

# Common mental disorders among medical students at Universidade Federal de Sergipe: a cross-sectional study\*

## *Transtornos mentais comuns entre estudantes de medicina da Universidade Federal de Sergipe: estudo transversal\**

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### Abstract

**Objective:** Estimate the prevalence of common mental disorder and its associated factors among medical students of the Universidade Federal de Sergipe. **Method:** A cross-sectional study was carried out, applying Self Reporting Questionnaire-20 to 473 students from the 512 medical students enrolled in 2006 and compared with a structured questionnaire by the authors containing information on the socio-demographic characteristics, the teaching-learning process and the psycho-emotional experiences of the students. Freshmen were excluded after initial comparison with the students already exposed to the medical course. Statistical analysis by multiple logistic regression after calculating simple and adjusted odds ratio (OR). **Results:** The general prevalence of common mental disorder was 40% (n = 473); after exclusion of the freshmen it increased to 42.5% among students from the 2<sup>nd</sup> to the 12<sup>th</sup> semester. It was higher among those who did not have faith in their acquisition of the skills needed to become a good doctor (OR = 2.82), who felt less comfortable about course activities (OR = 3.75), who considered themselves emotionally stressed (OR = 2.14), among those who did not consider themselves happy (OR = 2.85), who believed that the course did not match their expectations (OR = 1.64) and those who had a prior diagnosis of mental disorder by a psychiatrist (OR = 3.78). **Conclusion:** The results suggest the necessity of changes to the teaching-learning process and the establishment of a preventive mental health program for medical students.

**Descriptors:** Mental disorders; Students, medical; Mental health; Education, medical; Occupational health

### Resumo

**Objetivo:** Estimar a prevalência de transtorno mental comum e fatores associados entre estudantes de Medicina da Universidade Federal de Sergipe. **Método:** Estudo transversal com 473 dos 512 matriculados em 2006, aplicando o Self Reporting Questionnaire-20 e um questionário estruturado sobre características sociodemográficas, processo ensino-aprendizagem e vivências psicoemocionais. Os calouros foram excluídos após comparação inicial com os alunos do 2<sup>o</sup> ao 12<sup>o</sup> períodos. Análise estatística por regressão logística múltipla, após estatística descritiva e cálculo das ORs simples e ajustadas. **Resultados:** A prevalência de transtorno mental comum geral foi de 40% (n = 473), mas com a retirada dos calouros, aumentou para 42,5% (n = 433) entre os alunos do 2<sup>o</sup> ao 12<sup>o</sup> semestre, sendo maior entre aqueles que não acreditavam ter adquirido habilidades para se tornarem bons médicos (OR = 2,82), que se sentiam pouco confortáveis com as atividades do curso (OR = 3,75), que se consideravam emocionalmente tensos (OR = 2,14), nos que não se consideravam felizes (OR = 2,85), nos que achavam que o curso era menos do que esperavam (OR = 1,64) e nos que tiveram diagnóstico prévio de transtorno mental feito por psiquiatra (OR = 3,78). **Conclusão:** Os resultados sugerem a necessidade de mudanças no processo ensino-aprendizagem, bem como estruturação de programas para cuidar da saúde mental dos estudantes.

**Descritores:** Transtornos mentais; Estudantes de medicina; Saúde mental; Educação médica; Saúde ocupacional

### Introduction

Common mental disorders (CMD) refer to minor psychiatric disorders (anxiety, depressive and somatoform disorders)<sup>1</sup> and

“include symptoms such as: insomnia, fatigue, irritability, forgetfulness, difficulty concentrating, and somatic problems”.<sup>2</sup>

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CMD are considered relevant public health problems due to the restrictions that they may cause and to the worsening of the risk of symptoms if they are not identified early.<sup>3</sup> The prevalence of CMD verified in the industrialized countries ranged from 7% to 30%, while in the Brazilian population it was between 22% and 35%.<sup>4,5</sup> It was 56% among patients seen by doctors at the family health program units.<sup>6</sup>

