Perception of mental health in higher education students: changes due to the COVID-19 pandemic

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ABSTRACT: The actual pandemic context took several changes in the routine of higher education students, including interruptions of face-to-face classes, implementation of education at a distance, interruption or delayed phases, and others, which could compromise mental health. This study aimed to assess the perception of mental health among higher education students in times of pandemic COVID-19 and associated factors. The sample was constituted of 1,004 higher education students, aged 18 to 51 years (20.33±3.35), 725 (72.2%) female. The instrument includes a questionnaire, elaborated by the researchers, divided into four parts: characterization social--demographic, physical exercise practice, feeding, and mental health. Before the confinement, 99 (9.9%) students classify their mental health as poor and during the confinement 423 (42.2%) said that their mental health was poor ($p \leq 0.001$). Women presented 1.91 (CI=1.42-2.56; $p \leq 0.001$) more probabilities of having poor mental health and the students that did not practice physical exercise during the confinement had 1.56 (CI=1.22-2.04; $p \leq 0.001$) more chances of having poor mental health. Most students classified their mental health as inferior during confinement due to the COVID-19 pandemic, with women and the lack of physical exercise being the factors that were most related to poor mental health.

Keywords: Mental health; COVID-19; Confinement; University students; Physical exercise; Feeding.

Saúde mental em estudantes do ensino superior: consequências da pandemia COVID-19

RESUMO: O atual contexto pandémico levou a diversas alterações na rotina dos estudantes de ensino superior, incluindo interrupções de aulas presenciais, implementação do ensino à distância, interrupção ou adiamento de estágios, entre outras, o que pode comprometer a saúde mental. O objetivo deste estudo foi avaliar a perceção da saúde mental em estudantes do ensino superior em tempos de pandemia COVID-19 e os fatores associados. A amostra foi constituída por 1.004 estudantes do ensino superior, com idades compreendidas entre os 18 e 51 anos (20,33±3,35), sendo 725 (72,2%) do sexo feminino. O instrumento incluiu um questionário, elaborado pelos investigadores, dividido em quatro partes: caracterização sócio-demográfica da população, prática de exercício físico, alimentação e saúde mental. Antes do confinamento, 99 (9,9%) estudantes classificaram a sua saúde mental como má e durante o confinamento 423 (42,2%) disseram que a sua saúde mental estava má ($p \leq 0,001$). As mulheres apresentaram 1,91 (IC=1,42-2,56; $p \leq 0,001$) mais probabilidades de ter uma má saúde mental e os estudantes que não praticaram exercício físico durante o confinamento tiveram 1,56 (IC=1,22-2,04; $p \leq 0,001$) mais chances de ter uma saúde mental de má qualidade. A maioria dos estudantes classificou a sua saúde mental como má durante o período de confinamento decorrente da pandemia COVID-19, sendo as mulheres e a ausência de prática de exercício físico os fatores que estiveram mais relacionados com a má saúde mental.

Palavras-chave: Saúde mental; COVID-19; Confinamento; Estudantes universitários; Exercício físico; Alimentação.

Introduction

The university entrance consists of an important period of transaction for the adult phase, involving new challenges[1-2], like increasing independence and consequent liability and the distance of the support networks[3]. Challenges can affect the mental health of academic students[1], and poor mental health can lead to low academic performance, from the raise of missing classes, and other factors[1].

In March 2021, Portugal was at a new phase of confinement because of COVID-19 where face-to-face classes were suspended[4]. This pandemic context further aggravates mental health[5-6], once the students have to adapt to new pedagogical approaches, such as online classes, being more isolated, not having a social life, and in some situations, a delay occurs on their academic path, once that some places are not accepting internship students and some character disciplines were delayed. As for the places that are accepting students, the fact that carrying out the internship, principally in the health department, where the contact with the patient is close, can generate fear of contagion and pass to their families[7-8].

The period of confinement forced individuals to stay at home in order to minimize the spread of COVID-19, and some behavioral habits were changed, namely physical activity practice and eating behaviors, which compromised mental health even more[9].

Hereupon, the objective of this study was to assess the perception of mental health of higher education students in times of the COVID-19 pandemic, as well as the associated factors, specifically the practice of physical activity and eating habits.

