

Perceived stress in the context of social distancing against COVID-19 in medical students of Espírito Santo state

O estresse percebido no contexto de distanciamento social pela COVID-19 em estudantes de medicina do Espírito Santo

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ABSTRACT: *Introduction:* Medical students usually live with the exhausting curriculum load and mental overload, as they are considered a risk group for stress-related diseases such as depression, insomnia, and anxiety. The COVID-19 pandemic in 2020 demanded the imposition of new social and educational adaptations, implying a scenario of stressful situations. Thus, perceived stress can be observed in how these students reacted to demands and distractions outside the student environment. *Objective:* Evaluate the prevalence of perceived stress in medical students in the state of Espírito Santo and the impact of social distancing due to COVID-19, and disclose data for promoting intervention measures. *Methods:* Descriptive and quantitative cross-sectional study composed of an online self-assessment questionnaire based on sociodemographic characteristics, student conditions during the social distancing period, and Perceived Stress Scale (PSS-10). *Results:* The sample of this study consisted of 137 students, and the stress prevalence was equal to 21.2% (N=29), and of the total sample, 68.6% (N=94) is female. Regarding the stress correlated variables, more female students were observed to suffer from stress and those who do not practice physical activity regularly. Concern for the post-pandemic academic scenario and the onset of stress are also statistically related. *Conclusion:* A higher prevalence of stress was observed among women. Additionally, habits such as physical activity, religiosity, and living in family residence were considered protective factors for coping with stress.

Keywords: Quality of life; Students, medical; COVID-19; Stress; Mental health.

RESUMO: *Introdução:* Estudantes de medicina normalmente convivem com uma carga curricular exaustiva e sobrecarga mental, sendo considerados grupo de risco para doenças relacionadas ao estresse como depressão, insônia e ansiedade. Com o advento da pandemia de COVID-19 no ano de 2020, novas adaptações sociais e educacionais foram impostas, implicando em um cenário de situações estressantes. Desse modo, o estresse percebido pode ser observado na maneira que esse público reagiu junto às cobranças e às distrações fora do ambiente estudantil. *Objetivo:* Avaliar a prevalência do estresse em estudantes de medicina do estado do Espírito Santo como impacto do distanciamento social pela pandemia da COVID-19, além de divulgar os dados para a promoção de medidas de intervenção. *Métodos:* Estudo descritivo e quantitativo de caráter transversal composto por um questionário autoavaliativo online, composto por características sociodemográficas, condições do aluno no período do distanciamento social e a Escala de Estresse Percebido (PSS-10). *Resultados:* A amostra deste estudo foi constituída por 137 estudantes, sendo que a prevalência de estresse foi igual a 21,2% (N=29), e do total da amostra 68,6% (N=94) são do gênero feminino. Em relação as variáveis correlacionadas ao estresse, observou-se que alunos que apresentavam estresse pertencem mais ao sexo feminino e não praticam atividade física regularmente. A preocupação com o cenário acadêmico pós-pandêmico e o surgimento do estresse também estão estatisticamente relacionados. *Conclusão:* Foi constatado uma maior prevalência de estresse entre as mulheres. Além disso, hábitos como prática de atividade física e religiosidade, bem como morar em residência familiar foram considerados fatores protetores para o enfrentamento do estresse.

Palavras-chave: Qualidade de vida; Estudantes de medicina; COVID-19; Estresse; Saúde mental.

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INTRODUCTION

Coronavirus (COVID-19) became a great concern to the World Health Organization (WHO) due to its lethality and rapid dissemination throughout the world in 2020. The first cases were registered in Brazil at the beginning of February and rapidly evolved into a disease characterized as a pandemic in the following month^{1,2}. Thus, containment and social isolation measures were established, which consisted of reducing interactions with the community and limiting the circulation of people, seeking to decrease the spread of the disease and the crisis within the healthcare system^{3,4}.

Diverse studies were performed in 2020 by college students who found multiple psychosocial factors related to the COVID-19 pandemic. Stress, anxiety, and depression were among the main significant symptom indexes. Those symptoms can be exacerbated by excessive media exposure, worries about concluding the course, preexisting mental disorders, and a low degree of social-family support⁴⁻¹⁰.

