


Prevalence and risk factors associated with common mental disorders among medical students

Prevalência e fatores de risco associados a transtornos mentais comuns entre os estudantes de medicina

Prevalencia y factores de riesgo asociados a trastornos mentales comunes entre los estudiantes de medicina

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Abstract

Objective: To identify the prevalence of common mental disorders (CMD) in medical students at Vila Velha University (UVV), ES, and its associated factors. **Methods:** A cross-sectional study was conducted with 360 medical students from February to April 2018. A self-administered, confidential and online questionnaire was used, including sociodemographic, economic data, family support, friends' network, physical activity and academic performance, as well as Self-Reporting Questionnaire (SRQ-20). Statistical analysis was performed using the STATA program, version 13.0. The Ethics Committee on Research with Humans approved the study, under number 2.108.290. **Results:** The prevalence of CMD among students was 45.6%. Risk factors were mental disorder in the family (RR 1.24, 95% CI 1.01-1.54), poor sleep quality (RR 1.49, 95% CI 1.17-1.90), fear that impaired the academic result (RR 1.33, 95% CI 1.01-1.77), feeling rejected by friends (RR 1.45, 95% CI 1.07-1.96), thinking about giving up the course (RR 1.67, 95% CI 1.29-2.17) and physical discomfort during the test (RR 1.63, 95% CI, 1.21-2.20). **Conclusions:** The overall prevalence of CMD among students was high, and the risk factors were significant. It is recommended that educational institutions and responsible government agencies be able to formulate and subsidize preventive actions and care for the mental health of medical students.

Keywords: Students, Medical; Mental Disorders; Epidemiology; Risk Factors

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Resumo

Objetivo: Identificar a prevalência de transtornos mentais comuns (TMC) nos estudantes de medicina da Universidade Vila Velha (UVV), ES, e seus fatores associados. **Métodos:** Estudo transversal com 360 estudantes de medicina, de fevereiro a abril de 2018. Utilizou-se um questionário autoaplicável, confidencial e online, incluindo dados sociodemográficos, econômicos, suporte familiar, rede de amigos, atividade física e desempenho acadêmico, assim como o teste Self-Reporting Questionnaire (SRQ-20). A análise estatística foi realizada utilizando-se do programa STATA, versão 13.0. O Comitê de Ética em Pesquisa com Seres Humanos aprovou o estudo, sob o número 2.108.290. **Resultados:** A prevalência de TMC entre os estudantes foi de 45,6%. Os fatores de risco foram transtorno mental na família (RR 1,24; IC95% 1,01-1,54), qualidade do sono insatisfatória (RR 1,49; IC95% 1,17-1,90), medo que prejudica o rendimento escolar (RR 1,33; IC95% 1,01-1,77), sentir-se rejeitado pelos amigos (RR 1,45; IC95% 1,07-1,96), pensar em desistir do curso (RR 1,67; IC95% 1,29-2,17) e desconforto físico durante a prova (RR 1,63; IC95% 1,21-2,20). **Conclusões:** A prevalência geral de TMC entre os estudantes foi alta, e os fatores de risco foram expressivos. Recomenda-se que as instituições de ensino e órgãos governamentais responsáveis possam formular e subsidiar ações preventivas e um cuidado à saúde mental dos estudantes de medicina.

Palavras-chave: Estudantes de Medicina; Transtornos Mentais; Epidemiologia; Fatores de Risco

Resumen

Objetivo: Identificar la prevalencia de trastornos mentales comunes (TMC) en los estudiantes de medicina de la Universidad Vila Velha (UVV), ES, y sus factores asociados. **Métodos:** Estudio transversal con 360 estudiantes de medicina, de febrero a abril de 2018. Se utilizó un cuestionario autoaplicable, confidencial y online, incluyendo datos sociodemográficos, económicos, soporte familiar, red de amigos, actividad física y desempeño académico, así como el examen Self-Reporting Questionnaire (SRQ-20). El análisis estadístico se realizó utilizando el programa STATA, versión 13.0. El Comité de Ética en Investigación con Seres Humanos aprobó el estudio, bajo el número 2.108.290. **Resultados:** La prevalencia de TMC entre los estudiantes fue del 45,6%. Los factores de riesgo fueron trastorno mental en la familia (RR 1,24, IC95% 1,01-1,54), calidad del sueño insatisfactoria (RR 1,49, IC95% 1,17-1,90), miedo que perjudica el rendimiento escolar (RR 1,33, IC95% 1,01-1,77), sentirse rechazado por los amigos (RR 1,45, IC95% 1,07-1,96), pensar en desistir del curso (RR 1,67, IC95% 1,29-2,17) y la incomodidad física durante la prueba (RR 1,63, IC95% 1,21-2,20). **Conclusiones:** La prevalencia general de TMC entre los estudiantes fue alta, y los factores de riesgo fueron expresivos. Se recomienda que las instituciones de enseñanza y órganos gubernamentales responsables puedan formular y subsidiar acciones preventivas y un cuidado a la salud mental de los estudiantes de medicina.