Methods

The nature of the present study was epidemiological and cross-sectional.

Population

The population of the study includes students that were attending a degree course in any Portuguese institution. In 2020, 396,909 students were enrolled in higher education in Portugal[10]. An estimated mean of poor mental health, with a prevalence of 50% reported in international studies[11-12], was used to determine the sample size, assuming an error margin of 5% with a 99% confidence interval (CI). From this approach, the minimum sample size was established in 663 students.

The criteria for the inclusion involved, cumulatively, students enrolled in the year 2020/2021, of either sex, with age equal to or older than 18 years old, and students who wanted to participate voluntarily in the study. The students attending other superior courses, such as postgraduate, master's degree, and doctorate were excluded.

Measure instrument

The instrument used for the collection of data included a questionnaire elaborated by investigators. The questionnaire was submitted for a pre-test in ten higher education students in the form of detecting any doubt and counting the duration of the filling.

The questionnaire was disseminated through social networks and text messaging applications and was completed online during the month of March 2021.

The questionnaire was divided into four parts: a description social-demographic of the population, practice of physical exercise with a frequency of a minimum of three times a week, before and during the confinement, feeding, and mental health.

The first part of the questionnaire included questions about gender, age, and, if at the time of filling out the questionnaire, the student was in confinement, having been defined as the fact of not leaving the house or going out only to make essential purchases, practice physical activity, walk with pets, carry out assessments and/or sporadic work.

In the second part of the questionnaire, the student was asked if practiced regular physical exercise before the confinement, with a frequency of at least three times a week, and if practicing at the time of filling out the questionnaire. The student who continues to exercise during confinement should refer to the practice way (online classes, autonomously, outdoors, with the use of applications, through the viewing of videos), and in case of the student has interrupted the practice of exercise should register the motive (was injured, lack of motivation, lack of time). On these questions, the student could choose more than one option. The student also was asked if, since the beginning of the pandemic, has changed the frequency of physical exercise, in case he has continued with his practice during confinement.

In the third part of the questionnaire, the student was questioned if he felt more desire to eat, if noticed a change in his/her body weight during the confinement period and if maintain, increase or decrease the number of daily meals during confinement.

In the last part of the questionnaire, the student was asked to classify his/her mental health as extremely poor, very poor, poor, excellent, very good, and good, before and during the confinement. In case the student presents changes in his/her mental health, it should register the factors that contributed to his/her mental health (financial issue, isolation/confinement, change in class typology (more online classes), interruption of physical activity, delay in academic career). On the next question, the student should point out the strategy or strategies used to preserve his/her mental health (talking to a family member/friend, consulting a psychologist or other health professional, practicing relaxation techniques, practicing physical activity, using medication). On these last questions, the student could select more than one option. For last, he/she was questioned if was accompanied by a psychologist before the pandemic, and in the negative case, if he/she feel the necessity to contact a psychologist during the pandemic.

Ethical considerations

The study was approved by the Research in Education and Community Invention (RECI), Piaget Institute research unity.

All participants were informed about the study objectives, being clarified of the anonymity of responses would be guaranteed and that they could give up at any time during the study. The students were also informed that they could withdraw from their participation in the study at any time, not suffering any kind of prejudice with this decision.

Data analysis

The statistical analysis was realized with the use of the Statistical Package for the Social Sciences (SPSS) software, version 26.0.

On a first approach, it was performed a descriptive statistic. For testing the dependent relation between variables and classifications of mental health before and during the confinement, the Chi-Square independent test was used, being the options of qualitative answers grouped into two categories: poor, including the extremely poor, very poor, and poor answers; and good that includes the excellent, very good and good answers.

The influence of variables included in the presence of poor mental health (classified as extremely poor, very poor, and poor) was evaluated by binary logistics regressions, based on the Enter method.

The statistical significance was established at 0.05.

Results

The sample was constituted of 1,004 higher education students (value higher than that defined for the stipulated sample), with ages between 18 and 51 years old (20.33±3.35), 725 (72.2%) female and 279 (27.8%) of the male sex.

