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Factors associated with Burnout Syndrome in medical students

Helen Hana Fernandes Tavares*
Heloísa Rodrigues Soares da Silva *
Isabela Maria Melo Miranda*
Monise Santana Braga*
Raquel de Oliveira Santos*
Heloísa Silva Guerra*

Abstract

Burnout syndrome can be defined as a syndrome of emotional exhaustion, depersonalization and reduced personal fulfillment, related to high emotional demands at work. Burnout syndrome has also been observed in medical students, as they are exposed to several stressors. The number of studies involving aspects of the university public is still low which are crucial for development of research to elucidate the knowledge of this profile. The aim of this study was to identify the prevalence of Burnout syndrome among medical students and the factors associated with this condition. This was a cross-sectional study with 419 students enrolled from the second to the eighth semester of the medical course at a public university in the State of Goiás. The instruments used were the Maslach Burnout Inventory - Student Survey (MBI-SS) and a sociodemographic and lifestyle questionnaire. As a result, this study found that 9.5% of medical students had changes in the three dimensions of the instrument, suggesting the presence of Burnout syndrome, with scores for the dimensions of exhaustion, disbelief and professional effectiveness being 3.6; 1.7 and 4.3, respectively. Of the factors associated with this condition, the most prominent were the frequent use of stimulating substances, the use of tobacco and alcohol. Therefore, interventions are necessary with pedagogical and psychological support as well as encouraging family life, in order to minimize the possible negative impacts of this condition on students' lives.

Keywords: Psychological exhaustion. Medical students. Mental health.

INTRODUCTION

When it comes to mental health, items like subjective well-being are added to the autonomy and self-realization of the human being's intellectual and emotional potential[1]. This concept, when applying it to the work environment, indicates a loss of mental health due to stress and this is called *Burning out or Burnout*. The most used definition of Burnout was raised by Maslach and Jackson, which is a syndrome of emotional exhaustion, depersonalization and reduction of personal fulfillment, caused by the prolongation of situations of high emotional demands in the workplace and that can occur in professionals working in the area of human services[2].

Based on these three pillars, emotional exhaustion is the situation in which workers are unable to give more of themselves

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*Universidade de Rio Verde, Campus Aparecida, Aparecida de Goiânia, GO, Brasil
E-mail: heloisasguerra@gmail.com

at an emotional level. Concerning depersonalization, it is considered the increase of negative feelings and attitudes towards people related to work. Meanwhile, the reduction in personal fulfillment is related to a negative evolution at work, impairing their performance and care. In addition to these pillars, other symptoms may be present, such as: stress, tiredness, general malaise, irritability, restlessness, difficulty concentrating, paranoid and aggressive behaviors. Psychosomatic disorders, manifested through headache, digestive ulcers, arterial hypertension, sleep disorders and tachyarrhythmias[3], also stand out.

According to the definition of Burnout, its context is commonly inserted in the work environment; however, there has also been talk of Burnout Syndrome (BS) among university students. Some factors contribute to the appearance of the syndrome in this public, such as the fact that they may not live with parents or family members, they may be are single, may be sedentary, may not perform leisure activities, may not be in their preferred university course due to their entrance exam scores, may perform extracurricular work, may have the desire to drop out of the course and may have mental disorders[4].

In this context, medical students are vulnerable to BS, as they are exposed to several stressors. The speed with which information emerges today requires a quick adaptation of the student, in view of competitiveness. Thus, the unlimited search for knowledge overloads the victims of this system, who end up sacrificing their quality of life in order to meet the demands of teachers, colleagues and society[5].

Medical students enter the course with many expectations, however, as the course progresses, complaints begin to arise related to the volume of content, scarce time for rest and leisure, physical and mental tiredness, in addition to contact with stressful and sad situations[6] .

Stress, anxiety and depression are some of the most common mental problems described among medical students, which are factors that can lead to BS and negatively impact quality of life. Such a situation generally leads to discouragement and reduced academic performance[5].