The World Health Organization (WHO), concerned about the impact of these disorders, created the Self Report Questionnaire (SRQ)<sup>7</sup> to enable early diagnosis of CMD and the establishment of preventive measures. Thus, several primary care studies<sup>1,8,9</sup> were conducted and researches on CMD related to occupational health are increasing.<sup>5,10</sup> In recent years, our attention has turned to research using medical students as the object of study and on the mental disorders that they may develop during their medical training<sup>11-13</sup>

This study aims at assessing the prevalence of CMD among Universidade Federal de Sergipe (UFS) medical students, identifying likely risk factors associated with this condition and ascertaining the socio-demographic profile of this population. It is also part of a broader study,<sup>14</sup> which contains a qualitative research using focal groups, to be presented in a future release.

## Method

### 1. Setting

The UFS, which is the only institution to offer a medical course in the State of Sergipe. At the time of this research, UFS had 80 vacancies per year for the entrance examination for Medicine: 40 students enter in the first half and the others in the second half according to their exam ranking.

The course is based on a traditional medical teaching model with 12 periods (semesters) classified as follows: from the 1<sup>st</sup> to the 4<sup>th</sup> (Basic Course), and from the 5<sup>th</sup> semester on (Professional Cycle).

### 2. Target population and studied population

All UFS medical students were invited to participate; 473 accepted the research terms from the total of 512 enrolled at the time of this research. Thirteen classes were included (one more than expected), due to the delay caused by preview strikes. For the same reason, the 10th semester class was still attending the preliminary meetings for the beginning of the internship and, as a consequence, only the pupils from the 11th semester and from the two classes of the 12th semester were analyzed as internship students. Thus, the students who had joined UFS in 2000/1 (trainees) up to and including those who had joined in 2006/1 (freshmen) were surveyed.

### 3. Pilot study

This was applied in 2005 to the fifth-semester medical students aiming at training the project Volunteers on the acquisition of data and refinement of the instruments to be used in the research itself, as well as evaluation of the receptiveness of the students to this study.

## 4. Study design and data collection

A cross-sectional study was carried out in May 2006 (the start of classes at UFS was late, due to strikes by students and UFS employees): collection of data was on the first day of classes for the freshmen and in the middle of the semester for the others. Most of the questionnaires were administered in the classroom, after a letter to the teachers requesting their cooperation in giving up a few minutes of their class time to explain to students the purpose of the research and the way the questionnaires were to be applied.

The UFS Medical Academic Center (CAMED/UFS) was invited to the survey and helped to distribute it, as well as to collect the data from the freshmen during their welcome, before their first exposure to the medical course.

A diligent search for the few students who were absent at the time of data collection was made. We excluded only those who had refused to take part in the survey even after they had been told about it and its importance.

## 5. Research instruments

A self-administered questionnaire by the authors, with 54 closed pre-codified questions, relating to socio-demographic characteristics, the teaching-learning process, personal aspects linked to choice of profession and to psycho-emotional experiences in the last month, was used.

The SRQ-20<sup>7</sup> which is a scale for assessing anxiety, depression and somatoform symptoms, used by the WHO for "screening" CMD in populations in primary health care service, was also applied.

This is a self-administered instrument validated in Brazil, showing index of sensibility (89%), specificity (81%), positive predictive value (81%), negative predictive value (82%) and classification error (19%), which is considered very satisfactory for similar studies on primary health care.<sup>1</sup> In one particular study with workers, the general internal consistency and standardized coefficient was 0.80.<sup>10</sup> This result points to an acceptable performance of the SRQ-20 to assess common mental disorders in an occupational ambit.

