Mental health evaluation in medical students during academic activity suspension in the pandemic

Avaliação da saúde mental em estudantes de Medicina durante suspensão das atividades acadêmicas na pandemia

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ABSTRACT

Introduction: During the Sars-CoV-2 pandemic, social distancing measures and various other stress factors may have been responsible for impacts on medical students' mental health.

Objective: The purpose of this study is to describe the mental health status of medical students at a college in northeastern Brazil, in the context of the COVID-19 pandemic, investigate symptoms of anxiety and depression, and assess resilience, as well as its possible associated factors.

Methodology: A cross-sectional qualitative and quantitative method was used. Data were collected using an online questionnaire among students enrolled in the medical school; data were further processed using quantitative and qualitative statistical analysis separately. The following scales were applied: Generalized Anxiety Disorder Screener (GAD-7), Patient Health Questionnaire-9 (PHQ-9), and Wagnild and Young's Resilience Scale (RS-25).

Results: About one-third of the students lived with moderate or severe anxiety symptoms, almost half had moderate to severe depressive symptoms, and more than half were classified as having low or moderately low resilience.

Conclusion: Our findings highlight the difficulty in maintaining high levels of resilience and that the presence of depression or anxiety would be related to lower resilience scores in medical students during remote education. Further studies are needed to establish a causal link with the pandemic.

Keywords: Patient Health Questionnaire; Covid-19; Resilience, Psychological; Students, Medical

RESUMO

Introdução: Durante a pandemia de Sars-CoV-2, medidas de distanciamento social e vários outros fatores de estresse foram responsáveis por impactos na saúde mental dos estudantes de Medicina.

Objetivo: Este estudo teve como objetivos descrever o estado de saúde mental de estudantes de Medicina de uma faculdade do Nordeste brasileiro, no contexto da pandemia de Covid-19, investigar sintomas de ansiedade e depressão, e avaliar a resiliência e fatores associados.

Método: Utilizou-se um método qualitativo e quantitativo transversal. Coletaram-se os dados por meio de questionário on-line aplicado a alunos matriculados na Faculdade de Medicina. Em seguida, os dados foram processados separadamente por meio de análises estatísticas quantitativa e qualitativa. Adotaram-se os seguintes instrumentos: Generalized Anxiety Disorder Screener (GAD-7), Patient Health Questionnaire-9 (PHQ-9) e Wagnild e Young's Resilience Scale (RS-25).

Resultado: Cerca de um terço dos estudantes convivia com sintomas moderados ou graves de ansiedade, quase metade apresentava sintomas depressivos de moderados a graves, e mais da metade foi classificada como tendo resiliência baixa ou moderadamente baixa.

Conclusão: Nossos achados destacaram que houve dificuldade em manter altos níveis de resiliência e que a presença de depressão ou ansiedade estaria relacionada a menores escores de resiliência em estudantes de Medicina durante o ensino a distância. Mais estudos são necessários para estabelecer um nexo de causalidade com a pandemia.

Palavras-chave: Questionário de Saúde do Paciente; Covid-19; Resiliência Psicológica; Estudantes de Medicina.

INTRODUCTION

In December 2019, the first cases of Covid-19 were detected in the city of Wuhan in China, and the disease quickly became a worldwide concern, leading to the declaration of a pandemic state by the World Health Organization in March 2020[1]. With the subsequent application of social distancing measures, medical educators faced the dilemma of how to circumvent the problem of the lack of face-to-face activities and maintain a commitment to the technical and ethical training of their future professionals[2]. Brazil, as well as other countries, established the suspension of curricular internships, and, according to the specificities of each institution, remote teaching activities were implemented[3,4]. Following the recommendation of higher health agencies, academic activities at the Bahia School of Medicine of the Federal University of Bahia (FMB-UFBA) were interrupted, both for the 1st to 8th semesters, in March 17, 2020, and for the internship (9th to 12th semesters), in March 18, 2020.

The pandemic also brought challenges related to student mental health, which has been a concern for higher education institutions (HEIs) around the world[5,6]. The mental health impacts of the pandemic on students during quarantine involve higher numbers of cases of anxiety disorders and depression, as well as stress[7,8]. This conjuncture may have been caused by stressful events, such as the increase in the number of cases of COVID-19, the perception of uncertainty in the face of the pandemic, the adaptation to the remote teaching model, and the likely unfavorable impacts the pandemic would cause on their academic trajectories[9], as well as the excessive use of social media - and access to a lot of information about the pandemic - and the feeling of loneliness caused by social isolation[7]. Considering that medical students already represented a group with a high incidence of anxious and depressive conditions before the Covid-19 pandemic[10,11], the concern about how pandemic-related stressors would affect them would be even greater.