At the moment of filling out the questionnaire, most of the students (914; 91.0%) fulfilled the confinement decree by the government, going out just for groceries, practicing physical exercise, walking pets, or doing some sporadic work.

Physical exercise

Before the confinement, 460 (45.8%) students referred to practicing physical exercise with regularity of minimum three times a week, and, during confinement, 435 (43.3%) kept this practice.

From the 435 (100%) students who continued practicing physical exercise, 300 (68.9%) increased the frequency of weekly practice, 58 (13.3%) lowed, and 77 (17.8%) maintained the same frequency.

The students that continued practicing the physical exercise during confinement replied on the way that they were doing the exercise, as 254 (29.4%) of the answers were practicing in an autonomous way, 222 (25.7%) practiced outdoors, 184 (21.3%) through videos, 114 (13.2%) by apps use and 77 (8.9%) by online classes. Of the students that stopped the exercises in this confinement (569; 56.7%), 601 (53%) of the answers were by the lack of motivation, 315 (27.8%) by lack of time, and 67 (5.9%) for being injured.

Feeding

As for body weight, 385 (38%) of the students did not refer to changes in their weight, 380 (37.8%) raised their weight, and 239 (23.8%) lower their weight.

Five hundred and seventy-five (57.3%) students revealed that they have more desire to eat and 429 (42.7%) did not have this symptom.

Regarding the number of daily meals, 550 (54.8%) students kept the same number of meals, 321 (32%) increased the number, and 133 (13.2%) decreased it.

Mental health

Table 1 presents the self-evaluation of the student relate to mental health before and during the period of the confinement decree because of the pandemic. Before the confinement, 99 (10.0%) students classified their mental health as poor (sum of the poor, very poor, and extremely poor answers), and, during the confinement, this number increased to 423 (42.2%) ($p \leq 0.001$).

According to the responses provided by students who showed changes in their mental health, the factors that contributed to the impairment of mental health were (2,042 responses): confinement/isolation with 788 (38.6%) responses, change in the typology of the face-to-face classes for online classes with 585 (28.7%) answers, the delay in the

Table 1. Self-classification of mental health before and during confinement

Confinement period	Self-classification of mental health					
	Extremely poor	Very poor	Poor	Good	Very good	Excellent
Before	11 (1.2%)	14 (1.4%)	74 (7.4%)	378 (37.6%)	397 (39.5%)	130 (12.9%)
During	39 (3.8%)	105 (10.5%)	279 (27.8%)	454 (45.2%)	101 (10.1%)	26 (2.6%)

academic path with 266 (13.0%) answers, the interruption of physical activity with 258 (12.6%) answers, and financial question with 145 (7.1%) answers.

Regarding the strategies used to preserve their mental health (1,621 responses), 573 (35.7%) responses were that the students spoke to a family member or friend, 425 (26.2%) responses were physical exercise practice, 245 (15.1%) practiced relaxation techniques, 162 (9.9%) did not use any strategy, 91 (5.6%) used medication, and 89 (5.5%) spoke to a psychologist or other health professional.

Sixty-four (6.4%) students were accompanied by a psychologist before the pandemic and 269 (26.8%) students felt the need of contacting this professional during the pandemic.

Table 2 presents the data obtained in relation to the poor classification of mental health and some variables analyzed in the study. The results obtained indicated a greater probability of developing poor mental health in female students (1.91 more chances compared to male students) and in those who did not practice physical exercise on a regular basis during the confinement period (1.56 more chances compared to those who practiced).

Table 2. Relationship between poor mental health and the variables analyzed in the study

Variables	$Oddsratio_{crude}$ (CI 95%); *p*-value
Gender (male*) female	1.91 (1.42-2.56); 0.001
Age group (≥ 25 years old*) until 25 years old	1.73 (0.93-3.21); 0.082
Practice of physical exercise during confinement (yes*) no	1.56 (1.22-2.04); 0.001
Increased appetite to eat (no*) yes	1.05 (0.81-1.35); 0.723

* Class reference

Discussion

The pandemic COVID-19 obliged the world population to live a new reality that includes the obligation of social isolation that can be contributed to changes in the mental health of the students[13].