The SRQ-20 questionnaire has 20 binary response questions. The preceding 30 days were considered in this study. A score larger than or equal to 6 for men and larger than or equal to 8 for women is considered a probable case. The best cut-off point for this research was determined from the original work, from other studies with medical students, and from our pilot study.<sup>1,11,12</sup>

In this study the association between dependent variable (CMD) and the explanatory variables (semester, gender, age, steady partner, religion, provenance, family income, living with whom, other occupation, satisfaction with career choice, expectations of the course, whether student has ever considered abandoning the course, academic performance, acquisition of skills to become a good doctor, satisfaction with teaching strategies, feelings in relation to course activities, presence of physical disease, presence of previous mental disorder, self-medication, self-evaluation of emotional tension, course as a source of enjoyment, free time, emotional support, expectations

about the future, feelings of happiness) was investigated through the calculation of a simple and adjusted odds ratio (OR).

The privacy of the students was respected during data collection. They were seated apart from each other in the classroom, after they had been informed in detail about the research and had their doubts about the questionnaires clarified by the research support team. When the students gave the questionnaires back to the support team, they detached the page relating to the consent form and gave it to the researchers, while the questionnaire, without identification, was placed in a sealed ballot box.

## 6. Data analysis

The data analysis was carried out using the SPSS version 16 software application through the following stages:

1<sup>st</sup> - Population description through Descriptive Statistics. Inferential Statistics are not suitable for this study, since we have studied the entire population instead of an aleatory sample;

2<sup>nd</sup> - Simple analysis; construction of tables; initial calculation of prevalence ratios (PR) that is an appropriate measure of association for cross-sectional studies and later calculation of odds ratio (OR) because is the measure obtained in the logistic regression (final step of our analysis) and can also be used in this type of study;

3<sup>rd</sup> - Multivariate analysis by logistic regression. The selection criteria of variables is based on the importance of the variable in literature, on the authors' experience, and on the OR magnitude. The variables showing association with CMD > 30% remained in the final model.

After the calculation of general prevalence and the comparison of prevalence by semester the freshmen were excluded from the calculations at the time of the associated risk factors examination, as they had answered the questionnaires before attending any classes, and therefore were not yet exposed to the course, serving as an initial reference point for comparison with the students of subsequent semesters; in other words, with those already exposed.

## 7. Ethical considerations

The study was submitted to the Ethics Committee of Research on Human Beings of the Federal University of Sergipe (UFS) and approved according to CAE protocol number 0018.0.107.000-06. The participants signed a free and informed consent form, and the names in the qualitative results are fictional. All proposed and approved ethical procedures were strictly followed by the research team.

## Results

Thirty-nine students out of the total target population (512), refused to participate in the study, which means that 92.4% of the students (473) enrolled in the course took part in the survey. The loss of 7.6% occurred both in the internship (2.3%) and in the other semesters (5.3%) with no difference in sex distribution among the survey participants and the target population. The prevalence of CMD in the studied population was 40.0%, 40.3% for females and 39.6% for males. We observed a slight predominance

**Table 1 – Distribution of medical students according to initial motivation related to professional choice. Aracaju (SE), 2006**

Professional choice motivation	n (%)
Influence of others	9 (1.9)
Better labor market	64 (13.7)
Desire to help others	244 (52.1)
Do not know the reason	54 (11.5)
Experience of illness in themselves or in family	14 (3.0)
Others	83 (17.7)
Total	468* (99.9%)

\* 5 Missing

of women (50.3%), and a predominance of young people under 23 years (64.2%); the majority were living with their parents (82.9%).

Of the total studied population, 53,3% reported that they already had a doctor in their family; five students did not answer this question. When they referred to the motivation for their career choice, 52.1% reported that what made them choose the medical course was the desire to help others. On the other hand, only 1.9% referred to the influence of others (Table 1).

The univariate analysis, using the positivity for CMD based on SQR-20 as a dependent variable (outcome) and using only the semesters as an independent variable, showed a strong association for this to occur in later semesters rather than in the first semester, showing a bigger value in the ninth semester and in the internship period: the fourth, fifth, sixth, seventh, eighth, ninth, tenth and internship (Table 2).