The concept of resilience can be defined in the literature as the ability to adapt in the face of adversity and stressors, resulting in adaptation with the least possible negative impact[12,13]. This characteristic is affected by the individual's internal resources, such as the ability to control their emotions and the efficiency of their communication; lifestyle, such as work-life balance and healthy amounts of quality free time; external resources such as the ability to ask for and receive support from others, and good social support; in addition to the active mediation of other agents, with teaching and training to build resilience in students being carried out by the educational institution itself [13]. Resilience is shown as the ability to regain balance after encountering difficulties[14]. It allows the individual's recovery from experienced adverse circumstances

through positivity and emotional skills and adapting and evolving during the process[15]. Therefore, resilience would in itself be a very helpful skill for medical students, although a Canadian study has shown that this population has lower levels of resilience than their age- and gender-matched peers in the general population[16].

Therefore, this study aims to analyze and describe the mental health of medical students at the Federal University of Bahia (UFBA) in the context of the COVID-19 pandemic, the suspension of curricular activities, and the uncertainty regarding the deadline for the resumption of in-person classes and its implementation format.

METHODOLOGY

This is a cross-sectional, qualitative and quantitative study, whose data were collected through an online questionnaire, applied between July and August 2020, to a convenience sample. This work is part of a larger research project that yielded another study about the hidden curriculum during this period and it is currently in the process of publication. The umbrella project was approved by the Research Ethics Committee of Faculdade de Medicina da Bahia (FMB), UFBA, under the Certificate of Ethical Appraisal Submission (CAAE - *Certificado de Apresentação de Apreciação Ética*) n. 33225020.1.0000.5577.

The inclusion criteria were: being a medical student attending from the 2nd to the 12th semesters of the FMB-UFBA, located on the campus of Salvador - Bahia, with the name on the enrollment list of the undergraduate medical course; having completed at least 1 period of the FMB-UFBA curricular grid; being at least 18 years old. The exclusion criteria were: refusal to sign the Informed Consent Form; refusal to fill out all the multiple-choice questions on the electronic form and being in a current situation of enrollment withdrawal or total leave of absence of curricular components. The questionnaires were sent to all students attending from the 2nd to 12th semesters via e-mail and WhatsApp®.

The collected variables included sociodemographic profile (gender, color/ethnicity, average family income), academic status (current semester/class and graduation delays), study habits, subjects studied during the period of academic activity suspension and opinion about the remote teaching model, as well as perceptions about the graduation progress and the government programs *Telecoronavírus* and *Brasil Conta Comigo - Acadêmico*. These perceptions were evaluated using Likert-type scales, in which the responses to the statements included: "strongly disagree" (1), "disagree" (2), "neither agree nor disagree" (3), "agree" (4), or "strongly agree" (5).

To provide an overview of the students' mental health status during the COVID-19 pandemic, the following scales were

applied: Generalized Anxiety Disorder Screener (GAD-7), Patient Health Questionnaire-9 (PHQ-9), and Wagnild and Young's Resilience Scale (RS-25). The GAD-7 is validated for diagnosing or screening patients with probable anxiety disorder, with 7 questions whose answers range from 0 (never) to 3 (most days), with a result greater than 10 suggesting the diagnosis of some anxiety disorder[17]. The PHQ-9 is used to screen for depression and contains 9 questions about depressive symptoms, with answers between 0 (never) and 3 (most days), with the following depression classifications: severe (20 or more points), moderately severe (15-19 points), moderate (10-14 points), mild (5-9 points), and minimal (<5 points)[18]. The Wagnild and Young Resilience scale measures the degree of resilience using 5 components as its basis, assessed through 25 questions, with answers ranging from 1 (strongly disagree) to 7 (strongly agree)[19]; and the following classifications were adopted: high (>145 points), moderate (125 to 145 points), moderately low (120 to 124 points), and low (<120 points).

The questionnaire was applied through the Google Forms online platform and the statistical analysis of the data was carried out using the IBM SPSS (Statistical Package for the Social Science) Statistics software, version 20. Regarding the quantitative variables, normality was verified using the Shapiro-Wilk test. In case of the absence of distribution normality, the selected variables were described according to their measurement level, with the calculation of median and interquartile range. In the case of qualitative variables, the frequency of these variables was calculated and the Fisher's Exact Test was performed to verify the independence of groups. The significance level adopted was 5%.