The respective student public is also considered as a risk group for these disorders, even more intensely in Medical course students, who are vulnerable to mental illnesses due to their intense exposure to extenuating schedule loads, chronic stress, sleep deprivation, reduced leisure time, as well as their high degree of responsibility and commitment¹¹⁻¹².

Such conditions are stress predictors, originating from situations where the individual feels indeed or imaginarily threatened. That context interferes with physiological and cognitive functions, affecting the personal life and performance of their future professional practices and being subjected to intrinsic factors, such as personality and the repertory of coping strategies. Current exposure to these conditions facilitates the emergence of these disorders¹¹⁻¹³.

Thus, this study emphasizes the evaluation of the predominance of stress perceived by medical students in the state of Espírito Santo during the COVID-19 pandemic, focusing on social distancing as the main predominant factor, considering the studied individuals who were part of a group precociously exposed to mental and physical overloads. Furthermore, the research has also intended to disclose data for promoting measures, as a program for the prevention and protection of mental health, by Higher Education Institutions and public policies to reduce the prevalence of perceived stress and improve students' quality of life.

METHOD

This descriptive and quantitative transversal study included students who were adequately enrolled in the medical course, from the first to the twelfth semester, in public and private colleges in the state of Espírito Santo.

The exclusion criteria were students from other courses or medical students from other Brazilian states.

The research exposed participants to minimal risks, as discomfort while answering questions for the procedure and the time it took for filling out the forms. Thus, the participant could immediately interrupt the research study, and their personal data were not stored in the research study database. The research also ran the risk of data leakage as it was an online form; therefore, to minimize that problem, a strong password-protected email was created to protect and keep the account safe, and we also used antivirus applications.

The research was approved by the Ethics Committee opinion # 4.282.009, by the Ethics and Research Committee on Human Beings at "Universidade Vila Velha" (Vila Velha University) - ES/UVV. The Free and Informed Consent Term (FICT) was included at the beginning of the online questionnaire, preceded by the questions for data collection; after that, the participants would be granted access to accept the described terms afterward.

The study was based on applying the self-evaluation questionnaire through the online *Google Forms* platform. The evaluation was available during the social distancing period, observing the presence of perceived stress based on the context of the COVID-19 pandemic.

Colleges from different municipalities in the state of Espírito Santo were included in this study, in Vila Velha, Vitória, and Colatina. There was total participation from one public and four private Higher Education Institutions in the study. The invitation for participating in the study occurred by getting in touch with existing academic bodies in institutions teaching the medical course in that state, being disclosed to all students who were adequately enrolled in the institutions, by emails, and educational, social network media. 137 students participated in the study as the participation was voluntary and considered the exclusion and inclusion criteria.

The questionnaire was divided into three parts; the first part was composed of sociodemographic and academic data, as gender, age, religion, leisure activity, residing with the family or student/individual housing, previous education and/or professional experience, and if the student had already considered dropping out of the course. The second part is related to the student's conditions during the social distancing period, involving their family relationships, amount of news exposure, the occurrence or not of online classes at their own college, their ability to concentrate, the relationship of interest in their studies, physical and mental tiredness, the difficulty of complying with targets and worrying and anxiety present in the academic scenario after the pandemic. Both parts were composed of questions with general and subjective answers, whereas each student considered their unique and specific context.

And, finally, the third part of the research was based

on the Perceived Stress Scale (PSS-10), composed of 10 items. That is a reduced version as the original scale is made up of 14 items (PSS-14)¹⁴ but has strong psychometric qualities, and it is capable of evaluating perceived stress without missing anything¹⁵. The Portuguese translation from English “Escala de Estresse Percebido” was validated by Brazilian university studies^{16,17}.

PSS-10 is composed of six questions on negative aspects (1, 2, 3, 6, 9, and 10), answered by a Likert 5-point scale: 0 (never), 1 (almost never), 2 (sometimes), 3 (almost always), and 4 (always). And four questions on positive aspects (4, 5, 7, and 8), answered by inverted score values, as 0 (always), 1 (almost always), 2 (sometimes), 3 (almost never), and 4 (never). The totaled score ranges from 0 to 40. High-stress levels are observed when values are over 30 points (75%) of the total individual score¹⁷.