Palabras clave: Estudiantes de Medicina; Trastornos Mentales; Epidemiología; Factores de Riesgo

Introduction

Scientific investigations have been identifying a high prevalence of psychiatric symptoms and Common Mental Disorders (CMD) among medical students, mainly associated with academic excess.^{1,2} The stressed medical university environment, many times, harms the student's academic performance in their physical health and psychosocial well-being, affecting their quality of life.³

CMD is a syndrome characterized by depressive and anxiety symptoms, irritability, fatigue, insomnia, memory, and concentration difficulty,^{1,4-6} which can manifest as a mixture of somatic symptoms,^{5,6} like tremors, headache, poor digestion, among others.⁶

The study performed with Gondar University Students in Ethiopia found a CMD prevalence of 40.9%.⁷ Another study with students from a public university in a Brazilian South region found 51.5%⁸ and in a Brazilian Southeast region found 31.7%.¹ Studies in the scientific literature show that the prevalence of CMD is higher among medical students than the general population, as they are subject to a higher potential, such as failure of the network of friends, knowledge overload, problem selection, individualism, social responsibilities and absences from the role of doctor, contact with death and pathological processes, physical exercise of patients, fear of getting sick, fear of making mistakes and feelings of helplessness in the face of certain illnesses, lack of religious practice, financial problems, family history of mental disorders, drug

use, and poor academic outcomes. These factors can lead students to psychological defense mechanisms such as dissociation or isolation.^{1,2,4,7}

The knowledge of associated factors to CMD among medical students becomes essential so that the educational institution can carry out institutional strategies to improve the students' quality of life and even make it reflect on the current curriculum model. Therefore, this study aimed to estimate the CMD prevalence and associated factors in a private university among medical students.

Methods

The transversal study performed with first to sixth year *Vila Velha* University (UVV) medical students, from February to April 2018. The UVV is a private university located in *Vila Velha*, a municipality in the Metropolitan Region of *Espírito Santo* State. In 2007 the Medical School was implanted, has a duration of six years with integral dedication, and uses the Problem Based Learning (PBL) as a learning methodology. The regular registration in Vila Velha University (UVV) is a requirement to participate in this study, which represented approximately 780 medical students. All students were invited to participate in the research by disclosing the invitation to the announcement wall in the academic blog and the classroom.

The sample size was calculated using Stata statistical program, presuming a population of 780, a confidence level of 95%, a random error of 20%, and CMD prevalence of 51.5%,⁸ estimating a sample of 258 students.

The information was obtained using a structured online, self-applicable, and confidential questionnaire, divided into five sections. The first section contains students' sociodemographic characteristics. The second section has information about the students' relationship with their relatives. The third section investigates the teaching-learning process, the performance, and satisfaction with the course. The fourth section contains information about students and their relatives' mental health follow-up. Lastly, the fifth section is the Self-Reporting Questionnaire (SRQ-20).^{9,10}

The SRQ-20 was used in this study to estimate the students' CMD prevalence. This standardized instrument was created by the World Health Organization (WHO) to psychiatric disturbs' screening in Primary Health Care services, and it was validated in Brazil by Mari and Williams.¹¹ The SRQ-20 has 20 questions with yes and no answers, being four about physical symptoms and 16 about psycho-emotional disorders. The symptoms analyzed refer to the last 30 days and for each affirmative answer, it is attributed to one point, resulting in a final score that varies from 0 to 20 points. The students were distributed in two groups accordingly to their punctuation in SRQ-20, being the cut-off point different for men and women. Men with punctuation lower than or equal to five and women with punctuation lower than or equal to seven were classified as "not suspected to CMD." Men with punctuation greater than or equal to six and women with punctuation greater than or equal to eight were classified as "suspected to CMD".