Epidemiological studies show the relationship between the academic environment, especially in the medical course, with the prevalence of BS. Research involving medical students showed an 11.4% prevalence of BS, revealing an increased occurrence of emotional exhaustion, disbelief and low levels of professional effectiveness during the course. Factors that have been identified as influential in the evolution of this syndrome include: emotional immaturity, discrepancy between expectation and reality, shock with intense academic life, insecurity due to little practical preparation, high demand for time for extracurricular activities, as well as the degree of demand of university professors[7].

BS is prevalent during medical school, and half of the students may be affected by this syndrome during the course[8]. In China, more than 40% of medical students have moderate or higher levels of burnout[9]. A systematic review conducted in Brazil showed a BS prevalence of 13.1% (95% CI 10.2-16.4) among Brazilian medical students[10].

A survey with medical students from the Physician Masterfile of the American Medical Association (AMA) assessing alcohol abuse/dependence, Burnout, depression, suicide, quality of life (QOL) and fatigue, showed that 32.4% of these students met criteria for abuse of alcohol and illicit substances, and the students who displayed the predominant symptoms of Burnout were more likely to be in this group, in addition to the increased frequency of suicidal thoughts[11]. BS in medical school has the potential to negatively impact students' academic development

and well-being, which are independent and significant predictors of suicidal ideation and dropout from medical school[8].

BS can start in the academic period and persist in the individual's professional life, which makes it fundamentally important to detect this condition early to avoid future losses. Mapping medical students' health conditions is justified by the peculiarities inherent to this group, in addition to allowing educational institutions themselves to develop preventive interventions and protocols to cope with the syndrome that positively impact their well-being, performance and quality of life.

Although a transversal approach is proposed, considering only one institution, studies like this can contribute to the knowledge of a specific group regarding BS, but together with other studies that have been and will be developed over the next few years in this field, they can provide a situational panorama of BS among medical students and allow institutional policies aligning with their reality to be developed and instituted.

That said, the guiding research questions were: what is the prevalence of BS in medical students from a public foundation in the State of Goiás? And what are the factors associated with BS in these students? Therefore, the aim of this study was to identify the prevalence of Burnout Syndrome among medical students and the factors associated with this condition.

METHODOLOGY

This was a cross-sectional study, carried out with students from the second to the eighth semesters of the undergraduate medical course at a public institution in the city of Aparecida de Goiânia (GO). Inclusion criteria were students that were 18 years of age or older and duly enrolled in the course.

To make data collection operational, two instruments were used: a sociodemographic and lifestyle habits survey and the Maslach Burnout Inventory - Student Survey (MBI-SS).

The Maslach Burnout Inventory - Student Survey (MBI-SS), was designed to assess Burnout Syndrome in students. The instrument consists of 15 questions divided into three subscales: Emotional Exhaustion (EE) composed of 5 items; Disbelief/ depersonalization (DE) composed of 4 items and Professional Effectiveness (PE) composed of 6 items12. Burnout rates are assessed according to the scores for each dimension, which are high scores on Emotional Exhaustion and Disbelief and low scores on Professional Effectiveness, according to an inverse subscale which indicates a high level of Burnout.

The data were analyzed using the STATA13 program, version 14.0. Initially, the Kolmogorov-Smirnov test with Lillifors correction was performed to verify the normality of the quantitative variables of the study. Next, a descriptive analysis of the variables was carried out. Qualitative variables were presented as absolute (n) and relative (%) and quantitative variables as mean and standard deviation (SD), minimum and maximum. For the dimensions of the instrument, the median was also presented, 95% CI of the mean and interquartile range (IQR).

For the analysis of the reliability and internal consistency of the MBI-SS instrument, Cronbach's alpha coefficient and the intraclass correlation coefficient (ICC) were used.