After the data had been collected, the results were tabulated and analyzed. Statistical analysis was performed in a database prepared in Microsoft Excel for Windows and the IBP® SSP® Statistics program, version 26. The average point scores from PSS-10 were adequately calculated based on these, evaluating if there was perceived stress at

restrictive measures¹⁸. The prevalence of individual stress was also calculated and intersected with sociodemographic data to apply the correlation of the most important variables and display scientific interest.

RESULTS

The sample was made up of 137 medical course students from Espírito Santo colleges. The following was observed regarding sociodemographic and academic data, the majority of the sample was female (68.6%, n=94) and ranged from 20 to 25 years old (75.2%, n=103). The most represented institution was the “Universidade Vila Velha” (Vila Velha University) 47.4% of the answers were from there (n=65). The highest index of replies on religiosity was from Christian people (73%, n= 100). The majority of the people practiced physical activities; however, it was noted that 13.1% (n=18) completely interrupted their physical activities due to social isolation. Most of the students live in family surroundings (76.6%, n=105), and the majority (86.9%, n=119) had never had any other professional experience besides medicine (Table 1).

Table 1 - Sociodemographic and academic factors affecting Medicine students at Espírito Santo institutions during the COVID-19 pandemic

Variables		N	%
Gender	Female	94	68.6
	Male	43	31.3
Age	< 20 years old	14	10.22
	> 30 years old	6	4.38
	From 20 to 25 years old	103	75.18
	From 26 to 30 years old	14	10.22
Institution	EMESCAM	39	28.47
	MULTIVIX	2	1.46
	UFES	12	8.76
	UNESC	17	12.41
	UVV	65	47.45
Religion	Atheist	1	0.73
	Christian	100	72.99
	Spiritism	2	1.46
	Not religious	33	24.09
	Umbanda	1	0.73
Practices physical activity?	Yes	67	48.91
	Decreased frequency*	39	28.47
	Completely stopped*	18	13.14
	No	13	9.49
Housing location	Student/collective	14	10.22
	Family	105	76.64
	Individual	18	13.14
Has other professional experience?	Yes	18	13.14
	No	119	86.86

* During social isolation

The students' conditions during social isolation are shown in Table 2, whereas a good family relationship proved to be a protective factor against stress (OR=0.114; CI 95% 0.045-0.285; p=0.040). There was no other academic factor that was significantly associated with stress. However, there was a great trend observed related to physical and mental tiredness during the pandemic de 92.6% (n=127) among the

interviewed students, over half of them (65%, n=89) who were not able to adequately concentrate on their studies (OR=1.296; CI 95% 1.179-1.425; p= 0.089). It was also confirmed that 82.5% (n=113) of the students were worried about the post-pandemic academic scenario (OR=7.57; CI 95% 0.97-58.68; p=0.025).

Table 2 - Conditions of the student during the social isolation related to the emergence of stress by medicine college students in Espírito Santo during the COVID-19 pandemic

Variável	Stressed		Without stress		p
	N	%	N	%	
Concern regarding the academic scenario					
Yes	28	20.5%	85	62.0%	0.02
No	1	0.7%	23	16.8%	
Interest in studies					
Yes	9	6.7%	65	47.4%	0.11
No	20	14.6%	43	31.3%	
Thought about dropping out of the course					
Yes	13	9.5%	69	50.5%	0.23
No	16	11.6%	39	28.4%	
Displayed physical or mental tiredness					
Yes	29	21.2%	98	71.5%	0.09
No	0	0.0%	10	7.3%	
Good concentration and capable of complying with targets					
Yes	1	0.7%	85	62.0%	0.07
No	28	20.4%	23	16.9%	
Good family relationships					
Yes	25	18.2%	104	75.9%	0.04
No	4	2.9%	4	2.9%	
Considers the quantity of news is excessive					
Yes	23	16.8%	71	51.8%	0.16
No	6	4.4%	37	27.0%	
E-learning was implemented at their college					
Yes	28	20.5%	105	76.6%	0.96
No	1	0.7%	3	2.2%	

