance with those found by a study carried out in Brazil, which reported that one of the factors for the increasing rates of negative self-evaluation of health was the context of income changes within the population.²⁵ Moreover, 38.9% of the undergraduate students with financial difficulties reported a negative self-perception of their health state during the pandemic.

We found that around three quarters of the university students reported bad sleep quality. Similar results were found in two other studies.^{4,26} The first, with adults and elderly Brazilians from all regions in the country, revealed that 43.5% reported sleep problems to have appeared, and 48.0% had a preexistent sleep problem worsen.⁴ The second, with doctors (average of 36 years of age) from 18 Brazilian states, showed that 73.1% of the participants reported a worsening of their sleep quality since the beginning of the pandemic.²⁶ Despite the sampling profiles cited above being different from the sample used in the present study, we can see that a worsened sleep quality due to the pandemic has affected several age groups and social strata.

In addition to that, sleep disturbances in university students may be related to increased levels of stress, anxiety, and depression. Sleep quality is known to be related also to the life habits of an individual, which were widely affected by the pandemic scenario. Moreover, financial tension, future uncertainties, fear of catching the disease, and loneliness are factors which may cause sleep to suffer alterations.^{4,7}

Financial difficulties may directly affect the psychological health of the students, since, according to data from a Brazilian study, the lack of supplies (food, water, and clothes) during the quarantine was associated with anxiety and frustration.² In the case of students, we must add to that an uncertainty in regards to the future, mainly due to the interruption of their classes and not knowing when activities would be resumed.²⁷

We found a high percentage of mood changes among the university students (stress, anxiety, and depression) during the pandemic. These results corroborate findings by other studies with university students in other countries.^{6,28} The first, comprised of two groups of Portuguese students with an average of 20.14 (± 1.65) and 20.4 (± 1.67) years of age, compared levels of stress, anxiety, and depression for both groups in the pre-pandemic period and during it, and found an increase in the levels of these parameters.²⁸ The second study, carried out with Chinese students (15-59 years old), showed that more than half of the participants suffered severe and moderate psychological alterations (53.8%), including stress, anxiety, and depression, during the pandemic.⁶

These mood changes may be related to social distancing during the quarantine, since a worsening in anxiety, stress, and depression may be caused by the absence of social interaction.²⁹ Furthermore, a study

carried out with students from the Medical School of Changzhi, mostly residents in the Hubei province (epicenter of COVID-19), in China,⁷ showed an association between economic imbalances and psychological disorders.

As this is a theme which is still scarce in the literature, comparative references are limited and, in many cases, fail to allow for comparisons with the same group, in this case, university students. Another limitation of this study is the period of data sampling, which may indicate different scenarios within the pandemic. In addition, as this was carried out in online questionnaire format, any further questioning of the answers was impossible.

We'd like to highlight as strengths of our study the fact that it makes an important contribution to the mapping of the socioeconomic conditions of Brazilian undergraduate students, due to the scarcity of studies which approach the association of financial difficulties in the COVID-19 pandemic with problems related to dietary conditions and state of health of this group, in addition to contributing with data for the creation of eventual public policies aiming to aid students and the population at large. Moreover, this study was advantageous for being able to reach a large number of participants at a low cost while respecting sanitary issues.

CONCLUSION

The findings in this study reveal that students who underwent financial difficulties during the Covid-19 pandemic presented higher percentages of INSAN, negative self-perception of health, bad sleep quality, depression, anxiety, and stress, when compared to those who did not suffer financial losses in the same period.

In addition, the impact of financial difficulties in the life of the students indicates there is a need for the creation of strategies which aim to provide financial and psychological assistance for this group. Lastly, this study contributes for the theoretical framework and the basis for future public policies at the government level.

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