During this study, most of the students inquired were in confinement due to a raise in cases and because of the mortality of the virus COVID-19 in Portugal. The higher education institutions had to adapt again to this reality and take measures to delay practical classes and internships, compromising the curricular year.

Before the confinement, 90% of the students classified their mental health as good (included good, very good, and excellent answers) and only 10% of the students classified their mental health as poor (included poor, very poor, and extremely poor answers). During this new confinement phase decree by the Portuguese government, this panorama changed abruptly, being that 58% of the students reported that their mental health was good and 42% referred that were poor, increasing 30% the students that worsen their mental health.

This result appears to be consistent with the results of other studies carried out with university students from other countries. Ma et al.[11] evaluated the mental health problems in 746,217 Chinese university students during the outbreak of COVID-19 in China and checked that 45% of the participants had mental problems, 35% presented acute stress, 21% depression, and 11% anxiety. Teixeira et al.[12] evaluated 656 students in the Medicine course in Brazil during the confinement, and the results revealed that 63% of the students presented indications of psychological distress and 81.4% of participants reported having seen some type of psychological or behavioral change during confinement. Elmer et al.[14] also found that Swiss students' levels of stress, anxiety, loneliness, and depressive symptoms worsened.

Divergent data were presented in the study by Amaral-Prado et al.[15] who analyzed a sample of 1,135 Brazilian university students and found no significant differences in perceived stress, depressive signs, and resilience before and during the pandemic.

Most of the responses obtained revealed that the factors that most contributed to the worsening of mental health were confinement and distance classes (online). Social support is a strong and consistent predictor of health outcomes, being related to mental health[16] and social isolation is associated with an increased risk of premature mortality and morbidity from chronic diseases[17].

Several studies have proven a beneficial relationship between the practice of physical exercise and the improvement of humor, self-esteem, vitality, well-being, and decrease of depression and anxiety symptoms. The benefits caused by the practices of exercises can be assigned to the increase of synaptic transmission of monoamines and/or increased release of endogenous opioids (endorphins)[18-19]. Although there was a decrease of only 2.5% of students who stopped exercising regularly during confinement, the data of our study showed an increase in the likelihood of having a

low level of mental health in students who did not practice regular exercise, confirming the benefits of this practice for maintaining good mental health[6,20]. The lack of motivation was the factor obtained in this study that most contributed to the interruption of physical exercise, generating a vicious circle since physical inactivity can compromise mental health.

Olfert et al.[9] evaluated 2,018 university students at Appalachia University, USA, between March and April 2020 and the results showed that the number of students engaging in low physical activity increased by 24% and the number of students engaging in high physical activity decreased by 25.5% and many students performed their exercise at home.

Our data showed that most students revealed that they have more desire to eat during the lockdown and 38% had weight gain, data similar to those found in the study. Olfert et al.[9] that showed that 33% of American students reported eating somewhat more since COVID-19. Other studies reported that consumption has increased by 46% and 43% in an Italian[21] and Polish[22] sample, respectively. Although no statistical significance was found between increased appetite and poor mental health in our study, in Olfert et al.[9] study, of the students who referred to eating somewhat more or a lot more, 38.8% and 67.9% reported it was due to stress and boredom, respectively.

Women were also more likely to have poor mental health compared to men. Similar data were obtained in the study by Amaral-Prado et al.[15] in which men had lower scores for perceived stress and depression when compared to women, and those found in the study by Elmer et al.[14] who found that women revealed the increased likelihood of anxiety, depression, stress, and loneliness.

This study has as limitations the non-validation of the measurement instrument, obtaining results based on students' self-reports, not having been evaluated by a health professional, and the lack of data collection in the period before confinement.

Conclusions

Data from our study revealed that most of the students in this analyzed sample classified their mental health as poor during confinement due to the COVID-19 pandemic, and the factors that most related to poor mental health were being women and the lack of physical exercise.

This study suggests the importance of monitoring the member's mental health at higher education schools, especially in times of pandemic, in the search for policies that aim to improve the resilience of the population and seek positive and effective coping strategies in the university environment.

The practice of physical exercise seems to be a factor that can contribute to better mental health, and strategies must be created to encourage its practice, in addition to creating conditions for it within the school environment itself.

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Conflict of interests

No conflicts to declare.

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