Source: Research study form

Considering the score was greater or equal to 30 on the PSS-10 scale (Table 3), the stress prevalence in the studied sample was 21.2% (n=29). The participants of the groups were classified in intervals of 10, 4.4% (n=6) of the students in the answering group were confirmed of scores ranging from 1 to 9, 27.0% (n=37) in the group from 10 to 19, and 47.4% (n=65) in the group from 20 to 29.

Table 4 displays the data analyzing the occurrence of

stress based on gender; 68.6% of the female students were observed (n=94) as showing some symptoms. The majority of students reported that they lived with their families (76.6%, n=105), and over half of them were religious (75.1%, n=103). Since, regarding physical activities, 77.4% (n=106) answered that they practiced them regularly, 28.4% (n=39) decreased the frequency of their activities considerably after the pandemic began.

Table 3 - Questions on PSS-10 form for the Medicine College students in Espírito Santo during the COVID-19 pandemic

Questions	Frequency				
	Very frequent	Sometimes	Rarely	Almost never	Never
Did the student became upset because of some thing that happened unexpectedly?	28.47%	15.34%	45.26%	10.95%	0.00%
Did the student feel incapable of controlling important things in their life?	37.96%	13.87%	38.00%	9.49%	1.46%
Was the student nervous or stressed?	42.34%	17.52%	30.66%	9.49%	0.00%
Was the student confident of their ability to deal with their personal problems?	22.63%	23.81%	36.50%		0.73%
Did the student feel like things happened to them unexpectedly?	10.22%	16.79%	45.99%	21.90%	5.11%
Did the student think they were not able to deal with all the things they had to do?	41.61%	13.87%	34.31%	9.49%	0.07%
Could he/she control all the irritations in his/her life?	21.90%	19.71%	45.99%	10.95%	1.46%
Did the student feel like all the aspects in their life were under control?	8.02%	22.63%	28.47%	30.66%	10.22%
Was the student angry because of the things that were out of their control?	45.99%	19.71%	45.99%	10.95%	1.46%
Did the student feel like problems were accumulating so that they could not solve them?	34.31%	13.87%	29.93%	16.06%	5.84%

Source: PSS-10 form from this study

We verified the related stressing factors and their results in the PSS-10 program. The Student *t*-Test was performed to verify the statistical significance of the uncovered correlations and calculate the effect measures, seeking to increase the precision in the related variables. Table 4 shows the comparison of the sociodemographic

variables among universities regarding stress or no stress. The following was observed for significant differences related to gender and practicing physical activities; thus, the female gender was (OR=0.283; CI 0.092-0.873; $p=0.049$) or those who did not practice any physical activity, said stress emerged (OR=0.372; CI 0.152-0.909; $p=0.021$).

Table 4 - Relationship between stress and sociodemographic factors in medicine students at Espírito Santo colleges during the COVID-19 pandemic

Variable	Stressed		Without stress		P
	N	%	N	%	
Gender					
Female	25	18.2%	69	50.4%	0.05
Male	5	6.2%	38	27.8%	
Practices physical exercises					
Yes	18	13.1%	88	64.2%	0.02
No	11	8.00%	20	14.7%	
Housing					
Student	1	0.7%	13	9.5%	0.06
Family	27	19.7%	78	56.9%	
Individual	1	0.7%	17	12.5%]	
Practices a Religion					
Yes	22	16.1%	81	59.1%	0.92
No	7	5.1%	27	19.7%	

Source: PSS-10 form from this study.

DISCUSSION

We observed 21.2% (n=29) an overall prevalence of stress in the sample when analyzing the proposed characteristics observed in our research study, that is, among men and women who experienced some type of emotional impact during the COVID-19 social distancing period.