When we take the 40 freshmen out of the population, a increase of 42.5% in the prevalence of CMD occurs: 42.8% for females and 42.2% for males. The following data are based on a student population from the 2<sup>nd</sup> to the 12<sup>th</sup> semester (n = 433).

We observed a predominance of men, students with a steady partner, students professing adherence to a religion, and from the capital.

In the univariate analysis of the socio-economic and demographic variables, we found an increased chance of developing CMD in those students from the hinterland and in those levels of family income ranging from 1 to 5 minimum wages and from 11 to 15 minimum wages (Table 3).

**Table 2 – Distribution of medical students according to course period and prevalence of CMD, Aracaju (SE), 2006**

Period	Prevalence of CMD (%)	Crude OR
First (n = 40)	12.5	1
Second (n = 36)	19.4	1.69
Third (n = 32)	31.3	3.18
Fourth (n = 35)	37.1	4.13
Fifth (n = 33)	45.5	5.83
Sixth (n = 38)	34.2	3.64
Seventh (n = 38)	44.7	5.67
Eighth (n = 36)	38.9	4.46
Ninth (n = 39)	51.3	7.37
Tenth (n = 46)	45.7	5.88
Internship (n = 100)	54.0	8.22

**Table 3 - Distribution of students from UFS medicine course according to demographic, socioeconomic variables and prevalence of common mental disorders, Aracaju (SE), 2006**

Variables	N	%	CMD (%)	Crude OR
<b>Total</b>	433	100.0	42.5	
<b>Sex</b>				
Female	215	49.7	42.8	1.02
Male	218	50.3	42.2	
<b>Age (years)</b>				1.11
<b>Steady partner</b>				
Yes	280	65.4	40.7	1
No	148	34.6	45.9	1.24
Missing	5			
<b>Religion</b>				
Yes	359	84.1	41.2	1
No	68	15.9	51.5	1.51
Missing	6			
<b>Provenance</b>				
City	299	69.7	39.5	1
Hinterland	62	14.5	59.7	2.27
Other states	68	15.8	38.2	0.950
Missing	4			
<b>Family income (Minimum wage)</b>				
1 to 5	36	11.6	52.8	2.43
6 to 10	80	25.9	45.0	1.78
11 to 15	75	24.3	49.3	2.12
16 to 20	64	20.7	45.3	1.80
More than 20	54	17.4	31.5	1
Missing	124			
<b>Living with</b>				
Relatives	394	91.4	41.6	1
Friends/colleagues	13	3.0	46.2	1.20
Alone	24	5.6	54.2	1.66
Missing	2			
<b>Have other occupation</b>				
Yes	75	17.4	45.3	1.15
No	355	82.6	42.0	1
Missing	3			

Regarding the course and academic performance, the studied population revealed the following: 81.7% considered that their academic performance was excellent or good, 53.1% stated that the course had disappointed them; 71.6% considered themselves satisfied with their career choice; 36.3% reported that they had already thought about leaving the course at some point during their undergraduate course.

The majority of the students (75.1%) believed that they were acquiring the skills to become a good doctor, but only a minority of them (6.0%) were satisfied with the teaching methods. More than half (52.6%) of them felt uncomfortable with the activities of the course (Table 4).

We identified that 82.1% of the students considered the course as a source of enjoyment, while 70.4% considered themselves to be suffering from tension (Table 5). Among these, 33.9% stated that the greatest source of tension was the teacher–student relationship, followed by the lack of good working conditions, reported by 10.5%. On the other hand,

among those who thought the course pleasurable (38.3%), the recognition of patients and relatives was identified as the greatest source of pleasure.

For the variables related to personal aspects, the prevalence of CMD was high among the students who reported having a mental disorder diagnosed by a psychiatrist, being self-medication users, being emotionally tense, reacting to conflicts in an aggressive or passive way, not considering the course as a source of enjoyment. The presence of physical disease and the reduction of free time pointed also to an increase of CMD.