All quantitative variables were normal and parametric tests were used for the analysis of statistical inference. To verify the factors associated with the dimensions of Burnout Syndrome in medical students, bivariate and multiple analyses were performed. In the bivariate analysis, Student's t tests for independent samples or analysis of variance (ANOVA) were used to compare the mean scores of the Burnout dimensions between the nominal and ordinal variables, respectively.

Next, a multiple linear regression analysis was performed with Burnout dimensions as dependent variables. Variables with p-value <0.20 and sex and age were included in the regression models as potential confounding variables. In all analyses, p-values <0.05 were considered statistically significant.

The study was approved by the Research Ethics Committee of the Foundation for Higher Education of Rio Verde - FESURV - University of Rio Verde through Opinion No. 2.288.371, CAAE 69111317.0.0000.5077.

RESULTS

419 students were interviewed, most of whom were female (64.7%), with an average age of 22.1 years (SD = 4.3 years) and single (96.2%). Among the students, 58.9% performed extracurricular activities, 25.1% reported using stimulating substances sometimes and 9.3% always used them. About 28.6% thought about giving up the course, 50.4% slept well almost always, 33.9% sometimes and a total of 53.2% felt able to manage stress almost always.

Regarding lifestyle habits, 61.3% did not consume fruits and vegetables as recommended; 40.3% consumed hypercaloric foods; 59.7% practiced physical exercises on a regular basis; 95.7% never smoked; 62.5% used alcohol and 17.4% reported having some type of pathology.

Table 1 presents the analysis of the dimensions of the Burnout scale in medical students. It was observed that the average scores for the exhaustion, disbelief and professional effectiveness dimensions were 3.6, 1.7 and 4.3, respectively.

Table 2 shows the prevalence of Burnout syndrome, according to dimension and overall. The syndrome was considered as the presence of changes in the three dimensions. Of the total number of students, 9.5% (95% CI: 7.1-12.7) showed changes in the three dimensions, suggesting the presence of Burnout syndrome.

In the multiple linear regression analysis of the factors associated with Burnout Syndrome (table 3), it was found that the older the age, the lower the symptoms of emotional exhaustion (□ = -0.039; p-value = 0.009).

Use of stimulants “always” was positively associated with symptoms in the emotional exhaustion domain (ß = 0.519; p-value = 0.001). This result suggests that the regular use of these substances increased the symptoms of this domain in medical students. Being a former smoker was negatively associated with the professional effectiveness domain (□ = -1.023; p-value <0.001). Even so, being a smoker was positively associated with the disbelief domain (ß = 0.988; p-value = 0.020) and negatively with the professional effectiveness domain (ß = -0.608; p-value = 0.033), indicating that smoking increases the symptoms of these two domains.

Alcohol use was positively associated with the disbelief domain (ß = 0.286; p-value = 0.027) and negatively associated with the professional effectiveness domain (ß = -0.314; p-value <0.001), indicating that the use of this substance increased the symptoms these two domains.

Thinking about giving up the course was positively associated with the emotional exhaustion and disbelief domains and negatively associated with the professional effectiveness domain. It was observed that the longer the hours of sleep, the lower the symptoms of the professional exhaustion domain were (□ = -0.189; p-value <0.001).

Finally, there was a negative association between stress management and emotional exhaustion and disbelief, and a positive one association with professional effectiveness. This indicates that the better or more positive the student’s stress management was, the lower the symptoms of all domains were.

Table 1 – Analysis of the dimensions of the Burnout scale of medical students. Aparecida de Goiânia -GO, 2018.

