

## BURNOUT SYNDROME IN MEDICINE STUDENTS AT A FEDERAL UNIVERSITY IN SÃO PAULO

### *SÍNDROME DE BURNOUT EM ESTUDANTES DE MEDICINA DE UMA UNIVERSIDADE FEDERAL EM SÃO PAULO*

### *SÍNDROME DE BURNOUT EN ESTUDIANTES DE MEDICINA DE UNA UNIVERSIDAD FEDERAL DE SÃO PAULO*

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**ABSTRACT:** Burnout Syndrome is a psychological condition that affects mainly health professionals, including physicians, and can begin during the student's graduation period. The study aimed to analyze the Burnout Syndrome in students of a medical course of a federal university in the state of São Paulo. 94 students were interviewed between the 1st and 4th year of the medical course using the Maslach Burnout Inventory - Student Survey (MBI-SS) questionnaire. The questionnaire collection consisted of 15 questions that are subdivided into three subscales: Emotional Exhaustion (EE) (5 items); Disbelief (DE) (4 items) and Professional Effectiveness (PE) (6 items). Of the sample, 23.4% (n = 22) of the students fit the Burnout three-dimensional diagnostic criterion. The pedagogical didactic structure used in the course may have an influence on the students' Burnout results, explaining the comparative differences with other studies.

**KEYWORDS:** Medical students. Academic burnout. Burnout. Brazil.

**RESUMO:** *A Síndrome de Burnout é uma condição psicológica que afeta principalmente profissionais da área da saúde, incluindo os médicos, podendo começar durante o período de graduação do estudante. O estudo teve como objetivo analisar a Síndrome de Burnout em estudantes de um curso de medicina de uma universidade federal no estado de São Paulo. Foram entrevistados 94 estudantes entre o 1º e 4º ano do curso de medicina com a utilização do questionário Maslach Burnout Inventory – Student Survey (MBI-SS). A coleta via questionário consistiu em 15 questões que se subdividem em três sub escalas: Exaustão Emocional (EE) (5 itens); Descrença (DE) (4 itens) e Eficácia Profissional (EP) (6 itens). Da amostra, 23,4% (n = 22) dos estudantes enquadravam-se no critério de diagnóstico tridimensional do Burnout. A estrutura didática pedagógica utilizada no curso pode ter*

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*influência nos resultados do Burnout dos estudantes, proporcionando a oportunidade de investigação para estudos futuros.*

**PALAVRAS-CHAVE:** *Estudantes de medicina. Esgotamento acadêmico. Burnout. Brasil.*

**RESUMEN:** *El Burnout es una condición psicológica que afecta principalmente a los profesionales de la salud, incluidos los médicos, y puede comenzar durante el período de graduación del estudiante. El objetivo del estudio fue analizar el Burnout en estudiantes de un curso de medicina de una universidad federal del estado de São Paulo. Se entrevistó a 94 estudiantes entre 1º y 4º año de la carrera de medicina mediante el cuestionario Maslach Burnout Inventory - Student Survey (MBI-SS). La colección de cuestionarios constaba de 15 preguntas que se subdividen en tres subescalas: Agotamiento emocional (EE) (5 ítems); Incredulidad (DE) (4 ítems) y Efectividad Profesional (EP) (6 ítems). 23,4% (n = 22) de los estudiantes cumplían con el criterio diagnóstico tridimensional de Burnout. La estructura didáctica pedagógica utilizada en el curso puede influir en los resultados del Burnout de los estudiantes, explicando las diferencias comparativas con otros estudios.*

**PALABRAS CLAVE:** *Estudiantes de medicina. Agotamiento académico. Burnout. Brasil.*

## Introduction

Burnout Syndrome, or simply Burnout, is characterized as a chronic state of emotional exhaustion, accompanied by a tendency to depersonalize others and a diminished sense of personal accomplishment, due to the scenario of prolonged work-related stress (MASLACH; SCHAUFELI; LEITER, 2001). Physicians are the professionals most likely to manifest Burnout symptoms, with 45.8% of all U.S. physicians reporting at least one symptom of the syndrome (SHANAFELT *et al.*, 2012). The scenario is worrisome because it can affect professional conduct, such as patient care (WOLF; ROSENSTOCK, 2017).

The problem can start in physicians as early as the undergraduate period (WOLF; ROSENSTOCK, 2017). A survey of students at seven medical schools in the U.S. identified that 49.6% of the sample was experiencing Burnout (DYRBYE *et al.*, 2008). Other studies, however, indicate that the number of medical students with Burnout in the US may be as high as 71% (FARES *et al.*, 2016). The consequences of such a scenario are serious, as students with Burnout are two to three times more likely to have suicidal ideation, and studies have shown that between 7.8 and 11% of medical students were reported with suicidal thoughts during graduation (MATHESON *et al.*, 2016; WOLF; ROSENSTOCK, 2017).

In the Brazilian context, the occurrence of Burnout in medical students still lacks investigations. According to a study conducted by Nassar, Andrade, and Arévalo (2018), only eight scientific articles have been done to evaluate the level of Burnout in medical students in

Brazil. Of the eight studies found by the authors' review, none had been done focusing on students from courses in the state of São Paulo. Thus, the present research aimed to investigate the level of Burnout Syndrome in 1st to 4th year medical students at a federal university located in the state of São Paulo.

### **Methodological Procedures**

The present study was duly approved in Ethics and Research Committee, with identification no. 81452117.0.0000.5393.