Psycho-emotional aspects expressed in hope about the future and self-assessment of happiness were associated with a increased risk for CMD, more evident in those who did not feel happy and in those with low expectations about the future. The lack of emotional support was also associated with increased risk for CMD (Table 5).

The following variables related to career choice and the teaching–learning process are correlated with an increased chance of developing CMD: satisfaction level with the career choice,

**Table 4 - Distribution of medical students according to variables related to professional choice, teaching-learning process and prevalence of common mental disorders, Aracaju (SE), 2006**

Variables	N	%	CMD (%)	Crude OR
<b>Total</b>	433	100.0	42.5	
<b>Satisfaction with career choice</b>				
Yes	310	71.6	36.5	1
No	123	28.4	57.7	2.38
<b>Expectations regarding the course</b>				
Matched expectations/more than expected	202	46.9	28.2	1
Less than expected	229	53.1	55.5	3.17
Missing	2			
<b>Have you ever considered abandoning the course?</b>				
Yes	157	36.3	56.7	2.48
No	275	63.7	34.5	1
Missing	1			
<b>Academic performance</b>				
Not so good	79	18.3	58.2	2.17
Good/Excellent	353	81.7	39.1	1
Missing	1			
<b>Acquisition of skills to become a good doctor</b>				
Yes	316	75.1	33.2	1
No	105	24.9	70.5	4.80
Missing	12			
<b>Satisfaction with teaching strategies</b>				
Yes	26	6.0	7.7	1
More or less	197	45.5	36.0	6.76
No	210	48.5	52.9	13.5
<b>Feeling in relation to course activities</b>				
Comfortable	177	41.4	22.6	1
Less comfortable	225	52.6	54.7	4.13
Uncomfortable	26	6.1	76.9	11.4
Missing	5			

expectations about the course, desire to abandon the course, self-evaluation of academic performance, self-perception of skills acquisition to become a good doctor, satisfaction with the teaching strategies and feelings about the school's activities.

The variables used for adjustment in the multiple logistic regression analysis were: semester, sex, age, steady partner, religion, provenance, family income, living with whom, other occupation, satisfaction with career choice, expectations regarding the course, feelings in relation to course activities, self-evaluation of emotional tension, reaction to conflicts in relationships, feelings of happiness, self-evaluation of skills acquisition to become a good doctor, whether had ever considered abandoning the course, academic performance, satisfaction with teaching strategies, presence of physical disease, presence of prior mental disorder, self-medication, course as a source of pleasure, free time, emotional support, expectations about the future.

The variables associated with CMD that remained in the final model after adjustment in multiple logistic regression analysis,

were: negative self-perception about acquiring the skills required to become a good doctor, feelings of discomfort in relation to the activities of the medical course, expectations regarding the course, presence of mental disorder with prior diagnosis, diagnosis of emotional tension, and feelings of unhappiness. In this final stage of analysis 95.2% (n = 412) of students participated (Table 6).

## Discussion

The prevalence of CMD in the students of medicine at UFS was higher than the prevalence in the Brazilian population,<sup>4,5,8</sup> of the industrialized<sup>2</sup> countries, and than that found in students of dentistry and nursing.<sup>11</sup> Some Brazilian studies with students of medicine show a prevalence lower than,<sup>15</sup> and others, a prevalence similar to, that found in this study.<sup>11,12</sup> The stressful situations which the medical students are exposed to during their course may be responsible for the larger prevalence of CMD among them. It is possible that factors related to the differences in the infrastructure of each medical course from the several schools where the studies

**Table 5 – Distribution of medical students according to variables related to personal aspects, psycho-emotional/support experiences and prevalence of common mental disorders, Aracaju (SE), 2006**