The questionnaire was applied in order to evaluate the information quality before the beginning of the study to 10 students enrolled in other UVV graduation courses and some modifications in the instrument were made. Since it is an online fulfilled questionnaire, as soon as the student submits their answers, the information was automatically inserted in a spreadsheet in Excel 2010, which eliminated the incompleteness answer problem.

The statistical analyses were performed using STATA, version 13.0. We described continuous variables as means \pm standard, and categorical variables as counts and percentages in tables' data presentation of the total and partial sample. A Poisson regression model with robust variance estimation was used to identify the CMD associated factors among medical students that never had psychiatric and/or psychological treatment. The exclusion of students with previous psychiatric and/or psychological treatment ($n = 42$) was because the study aimed to identify only the influencing factors on the behavior's student after they were enrolled in the university medical course. The regression model was adjusted to control confounding variables, and, before entered in the model, the variables that presented independent association to CMD were identified when presented p -value <0.05 . The variables entered in the multiple regression model using the Backward Stepwise method to evaluate the variables that presented CMD independent association and considered the ones who finished the model with p -value <0.05 . Tests were used to evaluate the model-adjusted quality. It was used a hierarchical model organized in levels. The first level included the variables related to the student and his family that was "sex," "a mental disorder in the family," "students' chronic and physical disease," and "physical activity practice." In the second level were the variables related to the students' relationship with friends and family, and how they feel in the university, that included "difficulty to make friends", "friends' emotional support", "feel rejected by friends", "parents' emotional support", "relationship difficulty with parents", "liberty to talk to their parents", "difficulty to clarify doubts in the classroom", "fear that compromises the academic performance", "sleeping difficulty", "sleeping quality", "physical discomfort during exams", and "difficulty to balance study and leisure". On the third level was included the variables about their satisfaction and performance with the course, which were "thought about giving up the course", "course level of satisfaction", "classes dynamic", "satisfaction with the grades", and "academic perform".

The UVV Research Ethics Committee, under the number 2.108.290, approved the research on June 8th 2017. The students were informed about the research and electronically consented their participation before answered the online questionnaire.

Results

From 398 students who answered the questionnaire, 38 students were in psychiatric and/or psychological treatment before enrolling in the Medical course in the university.

The majority interviewed was female, white and single. The age average was 21 years and the majority was enrolled in the first two years of the course. The vast majority presented their expenses sponsored by their family and, approximately a fourth of them had a relative with a mental disorder. Many did not practice any physical activity and 39 (10.8%) informed having a chronic physical disease. There was no difference between total and partial sample (Table 1).

The SRQ-20 mean score was 7.0 (SD 4.4) in the total sample and 6.6 (SD 4.2) in the partial sample, varying from 0 to 20 (Table 1).

The participants' emotional characteristics are presented in table 2. Many students reported sleeping difficulties; in a little more than half the sleep quality was poor; besides that, almost two-thirds do not achieve study and leisure balance. Some described difficulty in making friends, more than half feel rejected, and 4.5% (total sample) and 3.6% (partial sample) do not have friends' emotional support. About their relationship with their parents, the majority referred has parents' emotional support; however, just over a third have

Table 1. The participants' sociodemographic and health characteristics and family mental health, *Vila Velha* University-ES, Brazil, 2018.