Dimensions	Mean (SD)	CI 95%	Median	IQR	Value MIN. MAX.	Cronbach's alpha	CCI	p-value*
Exhaustion	3.6 (1.2)	3.4-3.7	3.6	2.8-4.4	0.4-6.0	0.838	0.836	<0.001
Disbelief	1.7 (1.4)	1.5-1.8	1.2	0.5-2.2	0.0-5.7	0.869	0.870	<0.001
Efficiency	4.3 (0.9)	4.2-4.4	4.3	3.7-5.0	1.2-6.0	0.819	0.821	<0.001

Abbreviations: SD: Standard deviation; 95% CI: 95% confidence interval; IQR: Interquartile range; Min: Minimum; Max: Maximum; ICC: intraclass correlation coefficient; * F test

Table 2 – Prevalence of symptoms and Burnout syndrome among medical students. Aparecida de Goiânia -GO, 2018.

Variables	n	%	CI 95%
High Exhaustion	161	38.4	33.9-43.2
High Disbelief	123	29.4	25.2-33.9
Low professional effectiveness	137	32.7	28.3-37.3
Burnout syndrome	40	9.5	7.1-12.7

95% CI: 95% confidence interval.

Table 3 – Factors associated with the dimensions of Burnout syndrome in medical students, obtained in the multiple regression analysis. Aparecida de Goiânia -GO, 2018.

Domains	β	95% CI	p-value
Emotional exhaustion			
Age (years)	-0.039	-0.069; -0.009	0.009
Sex			
Male (R)			
Female	0.187	-0.035; 0.401	0.098
Marital status			
Without partner (R)			
With partner	0.096	-0.549; 0.741	0.769
Use of stimulants			

to be continued...

...continuation- Table 3

Domains	β	95% CI	p-value
Never (R)			
Sometimes	0.215	-0.26; 0.456	0.080
Always	0.519	0.157; 0.883	0.005
Think about giving up the course			
No (R)			
Yes	0.433	0.200; 0.666	< 0.001
Recommended consumption of fruits/ vegetables			
No (R)			
Yes	-0.070	-0.286; 0.145	0.521
Pathology			
No (R)			
Yes	0.083	-0.190; 0.358	0.549
Use of alcohol			
No (R)			
Yes	-0.168	-0.380; 0.044	0.121
Periodically	0.047	-0.004; 0.979	0.073
Hours of sleep	-0.189	-0.293; -0.087	**< 0.001**
Stress management	-0.444	-0.585; -0.302	**< 0.001**
F value (p-value): 12.77 (<0.001)			
R2: 0.274			
R2 adjusted: 0.253			
VIF: 1.19			
Disbelief			
Age (years)	-0.015	-0.048; 0.189	0.386
Sex			
Male (R)			
Female	-0.057	-0.326; 0.201	0.671

to be continued...

...continuation- Table 3

Domínios	β	IC 95%	p-valor
Marital status			
Without partner (R)			
With partner	-0.272;	-1.031; 0.486	0.552
Use of stimulants			
Never (R)			
Sometimes	0.087	-0.199; 0.373	0.552
Always	-0.088	-0.523; 0.348	0.692
Think about giving up the course			
No (R)			
Yes	1.148	0.874; 1.424	**< 0.001**
Regular consumption of fruits / vegetables			
No (R)			
Yes	-0.014	-0.274; 0.246	0.915
Consumption of high calorie foods			
No (R)			
Yes	0.182	-0.068; 0.431	0.153
Regular exercise			
No (R)			
Yes	-0.124	-0.382; 0.134	0.344
Smoking			
Never (R)			
Ex smoker	0.226	-0.629; 1.081	0.603
Smoker	0.988	0.157; 1.820	0.020
Alcohol			
No (R)			
Yes	0.286	0.033; 0.539	**0.027**
Hours of sleep	0.010	-0.110; 0.131	0.866
Stress management	-0.346	-0.512; -0.179	**< 0.001**
F value (p-valor): 9.22 (< 0.001)			
R2: 0.246			
R2 adjusted: 0.216			
VIF: 1.18			
Professional effectiveness			
Age (years)	0.005	-0.014; 0.024	0.610
Sex			
Male (R)			
Female	-0.014	-0.189; 0.160	0.871
Think about giving up the course			
No (R)			
Yes	-0.419	-0.602; -0.236	< 0.001
Consumption of high calorie foods			
No (R)			
Yes	-0.188	-0.351; -0.026	0.023
Smoking			
Never (R)			
Ex smoker	-1.023	-1.586; -0.462	**< 0.001**
Smoker	-0.608	-1.167; -0.049	**0.033**
Alcohol			
No (R)			
Yes	-0.314	-0.480; -0.148	**< 0,001**
Periodically	0.038	-0.001; 0.077	0.053
Stress management	0.185	0.077; 0.294	**0.001**
F value (p-valor): 10.40 (< 0.001)			
R2: 0.186			
R2 adjusted: 0.168			
VIF: 1.06			