Variables	N	%	CMD (%)	Crude OR
<b>Total</b>	433	100.0	42.5	
<b>Presence of physical disease</b>				
Yes	54	12.5	53.7	1.68
No	377	87.5	40.8	1
Missing	2			
<b>Presence of mental disorder with prior diagnosis</b>				
Yes	26	6.0	69.2	3.27
No	407	94.0	40.8	1
<b>Self-medication</b>				
Yes	30	7.1	66.7	2.85
No	393	92.9	41.2	1
Missing	10			
<b>How do you consider yourself emotionally?</b>				
Calm	128	29.6	24.2	1
Tense	304	70.4	50.3	3.17
Missing	1			
<b>Reaction to conflicts in relationships</b>				
You dialogue/you keep calm and indifferent	221	51.5	32.1	1
You retract	122	28.4	50.8	2.18
You react aggressively/ other reactions	86	20.1	59.3	3.08
Missing	4			
<b>Course as a source of pleasure</b>				
Yes	354	82.1	40.4	1
No	77	17.9	53.2	1.68
Missing	2			
<b>Free time</b>				
Less than 4 hours	82	19.1	50.0	1.60
From 4 to 6 hours	119	27.7	45.4	1.33
More than 6 hours	229	53.3	38.4	1
Missing	13			
<b>You receive the emotional support you need?</b>				
Yes	267	62.1	40.1	1
More or less	119	27.7	45.4	1.24
No	44	10.2	50.0	1.50
Missing	3			
<b>Expectations for the future</b>				
Very good	145	33.6	28.3	1
Good	243	56.3	45.7	2.13
Not so good	44	10.2	72.7	6.76
Missing	1			
<b>Do you feel happy?</b>				
Yes	375	87.6	37.1	1
No	53	12.4	83.0	8.30
Missing	5			

were performed have a direct effect on the teaching–learning process and consequently on the prevalence of CMD.

We observed that the data losses of the studied population were small and did not have any influence on the results since, even if

the students who did not want to take part in the research were not probable cases of CMD, according to SQR-20, even so the prevalence of CMD in our study would have remained high, revealing that the problem is relevant.

Unlike in other studies,<sup>6,8,9,16,17</sup> only the socio-economic and demographic variables “income from 1 to 5 minimum wages and from 11 to 15 minimum wages”, “provenance from the hinterland”, and “age” showed a strong association with CMD in the univariate analysis, while “sex”, “religion”, “having a steady partner”, “having another occupation” or “living alone” did not show any association. It is possible that the differences in these variables among individuals of the group studied are small, making them lose their importance in comparison with other variables. There is a vast literature showing that women have proportionately higher rates of stress and depressive symptoms, considering both the general population and the population of students of medicine.<sup>18-22</sup> In our study the difference in sex did not show up as being of major importance. Being female, however, seems not to be a risk factor *per se*, but the environment and social support are, in most cultures. An explanation for the apparent difference between the sexes is the lesser likelihood of men seeking out a doctor when they feel unhappy.<sup>23</sup>

In this study we observed that there was no association between CMD (despite the fact that it points to an upward trend) and lack of religion, reported by 15.9% of the students, although religion may have some influence, since researchers<sup>24</sup> have demonstrated that spiritual well-being acts as a protective factor for minor psychiatric disorders.

Most of our students lived with relatives and were from the capital. However, those who were from the hinterland showed a higher risk for CMD, which did not occur among those from other states. This finding suggests some questions which current research has no power to answer: is it possible that the students from the hinterland that who continue to live with their parents are exhausted by the daily commute from their towns to the capital? Is it possible that the students from other states, once they are away from home, mature faster and structure their defenses better, becoming more independent?