Variables	Total sample (n = 402) n (%)	Partial sample ^a (n = 360) n (%)	p value ^b
Age ^c	21.8 (3.5)	21.9 (3.6)	
Sex			0.586
Male	152 (37.8)	144 (40.0)	
Female	250 (62.2)	216 (60.0)	
Skin Color			
White	289 (71.9)	253 (70.3)	0.681
Not white	113 (28.1)	107 (29.7)	
Age (years)			0.970
<19	100 (24.9)	87 (24.2)	
20-24	238 (59.2)	216 (60.0)	
25+	64 (15.9)	57 (15.8)	
Marital Status			0.973
Single	381 (94.8)	341 (94.7)	
Married/stable union	21 (5.2)	19 (5.3)	
Course Period (Year)			0.998
1º	117 (29.1)	101 (28.1)	
2º	147 (36.6)	133 (36.9)	
3º	31 (7.7)	27 (7.5)	
4º	55 (13.7)	51 (14.2)	
5º	30 (7.5)	26 (7.2)	
6º	22 (5.5)	22 (6.1)	
Students' Mental Disorders - SRQ	7.0 (4.4) ^c	6.6 (4.2) ^c	0.342
Suspect	199 (49.3)	164 (45.6)	
Non suspect	205 (50.7)	196 (54.4)	
Students' Chronic Physical Disease			0.325
Yes	54 (13.4)	39 (10.8)	
No	348 (86.6)	321 (89.2)	
Physical Activity Practice			0.650
Yes	237 (59.0)	219 (60.8)	
No	165 (41.0)	141 (39.2)	
Mental Disorder in the family			0.799
Yes	101 (25.1)	83 (23.0)	
No	270 (67.2)	249 (69.2)	
Do not know	31 (7.7)	28 (7.8)	

^aPartial sample within the adolescents with psychiatric and/or psychological treatment prior; ^bChi-square heterogeneity test; ^c Average and standard deviation (SD).

relationship difficulty and do not have the liberty to talk to their parents about many subjects. Some also presented difficulties in the classroom, where over half referred no achievement on clarifying their doubts in the classroom. Just over two-fifths stated that the fear compromises their academic performance and over half presented physical discomfort during the exams. There was no difference between the samples (Table 2).

Table 2. Analyzed participants' emotional characteristics, *Vila Velha* University-ES, Brazil, 2018.

Variables	Total sample (n = 398) n (%)	Partial sample ^a (n = 360) n (%)	p value ^b
Sleeping Difficulty			0.652
Yes	84 (20.9)	67 (18.6)	
Sometimes	59 (14.7)	50 (13.9)	
No	259 (64.4)	243 (67.5)	
Sleeping Quality			0.294
Satisfactory	172 (42.8)	162 (45.0)	
Unsatisfactory	230 (57.2)	198 (55.0)	
Difficulty to balance study and leisure			0.979
Yes	162 (40.3)	143 (39.7)	
Sometimes	91 (22.6)	81 (22.5)	
No	149 (37.1)	136 (37.8)	
Difficulty to make friends			0.715
Yes	36 (9.0)	30 (8.3)	
Sometimes	123 (30.6)	102 (28.3)	
No	243 (60.4)	228 (63.3)	
Friends' emotional support			0.619
Yes	301 (74.9)	280 (77.8)	
Sometimes	83 (20.6)	67 (18.6)	
No	18 (4.5)	13 (3.6)	
Feel rejected by friends			0.641
Yes	182 (45.3)	153 (42.5)	
No	152 (37.8)	148 (41.1)	
Sometimes	68 (16.9)	59 (16.4)	
Parents' emotional support			0.978
Yes	304 (75.6)	272 (75.6)	
Sometimes	66 (16.4)	58 (16.1)	
No	32 (8.0)	30 (8.3)	
Relationship difficulty with parents			0.851
Yes	64 (15.9)	52 (14.4)	
Sometimes	61 (15.2)	56 (15.6)	
No	277 (68.9)	252 (70.0)	
Liberty to talk to their parents			0.995
Yes	142 (35.3)	127 (35.3)	
Sometimes	116 (28.9)	105 (29.2)	
No	144 (35.8)	128 (35.6)	
Difficulty to clarify doubts in the classroom			0.897
Yes	138 (34.3)	118 (32.8)	
Sometimes	86 (21.4)	80 (22.2)	
No	178 (44.3)	162 (45.0)	
Fear that compromises the academic performance			0.509
Yes	107 (26.6)	84 (23.3)	
Sometimes	65 (16.2)	56 (15.6)	
No	230 (57.2)	220 (61.1)	
Physical discomfort during exams			0.748
Yes	147 (36.6)	123 (34.2)	
Sometimes	72 (17.9)	70 (19.4)	
No	183 (45.5)	167 (46.4)	

^aPartial sample within the adolescents with psychiatric and/or psychological treatment prior; ^bChi-square heterogeneity test.

Concerning their feelings towards the medical course, despite one third have thought at some point to give up the course, few are not satisfied with the course and, part of the dissatisfaction is related to the class dynamic. Nevertheless, more than half are satisfied with their grades and their academic achievement. A statistically significant difference between the samples was not found (Table 3).