There was a predominance of stress among the female gender participants of 18.2% (n=25), a result similar to what was found in the literature^{10,11,19}. In many cultures, women are faced with diverse tasks requiring them to conciliate their professional role to their studies and domestic duties and often family responsibilities¹⁹. Moreover, stress can be related to uncertainties regarding socioeconomic issues and the excess of media information and fake news²⁰, as was reported by the majority of students (68.3%, n=94) during social isolation.

We confirmed that people who practice physical exercise displayed lower anxiety indexes, as 75.2% (n=88) of the sample. Regarding this, the bibliography demonstrated that physical activity contributes to improving intellectual abilities and enhances students' moods, motivation, and self-esteem²¹.

Stress protection and mental health factors have also been observed in the literature, as living with families and practicing some religion have been demonstrated respectively as, 77.4% (n=106) and 84.2% (n=103) among students²²⁻²⁴. That protection can be justified by the support family connections provide in facing stress provoked by daily difficulties²². Besides that, in the current scenario, religion acts as a social determinant of health, as belief relates and contributes to the adhesion of coping strategies^{23,24}.

The results based on the applied PSS-10 scale, related to the concerns and interests being studied, were inconsistent. The majority of people confirmed that they were worried about the scenario, 62.0% (n=85), and did not display traces of stress.

Despite these data, the research points out there is a high rate of worrying among 82.5% (n=113) of the students related to the academic scenario, apart from the presence of stress. This can be associated with physical or mental tiredness and interfering with concentration, evidenced, respectively, by 92.7% (n=127) and 37.3% (n=51) of the interviewed subjects. The concern with the accumulation of subjects after returning to face-to-face classes and the loss or delay of semesters was also presented as having a close link to mental illness, especially among medical students¹¹.

The results have shown that social isolation has brought about uncertainties annoying by facing unforeseen situations "very frequent" in 28.5% (n=39) of the interviewed subjects, and the majority, 41.6% (n=57), reported that they were not able to perform their scheduled

tasks. Furthermore, the participants confirmed they could notice that problems were accumulating in 34.3% (n=47) of the cases, while 48.2% (n=66) declared they could not handle critical situations in their lives. That absence of control can trigger a feeling of "very frequent" anger in 46% (n=43), as well as nervousness or stress in 42.3% (n=58) and making it challenging to handle irritation in 41.6% (n=57).

Stress was noted to contribute to increased sicknesses throughout the pandemic.

Thus, 22.6% (n=40) of the students confirmed being confident of dealing with their problems, and 8% (n=11) of them revealed being capable of controlling different aspects of their lives. However, the epidemiological findings proved the involvement of stress experienced in the pandemic and social isolation.

There have been some limitations presented in this study, such as the composition of the sample integrated as volunteers and internet access, indicating that this can be less related to the population in general and doubts that cannot be clarified while filling out the answers. Besides that, some questions converge on subjectivity, which means they expand the possibilities of interpretations, limiting the precision of answers. The research was limited to one state in Brazil, where there are more private higher education institutions than public, as that can influence different contexts of each student and, due to that, the results cannot be generalized. However, it is possible to find similar results in other colleges in the country. Thus, it is worthwhile to invest more studies on the subject proposed in this document.

Although almost all the students continued in E-learning studies, 76.6% did not display signs of stress. The individuals who were studied are currently in different semesters of the medical course, making it necessary to carry out more research studies related to each semester's particularities and practical activities and stages of the pandemic.

Shortly, this research will contribute, so there will be an increased focus on students' mental health and after the pandemic, considering the specificities of each group in their care to minimize the possible harmful effects to their health.

CONCLUSION

The COVID-19 pandemic has generated a parallel of fear, anxiety, depression, and stress among the entire world population, focusing on Medical course students who are susceptible to mental illness.

The data analysis in this study has shown an increased stress rate among the studied population, especially among the female public. Resources for coping were also observed, including practicing physical activities,

practicing a religion, or residing with family members.

Practicing physical and leisure activities were proposed as alternatives for minimizing the impacts of stress in seeking social support and reducing news exposure

to content on COVID-19. Psychological support for students by higher education institutions has been proven as a mode for early intervention. Besides that, it is necessary to promote public policies on mental illness prevention programs for this group.

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