In income levels, from 1 to 5 minimum wages and 11 to 15 minimum wages, the prevalence of CMD in the univariate analysis was important in the lowest levels of income, making us believe that the stress of paying for the medical course and even the stress of basic survival contribute to this finding. On the other hand, in those in the middle-income range the threat of losing their status due to the gradual flattening of the middle class may contribute to the finding. Several authors demonstrated that, in particular, low income and low education are associated with CMD in populations from developing countries.<sup>2,5,6,9,25</sup>

We found that the risk of CMD increased with age and the semester in which the student was. Although differences in age are small, the importance of semester change for an increase in the prevalence of CMD in students draws our attention. From the fourth semester on, this increase is important in the univariate analysis. Although this categorical variable does not remain in the final logistic regression model, it shows a trend of risk with the development of the course that should be better evaluated in future longitudinal studies, since the 5<sup>th</sup> period (beginning of the

**Table 6 – Outcome of the logistic regression for related variables and common mental disorders in medical students (n = 412), Aracaju (SE), 2006**

Variables	Crude OR	Adjusted OR
<b>Total</b>		
<b>Acquisition of skills to become a good doctor</b>		
Yes	1	
No	4.80	2.82
<b>Expectations regarding the course</b>		
Matched expectations/more than expected	1	
Less than expected	3.17	1.64
<b>Feeling regarding course activities</b>		
comfortable	1	
Less comfortable/ uncomfortable	4.53	2.65
<b>How do you consider yourself emotionally?</b>		
Calm	1	
Tense	3.17	2.14
<b>Presence of mental disorder with prior diagnosis</b>		
Yes	3.27	3.78
No	1	
<b>Do you feel happy?</b>		
Yes	1	
No	8.30	2.85

professional cycle), 9<sup>th</sup> period (before the beginning of internship) and the internship appear as the most problematic.

We believe that the increase of responsibility, workload, internal and external pressures, accumulation of losses, and the frustration mentioned in the qualitative study conducted in parallel,<sup>14</sup> contribute to an increase in the prevalence of CMD during the medical course.

More than half the studied population has some relative who is a doctor; however, few reported the influence of others in their career choice as a primary motivation. This suggests that even the presence of the doctor figure in their life, whether or not they are a relative, may influence students' choice, probably unconsciously. This is also mentioned in other studies<sup>26</sup> as the conscious motivation: the desire to help others and better job prospects and are more frequent, as mentioned by the students in this study.

The satisfaction with the choice of medicine referred to by most students, although more than half think the medical course is less good than expected and have already thought about leaving it at some time, reinforces the idea of intended choice that arises from the unconscious motivations by characteristics inherent in the personality of those who choose the course.

The poor academic performance was a factor indicating an increased risk for CMD. This is very important, even if this variable has not been maintained in multivariate analysis, since these disorders cause a decrease in concentration and consequently in memory, undermining the learning process and

being responsible for low academic performance, thereby creating a vicious cycle that may contribute to a performance phobia.<sup>27</sup> Inadequate school performance is used as an indicator of possible psychological maladjustment in specific situations, since school performance occupies a high position on the scale of values of students, and academic failures often lead to depressive reactions of greater or lesser intensity.<sup>28</sup>

The inability to develop the necessary skills to become a good doctor, a variable that remained in the final step of the logistic regression, is associated with an increased risk for CMD and like levels of academic performance it also creates a vicious cycle leading to the potentiation of symptoms consequent on low performance which is reported in other studies.<sup>13,28,29</sup>

Among the students surveyed, a few said that they were satisfied with the teaching strategies while more than half felt somewhat uncomfortable or uncomfortable with the school activities, which was associated with the higher prevalence of CMD in univariate analysis.

In our study, the students from the first to the third semesters of the course showed a prevalence of CMD on a level with that expected for the general population. The presence of prior mental disorder, diagnosed by a psychiatrist, was mentioned by some students in the questionnaires, which suggests other factors, associated with individual predisposition, rather than any factors related to the medical course.<sup>27,30</sup>

In a prospective study on the mental health of doctors, the authors<sup>31</sup> concluded that professionals with unstable adaptation in childhood and adolescence would show greater vulnerability to work demands. In another study, the authors say that the psychological unhealthy inherent to the practice of medicine may be an important triggering factor of emotional disorders in students, junior doctors and doctors who predisposed or especially vulnerable.<sup>28</sup>

We identified that recognition by the patients and the family, and a network of support, as against the difficult relationship with some teachers and the lack of working conditions referred to in questionnaires, are respectively sources of pleasure and discomfort that may induce us to think about preventive measures that would help to reduce the psychic suffering of our pupils and to reinforce the defensive strategies that maintain them in good mental health.