Since this is a study that used an online form as a data collection method, there is the risk of selection bias, either due to a lack of access to the technology or the possibility of attracting students who are somehow concerned about their mental health. The students' enrollment numbers were checked, decreasing the risk of imputing false or duplicate data.

RESULTS

There were 314 responses to the questionnaire, with three duplicate responses and one irregular enrollment, which were excluded, resulting in 310 eligible responses to the study, among the approximately 880 students attending from the 2nd to 12th semesters.

Regarding the sociodemographic profile (Table 1), 178 (57.4%) students were female, with a mostly urban place of residence (95.8%). One hundred and forty-two (45.8%) students identified themselves as light-skinned[1]. Ninety-seven participants had a family income between 1 and 3 minimum wages (MW), being the main income group (31.3%), while

13 (4.2%) had an income below one MW and 33 (10.6%) had an income above 15 MW. Fifty-one (16.5%) participants experienced some delay in the course progression.

Remote Education

Of the participants, 269 (86.8%) reported having the necessary tools for an adequate remote teaching-learning process (stable internet access, adequate and quiet space for studying) and 251 (81%) were in favor of the adoption of the remote model by UFBA during the pandemic.

As for the reasons for being in favor of adopting the remote model (Table 2), 216 of the 251 students who chose the remote model (86.1%, median=5, IQR=1) agreed or totally agreed with the desire not to delay the course. About the desire to advance, at least regarding the theoretical subjects, so that the course would not be so overloaded when returning to face-to-face classes, the agreement was 243/251 (96.1%, median=5 IQR=0) and, about the need to incorporate the new teaching technologies, the agreement was 173/251 (68.9%, 4±2).

As for the reasons for being against remote education (Table 3), they agreed about the damage to the teaching of some

Table 1. Participants' sociodemographic data.

Classification		n	%
Gender	Female	178	57.4%
	Male	132	42.6%
Race/Ethnicity	Light-skinned[1]	142	45.8%
	White	120	38.7%
	Black	43	13.9%
	Yellow	3	1.0%
	Indigenous	2	0.6%
Family Income	No income	1	0.3%
	1 MW*	13	4.2%
	1 to 3 MW	97	31.3%
	3 to 6 MW	76	24.5%
	6 to 9 MW	41	13.2%
	9 to 12 MW	31	10.0%
	12 to 15 MW	18	5.8%
	More than 15 MW	33	10.6%
Academic Status	Basic Cycle (2nd to 4th semesters)	122	39.4%
	Clinical Cycle (5th to 8th semesters)	98	31.5%
	Internship (9th to 12th semesters)	90	29.1%
Delays in the course progression	Yes	51	16.5%
	No	259	83.5%

*Minimum wage (MW) = R$ 1,045.00.

courses, such as Medicine, if it becomes entirely theoretical (57/59, 96.6% agreed or totally agreed, 5±1); the fact that some students do not have access to the technologies needed for remote education, which would make this model unfair (54/59, 91.5%, 5±1); the damage to the quality of teaching due to the sudden adaptation of teachers to the remote model (49/59, 83.1%, 4±1); and the fact that the remote teaching technologies do not allow good use of the teaching-learning model (33/59, 55.9%, 4±1).

Table 2. Reasons for being in favor of adopting the remote model.

Classification		n	%	IQR
Desire not to delay the course	Totally Agree	138	54.9%	1
	Agree	78	31.1%	
	Neither agree nor disagree	16	6.4%	
	Disagree	12	4.8%	
	Totally Disagree	7	2.8%	
Desire to advance theoretical subjects so that a return to the classroom is not so overloaded	Totally Agree	196	78.1%	0
	Agree	47	18.7%	
	Neither agree nor disagree	4	1.6%	
	Disagree	3	1.2%	
	Totally Disagree	1	0.4%	
Need to incorporate new teaching technologies	Totally Agree	89	35.5%	4±2
	Agree	84	33.5%	
	Neither agree nor disagree	57	22.7%	
	Disagree	15	6%	
	Totally Disagree	6	2.4%	

Table 3. Reasons for being against the adoption of the remote teaching model.