Table 3. Participants' vision on information about the course, *Vila Velha* University-ES, Brazil, 2018.

Variables	Total sample (n = 398)	Partial sample ^a (n = 360)	p value ^b
	n (%)	n (%)	
Thought about giving up the course			0.995
Yes, still think about it	34 (8.4)	30 (8.3)	
Yes, but not anymore	96 (23.9)	87 (24.2)	
No	272 (67.7)	243 (67.5)	
Classes dynamic			0.305
Insuficient	18 (4.5)	10 (2.8)	
Regular	94 (23.4)	71 (19.7)	
Good	210 (52.2)	197 (54.7)	
Excelent	80 (19.9)	82 (22.8)	
Course level of satisfaction			0.950
Insuficient	5 (1.2)	3 (0.8)	
Regular	37 (9.2)	33 (9.2)	
Good	155 (38.6)	142 (39.4)	
Excelent	205 (51.0)	182 (50.6)	
Satisfaction with the grades			0.999
Insuficient	55 (13.7)	49 (13.6)	
Regular	141 (35.0)	125 (34.7)	
Good	170 (42.3)	153 (42.5)	
Excelent	36 (9.0)	33 (9.2)	
Academic performance			0.879
Insuficient	19 (4.7)	13 (3.6)	
Regular	123 (30.6)	109 (30.3)	
Good	231 (57.5)	210 (58.3)	
Excelent	29 (7.2)	28 (7.8)	

^aPartial sample within the adolescents with psychiatric and/or psychological treatment prior; ^bChi-square heterogeneity test.

The CMD medical students' associated factors were mental disorder present in the family (RR 1.24; 95% CI 1.01, 1.54), unsatisfactory sleep quality (RR 1.49; 95% CI 1.17, 1.90), fear that compromises the academic performance (RR 1.33; 95% CI 1.01, 1.77), feel rejected by friends (RR 1.45; 95% CI 1.07, 1.96), thought about giving up the course (RR 1.67; 95% CI 1.29, 2.17), as well as physical discomfort during the exams (RR 1.63; 95% CI 1.21, 2.20) (Table 4).

Discussion

In this present study, the CMD prevalence among medical students was 45.6%. This prevalence resembles the one found in the Netherlands (48.0%)¹² and in Ethiopia (40.9%).⁷ In Island (22.5%),¹³ Australia (19.2%),¹⁴ as well as in *Espírito Santo* University (37.1%),¹ the prevalence was lower than in this study.

Table 4. Brute and adjusted analysis of the associated factors of the medical students' mental disorders without previous psychological and/or psychiatric treatment in *Vila Velha* University-ES, Brazil, 2018 (n = 360).