The results show that friends, colleagues, and relatives are asked to share students' difficulties at moments of tension. They look for some leisure activities, which we see as fundamental protectors of the mental health of the students.

The variables that remained in the final logistic regression model presented an odds ratio that approximately triples the risk for CMD. The major risks were for those who felt uncomfortable regarding the course activities, those who did not feel happy, those who considered themselves emotionally tense, those who had negative self-perception in the acquisition of the skills needed to become a good doctor, those who believed that the course was less good than expected, and those who had a prior mental disorder diagnosis by a psychiatrist. These variables suggest the role of the

teaching-learning process and of the individual's psycho-emotional aspects in the risk for CMD.

The cross-sectional studies have limitations in the attribution of causality for the associations found, since they analyze simultaneously outcomes and exposures. Despite this, they contribute enormously to the planning of preventive measures. Trying to reduce the limitations of this cross-sectional study, we performed a parallel qualitative study through focus groups with this same population, which may be released later, and its data reinforce and complement the quantitative data of this study. There is also in preparation a longitudinal study with the students of 2006/1 who participated in the first part of this survey.

It is up to us, professors of institutions in which doctors are undergraduates, to investigate the prevalence of mental disorders among our students, aiming to avoid the impairment of their mental health and trying to preserve it, reinforcing positive situations and the exercise of better defensive strategies. We should evaluate our participation as promoters of these positive experiences in the field of medical training.

Several studies<sup>11,12,29,32</sup> show the necessity of deep reflection on medical education by Medical Schools which must perform a critical evaluation of the training they offer, of how their students are developing their competences and skills, and, above all, of the responsibility of these schools in the generation of stress.

Only through gaining an overall broad profile of their students will it be possible for the Schools to set up adequate teaching and preventive mental disorder programs. Services that are today models of student psychotherapeutic help have been set up in some important Brazilian Universities<sup>33,34</sup> following the recommendations of earlier researches on the mental health of medical students.

## Conclusion

The high prevalence of CMD among students of medicine at UFS, associated with risk factors related to the teaching-learning process and with individual psycho-emotional aspects, revealed by this study, points to the necessity of changes in medical training and of structured preventive measures of mental health care for the aspiring doctor.

Qualitative studies like that performed by authors with this same population (proof-reading) will bring new contributions for a better comprehension of the findings presented here. Meanwhile, even more enlightening answers will come from the follow-up study that has been set in train since 2006 with the freshman class that participated in this research, and which has been evaluated each semester until the end of their internship. The completion of more studies of this nature, in other places involving medical students, will also contribute to the consistent verification of the results obtained in this study.

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Edméa Fontes de Oliva Costa	UFS UFBA	-	-	-	-	-	-
Tarcísio Matos de Andrade	UFBA	-	-	-	-	-	-
Annibal Muniz Silvano Neto	UFBA	-	-	-	-	-	-
Enaldo Vieira de Melo	UFS	-	-	-	-	-	-
Ana Carolina Aquino Rosa	UFS	-	-	-	-	-	-
Mariana Amorim Alencar	UFS	-	-	-	-	-	-
Ângela Maria da Silva	UFS	-	-	-	-	-	-

\* Modest

\*\* Significant

\*\*\* Significant. Amounts given to the author's institution or to a colleague for research in which the author has participation, not directly to the author.

Note: UFS = Universidade Federal de Sergipe; UFBA = Universidade Federal da Bahia.

For more information, see Instructions for authors.

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