Classification		n	%	IQR
I don't have or don't think all colleagues have access to the necessary technologies, so that would be unfair.	Totally Agree	31	52.5%	5±1
	Agree	23	39%	
	Neither agree nor disagree	2	3.4%	
	Disagree	2	3.4%	
	Totally Disagree	1	1.7%	
The teaching of some courses, especially medicine, would be seriously impaired if it became entirely theoretical.	Totally Agree	42	71.1%	5±1
	Agree	15	25.4%	
	Neither agree nor disagree	1	1.7%	
	Disagree	1	1.7%	
	Totally Disagree	0	0	
The quality of teaching would suffer as teachers abruptly adapt to this new technology.	Totally Agree	28	47.5%	4±1
	Agree	21	35.6%	
	Neither agree nor disagree	10	16.9%	
	Disagree	0	0	
	Totally Disagree	0	0	
The technologies of ODL/remote education do not allow good use of the teaching-learning process.	Totally Agree	14	23.7%	4±1
	Agree	19	32.2%	
	Neither agree nor disagree	15	25.4%	
	Disagree	8	13.6%	
	Totally Disagree	3	5.1%	

Mental Health

As for anxiety symptoms indicated by the GAD-7 scale (Table 4), the average score was 7.83±5.40, ranging from 0 to 21. One-hundred and four students (33.5%) were classified as having moderate or severe symptom presentation (score greater than 10). No significant differences were detected regarding the prevalence of GAD-7>10 scores between genders (PR=1.24; 95% CI 0.89; 1.71), non-delayed and delayed course groups (PR=1.06; 95% CI: 0.71; 1.6), non-white and white groups (PR=1.02; 95% CI: 0.74; 1.41). The mean scale scores between these groups were also not different by the Student's t-test.

The results of the PHQ-9 scale (Table 5) indicated the presence of moderate to severe depressive symptoms (score greater than 10) in 132 students (42.6%), with an average score of 9.49±6.20, ranging from 0 to 26. Also, no significant differences were detected between the prevalence of PHQ-9>10 scores between females and males (PR=1.08; 0.89; 1.08), non-delayed and delayed course groups (PR=0.91; 95% CI: 0.63; 1.31), non-

Table 4. GAD-7 Results according to academic status.

			n	% (per academic status)
Academic Status	Basic Cycle (n=122)	Minimal	38	31.1%
		Low	47	38.5%
		Moderate	22	18.0%
		Severe	15	12.3%
	Clinical Cycle (n=98)	Minimal	30	30.6%
		Low	35	35.7%
		Moderate	22	22.4%
		Severe	11	11.2%
	Internship (n=90)	Minimal	26	28.9%
		Low	301	33.3%
		Moderate	14	15.6%
		Severe	20	22.2%

Table 5. PHQ-9 results according to the academic status.

			n	% (per academic status)
Academic Status	Basic Cycle (n=122)	Minimal	30	24.6%
		Mild	42	34.4%
		Moderate	22	18.0%
		Moderately Severe	17	13.9%
		Severe	11	9.0%
	Clinical Cycle (n=98)	Minimal	23	23.5%
		Mild	32	32.7%
		Moderate	25	25.5%
		Moderately Severe	13	13.3%
		Severe	5	5.1%
	Internship (n=90)	Minimal	18	20.0%
		Mild	33	36.7%
		Moderate	16	17.8%
		Moderately Severe	14	15.6%
		Severe	9	10.0%

white and white groups (PR=1.00; 95% CI: 0.77; 1.31). There was no difference between the mean scale scores between these groups according to Student's t-test.

Regarding educational aspects, students with PHQ-9>10 were more likely to respond negatively to the question "Would you like the UFBA to adopt the remote learning or distance learning model to continue classes during the pandemic period?" than those with lower scores (PR=1.42; 95% CI 1.08; 1.86). On the other hand, those with GAD-7>10 were less likely to use the increased time available from the suspension of face-to-face classes to study topics outside the health sciences (PR=1.51; 95% CI 1.02; 2.24. P=0.031, Pearson's Chi-square).

As for the resilience scale (Table 6), the Shapiro-Wilk test was performed, which confirmed the normality of the distribution of the results (p= 0.245). The mean score of the resilience scale was 122.73, with a standard deviation of 18.643 and values ranging from 47 to 172, corresponding to the moderately low resilience rating.

As for the classification of students by degree of resilience, 139 (44.8%) were classified as having low resilience; 33 (10.6%) as moderately low resilience; 104 (33.5%) as moderate resilience; and 34 (11%) as high resilience.

DISCUSSION

The studied sample had a sociodemographic profile compatible with other studies of the same target audience, conducted at the same or other medical education institutions[20-23].

The GAD-7 scale indicated that 104 students (33.5%) live with moderate or severe anxiety symptoms (GAD-7>10). In contrast, a study that also used the GAD-7 scale in medical students during the COVID-19 pandemic in the state of São Paulo in May 2020, found that 46.17% of the participants had GAD-7>10. The mean GAD-7 score in the study was 9.18 (a standard deviation of 4.75), while the present study found a mean of 7.83, with a standard deviation of 5.40[24]. Another study conducted in March 2020 with medical students in Germany obtained an average GAD-7 score of 5.43, with a standard deviation of 4.30[25]. The differences can be due to numerous factors, such as pandemic-related epidemiological parameters, cultural, educational, socioeconomic factors, and access to adequate information, among others[26].