Variables		Mental disorders		RR	
		Yes	No	Brute	Adjusted
Sex	Male	53	91	1	1
	Female	111	105	1.40 (1.09; 1.79)	0.98 (0.76; 1.25)
Mental Disorder in the family	Yes	50	33	1.58 (1.25; 2.00)	1.24 (1.01; 1.54)
	Do not know	19	9	1.78 (1.32; 2.40)	1.26 (0.90; 1.74)
	No	95	154	1	1
Students' Chronic Physical Disease	Yes	23	16	1.34 (1.01; 1.79)	0.92 (0.70; 1.20)
	No	141	180	1	1
Physical Activity Practice	Yes	90	129	0.78 (0.63; 0.98)	0.93 (0.76; 1.15)
	No	74	67	1	1
Difficulty to make friends	Yes	23	7	2.16 (1.66; 2.81)	1.29 (0.95; 1.76)
	Sometimes	60	42	1.65 (1.30; 2.10)	1.21 (0.95; 1.54)
	No	81	147	1	1
Friends' emotional support	Yes	105	175	0.54 (0.36; 0.80)	1.03 (0.66; 1.63)
	Sometimes	50	17	1.08 (0.73; 1.59)	1.16 (0.74; 1.82)
	No	9	4	1	1
Feel rejected by friends	Yes	97	56	2.47 (1.83; 3.33)	1.45 (1.07; 1.96)
	Sometimes	29	30	1.91 (1.31; 2.79)	1.41 (0.97; 2.04)
	No	38	110	1	1
Parents' emotional support*	Yes	109	163	0.60 (0.45; 0.80)	0.82 (0.60; 1.12)
	Sometimes	35	23	0.90 (0.65; 1.26)	0.92 (0.65; 1.28)
	No	20	10	1	1
Relationship difficulty with parents*	Yes	36	16	1.73 (1.36; 2.19)	1.22 (0.95; 1.56)
	Sometimes	27	29	1.20 (0.88; 1.64)	0.76 (0.55; 1.06)
	No	101	151	1	1
Liberty to talk to their parents	Yes	41	86	0.56 (0.42; 0.75)	0.82 (0.63; 1.07)
	Sometimes	49	56	0.81 (0.63; 1.04)	1.01 (0.79; 1.30)
	No	74	54	1	1
Difficulty in clarifying doubts in the classroom	Yes	71	47	1.50 (1.18; 1.90)	0.92 (0.71; 1.19)
	Sometimes	28	52	0.87 (0.61; 1.24)	0.61 (0.45; 0.84)
	No	65	97	1	1
Fear that compromises the	Yes	61	23	2.25 (1.78; 2.84)	1.33 (1.01; 1.77)
	Sometimes	32	24	1.77 (1.31; 2.38)	1.27 (0.93; 1.73)
	No	71	149	1	1
Sleeping difficulty*	Yes	46	21	1.85 (1.47; 2.33)	1.29 (1.00; 1.65)
	Sometimes	28	22	1.51 (1.12; 2.03)	0.96 (0.70; 1.32)
	No	90	153	1	1
Sleeping quality	Satisfactory	50	112	1	1
	Unsatisfactory	114	84	1.86 (1.44; 2.42)	1.49 (1.17; 1.90)
Physical discomfort during exams	Yes	80	43	2.26 (1.72; 2.97)	1.63 (1.21; 2.20)
	Sometimes	36	34	1.79 (1.28; 2.49)	1.54 (1.12; 2.12)
	No	48	119	1	1

Continuation Table 4.

Variables		Mental disorders		RR	
		Yes	No	Brute	Adjusted
Difficulty to balance study and leisure*	Yes	90	53	2.14 (1.60; 2.86)	1.53 (1.14; 2.06)
	Sometimes	34	47	1.43 (0.99; 2.06)	1.09 (0.76; 1.54)
	No	40	96	1	1
I thought about giving up the course	Yes, still think	25	5	2.27 (1.81; 2.86)	1.67 (1.29; 2.17)
	Yes, but do not think anymore	50	37	1.57 (1.23; 2.00)	1.30 (1.02; 1.65)
	No	89	154	1	1
Level of satisfaction with the course	Insufficient	3	0	1	1
	Regular	22	11	0.67 (0.52; 0.85)	1.20 (0.78; 1.84)
	Good	70	72	0.49 (0.42; 0.58)	1.06 (0.71; 1.58)
	Excellent	69	113	0.38 (0.1; 0.46)	0.89 (0.58; 1.36)
Classes dynamic*	Insufficient	12	3	1	1
	Regular	44	39	0.66 (0.48; 0.92)	1.10 (0.71; 1.71)
	Good	82	108	0.54 (0.40; 0.73)	1.01 (0.62; 1.66)
	Excellent	26	46	0.45 (0.30; 0.67)	0.98 (0.52; 1.85)
Satisfaction with the grades*	Insufficient	34	15	1	1
	Regular	57	68	0.66 (0.50; 0.86)	0.81 (0.58; 1.11)
	Good	62	91	0.58 (0.45; 0.76)	0.76 (0.52; 1.10)
	Excellent	11	22	0.48 (0.29; 0.81)	1.10 (0.58; 2.08)
Academic perform*	Insufficient	10	3	1	1
	Regular	50	59	0.60 (0.41; 0.85)	0.81 (0.53; 1.23)
	Good	95	115	0.59 (0.42; 0.82)	0.92 (0.58; 1.44)
	Excellent	9	19	0.42 (0.22; 0.77)	0.66 (0.30; 1.44)

* Variable eliminated in your hierarchical level.