Abbreviations: 95% CI: 95% confidence interval; R: Reference category; β: regression coefficient; VIF: Variance Inflation Factor – this test indicates presence or absence of collinearity (the presence of a VIF> 0.4 indicates presence of collinearity); R2 and R2 adjusted: coefficient of determination (indicates the explanatory power of the model).

DISCUSSION

The profile of the students evaluated in this study was similar to those found in the literature, with the majority being female, single, with an average age between 22 and 23 years[14,15]. These findings reflect the feminization of medical courses, which has been a trend in recent decades16. In the literature, it is possible to observe differences in relation to sex when it comes to BS, with some studies showing a higher prevalence in females[17,18] and others in males[10,19].

In this sample, it was found that 9.5% of medical students had changes in the three dimensions of the Burnout assessment instrument, suggesting the presence of the syndrome. The findings corroborate with other Brazilian studies, such as the one carried out in Fortaleza (CE), which found a prevalence of 14.9% among the 376 students evaluated. Also, another study developed in the interior of Minas Gerais with 342 students found a BS prevalence of 11.4%; and another

to be contiued...

study carried out with 399 medical students from Anápolis, (GO) whose SB index was 12.0%[7,20,21]. However, when compared with the international literature, there is a much more significant prevalence of BS in other countries, such as 57.2% in Peru[22], 67% in Saudi Arabia[23] and 38% in Spain[16]. These differences may be related to cultural aspects, as well as the pedagogical management of educational institutions[21].

The results found in this study, considering the dimensions of emotional exhaustion (EE) and disbelief (DE), confirm what was demonstrated in a narrative review carried out in 2016, where it was found that 35% to 45% of medical students had overwhelming emotional exhaustion and 26% to 38% had a high degree of depersonalization (disbelief)[24]. The data presented by Aguiar, Aguiar and Merces (2018)[25], on the other hand, demonstrated that emotional exhaustion is present in 70.9%, disbelief in 56.3% and professional achievement in 29.1% of students, values much higher than those found in present study for EE and DE. This suggests differences in the competitiveness of each region, impressive curriculum requirements for entering a good medical residency program and the number of places available for residencies[23]. High rates of emotional exhaustion may be related to poor adaptation to difficulties, leading to academic disinterest and dissatisfaction and even indifference, increasing disbelief, which will be manifested in the limitation of professional achievement[25].

In the present study, age was associated with BS, and the older the age, the lower the symptoms of emotional exhaustion. This association can be explained by emotional immaturity, the high demand of the medical course with long hours, information overload, idealization of the importance of the doctor and the medical student, incompatibility between expectations about the course and the reality of the academic routine[7,25]. Other studies have not demonstrated the relationship between BS and age[26,27].

When evaluating the use of brain stimulating substances by medical students, it was observed that 25.1% of the students reported their use, with 9.3% using them "always", and that the symptoms in the EE dimension were positively associated with the use of these stimulants "always". Similarly, a Colombian study found a higher frequency of consumption of energy drinks among students who suffer from BS, as a stimulus to cope with sleep loss and increase their academic development[17]. Other reasons can lead students to use psychostimulants, among them the desire to improve reasoning, attention and memory stands out, one of the effects of their use is the increase in stress, which can contribute to the increase of EE in these students.