These percentages are higher than those seen in studies analyzing the general Brazilian population, which estimate the prevalence of anxiety disorders between 19.9% and 28.1%[26].

There was no statistically significant difference in the prevalence of GAD-7 scores > 10 between genders, in contrast to another study carried out with medical students, which showed a higher frequency in the female population[24].

Less than half (42.6%) of the students indicated the presence of moderate to severe depressive symptoms (PHQ-9>10), in agreement with similar studies performed before the pandemic, which obtained values between 34.6% and 38.2%[10,26]. However, as with GAD-7, the finding is discrepant from the data found in another study, also carried out in Brazil, but conducted during the pandemic, which found a prevalence of PHQ-9>10 in 64.4% of medical students[24].

A study conducted in 2018 at the same educational institution also applied the PHQ-9 and the RS-25 with a similar methodology. This study found a slightly higher prevalence of depressive symptoms according to the PHQ-9: 47.1% of participants had PHQ-9≥10[22]. Some studies suggest that

Table 6. Resilience Scale results according to the academic status.

			n	% (per academic status)
Academic Status	Basic Cycle (n=122)	Low	52	42.6%
		Moderately Low	10	8.2%
		Moderate	50	41.0%
		High	10	8.2%
	Clinical Cycle (n=98)	Low	46	46.9%
		Moderately Low	12	12.2%
		Moderate	26	26.5%
		High	14	14.3%
	Internship (n=90)	Low	41	45.6%
		Moderately Low	11	12.2%
		Moderate	28	31.1%
		High	10	11.1%

professional stability is positively linked to higher resilience, which could have been negatively affected by the current moment[22]. However, when comparing the levels of resilience between the two studies, the present study showed a lower percentage of students classified as having low resilience, a higher percentage of moderate resilience, and equal high resilience. These results could be explained because, despite the distress of the pandemic and the uncertainty of return to normal activities, at the time the students were not exposed to classes, while in the 2018 study the students were attending school, and taking time for oneself is linked with higher resilience[22,27,29].

Despite numerous investigations on depression and anxiety, the number of studies assessing resilience among medical students, considering both the pre-pandemic and the pandemic periods, especially using the Wagnild and Young resilience scale (RS-25), is still incipient for a more robust comparison, which strengthens the relevance of the present study and raises the need for further research in this context.

Regarding the educational aspects, students with PHQ-9>10 were more likely to disagree with the ongoing classes during the pandemic period, an attitude that suggests the association of depression with the discontinuity of activities, which is in agreement with other studies[23,30]. This finding may be related to the impaired functionality and avoidance, which are consequent to depressive symptoms, more specifically resulting from the loss of enjoyment of meaningful activities, difficulty concentrating, fatigue, sleep alterations, as well as the increase in cases of depressive disorders during the pandemic and its relationship to work discontinuity[31,32].

Another important factor that may have led to a large number of medical students with low resilience and the presence of anxiety and depression in the present study is the health situation at the time, as the need for social isolation and physical distancing brings about changes in ways of coping with suffering[33].

LIMITATIONS

Our main limitations are: the study design was cross-sectional, making it impossible to assess causality; the use of self-applied scales, which by definition involves limitations regarding the accuracy of the collected data. In addition, one should take into consideration the heterogeneity of curricula and teaching methodologies among medical institutions around the world, requiring extra attention to attempts to extrapolate the results to these different contexts.

CONCLUSION

Regarding mental health status, about one-third of the students had high scores for anxiety and depression, as well as low scores for resilience. Due to the study methodology, it is not possible to assess the relationship between the pandemic and these findings. The results related to PHQ-9 and RS-25 were similar to those found in the pre-pandemic period. It is necessary to develop studies with different methodologies that can explore the perceptions and effects of the pandemic in this population.

AUTHORS' CONTRIBUTION

Mariana Camelier-Mascarenhas and Vitória Oliveira de Queirós: Study design, data collection and analysis, writing of the primary draft and final version, final review. Thiago Aguiar Jesuino and Luiza Lopes Cabral Brito: Writing of the primary draft and final version, final review. Santiago Mozart Fernandes and Amanda Galvão-de Almeida: writing of final version, final review.

CONFLICTS OF INTEREST

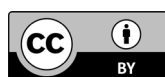The authors declare no conflicts of interest.

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