Meta-analysis research with Brazilian medical students identified a CMD prevalence of 31.5%.¹⁵ However, it is observed differences in CMD prevalence among the universities. Some presented prevalence more significant than the one observed in the meta-analysis, such as universities located in *São Paulo* (44.7%),² in Sergipe (40.0%)¹⁶ and Southeast Bahia (32.2%).¹⁷

These differences founded can be attributed to social, cultural and environmental factors, as well as due to the different instruments used to identify the mental disorders among students. Besides, this result can be because of the real difference.

The CMD prevalence in this study was higher among female students when compared to males. This finding is similar to studies performed in Saudi Arabia,¹⁸ Ethiopia,⁷ Malaysia¹⁹ and Brazil.^{15,20-22} However, some studies did not find sex differences in CMD prevalence.^{1,2,16} The way women face social, economic and environmental situations is different from men, which is why women are more subject to developing mental disorders.²³

Although the present study did not find an association between the years of study and CMD, another research performed in Brazil identified that students in more advanced semesters are more likely to have CMD than the ones in the initial years.¹⁶ However, a study performed in Ethiopia also did not find an association between years of study and CMD.⁷ This can be explained by the fact that the participants in

this study learn through the PBL method, and the prevalence of psychic suffering is lower in students who learn through PBL when compared to the students learning through traditional method.²⁴ Possibly, this can be attributed to the fact that the student participates actively in the knowledge search through tutorial sessions, practical classes and public health unities medical services follow-up since the beginning of their course, which raises their motivation and security concerning the learning content.

The unsatisfactory sleep quality was another factor that presented association to CMD between the participants of this study. The extensive educational content, the constant pressure and the stress lived by the students during the entire course, added to the lack of time for leisure and few hours of sleep per night, generate feelings of anguish and anxiety.^{15,22,24} Sleep perturbations may produce significant individual alterations in physical functioning,²⁵ occupational, cognitive and social, besides compromise substantially the students' quality of life.²⁵

Besides, the fear with their academic performance, the desire to give up the course and the physical discomfort during the exams were some other factors associated with CMD in this study. The poor academic performance and the desire to give up the course were risk factors also found in *Botucatu* University medical students.² In Belgrade, the CMD risk was among students who presented stress during the exam²⁶ and, in Sergipe, among the students who do not feel well, happy and satisfied with their course.¹⁶ The fear was another factor very present in the medical student. Many times, the need to talk to the professor to clarify some doubts was a stressing factor for the student.^{1,26}

The emotional support, mainly by friends, is essential for reducing CMD among medical students. This study observed that the students that felt rejected by their friends presented a higher risk to CMD. This finding coincides with other studies performed in Brazil^{1,2,15} and Ethiopia.⁷

Although the relatives' mental health is another factor that will influence CMD risk, this study found a higher CMD risk among students who had relatives with mental disorders and this finding is the following study performed in Ethiopia.⁷ This can be explained by the genetic predisposition and familiar conditions since the presence of a familiar with CMD raises the risk for stress.²³

This study presents some significant limitations that can influence in results' interpretation. First, a transversal study cannot establish a cause-effect relation. However, this problem was minimized by excluding from the research the students who did or were still doing psychological and/or psychiatric treatment. Besides, the study presented a selection bias due to free assent by the student to the research, which can cause differences in the found prevalence, but not in the association. Another bias that can be present is the information bias since the data were collected by self-referred information; however, this bias is reduced when the information is collected secretively. Lastly, it is necessary to consider that the SRQ-20 track CMD suspected cases, being the psychiatrist interview the gold standard for diagnosis.

Conclusion

The CMD general prevalence among the students was high and more prevalent in women. The existence of a familiar with CMD, the friends' rejection, the fear compromising the academic performance, the poor sleep quality, the physical discomfort during the exams and even the desire to give up the course

were CMD associated factors. Therefore, it is recommended that educational institutions, governmental agencies and the families be alert to this problem that affects the medical students. Programs destined to reduce the medical student mental suffering need to be implanted to identify the risk factors and to take action with measures to reduce this alarming scenario.

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Author's contribution

Conception and/or design of the study: ASSGM, FACV, ARMS, WLP. Data gathering, analysis or interpretation: ASSGM, FACV, ARMS, WLP. Preliminary draft: ASSGM, FACV, ARMS, WLP. Critical review of the preliminary draft: ASSGM, FACV, ARMS, WLP. All the authors have approved the final version and agreed to be accountable for all aspects of the work

Conflict of interest

None declared.

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