A similar study showed that student smokers had higher rates of anxiety and depression, as well as the presence of a relationship between smoking and psychiatric disorders[29]. In the present study, there was also a positive relationship between being a smoker and the presence of symptoms of DE and lower PE, the latter being also associated with being a former smoker.

Regarding alcohol abuse, the data in the present study showed an increase in the symptoms of the DE and PE domains. Alcohol abuse/dependence in medical students is associated with BS, high emotional exhaustion and high depersonalization[7]. Moreover, the dangerous use of alcohol by medical students in the South of Rio de Janeiro was shown to make carrying out their usual activities more difficult[30].

Thinking about giving up the course was positively related with the EE and DE domains, and a negatively related with the PE domain. In a study carried out in Pakistan, it was noticed that medical students with doubts and were dissatisfied with the course, are more likely to suffer from psychological

problems and stress when compared to those who do not have these doubts[31]. A study that evaluated nursing students showed that the probability of presenting BS was four times higher among students who thought about giving up the course than among those who did not consider this possibility[32].

Although no significant relationship was found between the practice of physical activity and the lower occurrence of BS in this study, research carried out with medical students from a private institution in Barretos showed a significant association between low physical activity and burnout[33]. Physical activity is among the strategies for coping with BS identified by the literature[34,35].

Regarding the hours of sleep, it was observed in the present study that the greater the amount of hours of sleep, the lower the EE. This finding is important because there is an increase in the level of exhaustion as a consequence of sleeping less time, in addition to a positive relationship between BS domains and sleep difficulties with a decrease in psychological and physical well-being among medical students[36].

Stress in medical students is related to a lot of study, lack of time for recreation, lack of sleep, fear of failure, high competition, and a lack of recognition for their work. Meanwhile, BS is associated with lack of leisure, fear of failure and the uncertain future; therefore, stress and BS have common factors[31]. The combination of the demands of medical education and stress can deplete students, which can be seen in this study when it is found that greater stress management by the student allows less symptoms of the EE and DE domains to be manifested, and is positively associated with PE.

The insertion of tools to deal with problems related to stress and BS are important in the academic field. Similar to what is done in the occupational sphere, various techniques such as training of coping skills, assertiveness, problem solving, time management, cognitive restructuring, psychoeducation and mindfulness, could be used to manage stress in students[37].

This is the first study that evaluated BS in a public foundation in the Brazilian Midwest Region, and in this sense, it is expected to contribute to a better understanding of the factors that are associated with the occurrence of the syndrome in medical students in that region. Brazil has 342 medical schools that offer of 35,388 vacancies annually[38]. The low amount of research with university students highlights an important gap in the literature on various aspects of this portion of the adult population. From the survey of information such as this study, institutional policies can be created and targeted to groups more predisposed to Burnout syndrome.

CONCLUSION

The prevalence of Burnout syndrome among medical students in this study was 9.5%. These findings suggest the need for interventions aimed at pedagogical and psychological support, in order to guide students concerning their difficulties and insecurities. Encouraging family life, increase in the number of psychosocial care professionals as a way to prevent stress in medical students, support groups at universities, in addition to conducting tests for early identification of the syndrome or other psychological pathologies arising from the stress common to academic life, are particularly important.

Studies that scan vulnerability and mental health are fundamental for planning and developing integrated actions for the prevention and treatment of university

students through the university itself. Thus, the academic environment could positively influence the pedagogical process, welcoming students in a more humane way. It is necessary to carry out new studies for BS research in medical students, mainly relating to their quality of life, which is fundamental for the construction of new educational proposals.

The study's limitation was the fact that it was transversal, which hindered a more comprehensive analysis during the course. A longitudinal approach in future research could bring a more detailed assessment of the evolution of students on the academic path, marking the opportune moments for an intervention in order to reduce the effects of BS and its incidence. Studies that highlight the role of the most effective interventions in preventing BS in medical students are also recommended.

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