The study analyzed medical students from a Brazilian Federal University located in the Central-Eastern region of the state of São Paulo. Medical students from the 1st to the 4th year of the course who voluntarily agreed to participate and who were present on the days of collection were included. The 5th and 6th year students were excluded from the collection because they were in a period called "internship" by the university, no longer attending the university facilities, remaining at the hospital for practical classes. Because the change in the collection site could influence the research results, considering that a hospital is a highly emotional environment, it was decided to exclude them from the sample.

The data were obtained with the use of printed questionnaires containing the assessment instrument Maslach Burnout Inventory - Student Survey (MBI-SS). The MBI-SS is a valid adaptation by Schaufeli et al. (2002) of the Maslach Burnout Inventory. The version of the MBI-SS adapted and validated to Portuguese was carried out by Carlotto and Câmara (2006), using as additional input the Spanish and Portuguese versions from Portugal.

The instrument consists of 15 questions that are subdivided into three sub-scales: Emotional Exhaustion (EE) (5 items); Disbelief (DE) (4 items) and Professional Efficacy (PE) (6 items). Questions 1, 4, 6, 8 and 12 correspond to the EE sub-scale, questions 3, 5, 7, 11, 13 and 15 correspond to the EP sub-scale and questions 2, 9, 10 and 14 correspond to the DE sub-scale. All items are rated on a 7-point Likert scale, ranging from 0 (never) to 6 (always): 0 (never), 1 (once a year or less), 2 (once a month or less), 3 (a few times a month), 4 (once a week), 5 (a few times a week), and 6 (every day).

The MBI-SS is an instrument used solely to evaluate Burnout Syndrome, without considering the reasons that caused it. The instrument evaluates the score according to the three dimensions, with high levels in exhaustion, detachment from work and professional inefficacy being indicators of a high level of Burnout.

Individuals who have Burnout have their scores high for exhaustion (score greater than 14) and cynicism (score greater than 6) and low for professional efficacy (score less than 23) (22). These scores corresponded to the 66th percentile for exhaustion and cynicism and the 33rd percentile for efficacy. Low and concurrent scores corresponded to exhaustion (score less than 10), cynicism (score less than 2), and efficacy (score greater than 27).

Therefore, the scale is inverted when we refer to this last dimension (professional efficacy). The lower the score, the lower the professional effectiveness and the greater the chance of characterizing Burnout Syndrome if the scores of the other two dimensions are high. Average Burnout levels are in between these scores (22). Thus, Burnout was considered to be at a low level based on the following scores: emotional exhaustion (0-9), cynicism (0-1), and professional efficacy ( $> 27$ ). Burnout was identified at a moderate level based on the following scores: emotional exhaustion (10-14), cynicism (26), and professional efficacy (23-27). Finally, Burnout was identified at a high level based on the following scores: emotional exhaustion ( $> 14$ ), cynicism ( $> 6$ ), and professional efficacy ( $< 23$ ).

To better understand the characteristics of the research participants, a sociodemographic questionnaire was given to characterize the sample with questions about: age, gender, number of children, exclusive dedication to the course, number of courses being taken, doing curricular internships, living in the city where the university is, living with the family, being supported by family members, use of alcohol and tobacco.

The MBI-SS and the sociodemographic questionnaire were applied in the first week of October 2019, in two days. The questionnaires were delivered to the students who agreed to participate in the research by the researchers themselves, along with the Informed Consent Form (ICF). The students who chose to participate in the research were taken to a room exclusively for filling out the questions of the evaluation instrument and the sociodemographic questionnaire. Those students who were absent on the days of the event, failed to fill out the instrument correctly, or decided not to participate in the research were excluded from the sample.

The completed questionnaires were manually transposed to a statistical program, where they were subjected to an exploratory data analysis, in order to verify the quality of the typing. The data were analyzed by descriptive statistics and by parametric and non-parametric tests.

## Results

The study included 94 medical students from the 1st to the 4th year. Of this sample, 23.4% (n = 22) of the students fit the three-dimensional diagnostic criteria for Burnout Syndrome. Among the 94 study participants, 45% (n = 42) were female and 55% (n = 52) were male. There were more female participants who met the criteria for diagnosis of Burnout Syndrome, with 31% (n = 13) of the total versus 17% (n = 9) of the male participants. Among the 22 students who met the Burnout criteria, therefore, 40.1% (n = 9) were male and 59.1% (n = 13) were female.

Regarding the year of graduation, 22 students were first year (23%), 28 students were second year (30%), 29 students were third year (31%), and 15 students were fourth year (16%). The fourth year was the school period that presented the highest proportion of students who fit the Burnout criteria, with 40% (n = 6) of the total students, followed by the second year with 32% (n = 9), the third year with 17% (n = 9), and the first year with 9% (n = 2).

As for the residence of the research participants, 84% (n = 79) lived in the city where the course was held and 16% (n = 15) were residents of other locations. Proportionally, the group of participants who lived in other locations showed a higher Burnout, with 33% (n = 5) versus 22% (n = 17) of the participants who lived in the course city. Most participants, 88% (n = 83), did not live with relatives and presented a lower proportion of Burnout, 22% (n = 18), when compared with the students who lived with their relatives, 12% (n = 11), presenting a higher Burnout, with a proportion of 36% (n = 4).

As for funding, 93% (n = 87) of the participants were funded by their families versus 7% (n = 7) who responded that they were not funded by their families. None of the students who were not funded by their families showed Burnout. However, 25% (n = 22) of the participants who were funded by their families showed Burnout.

Regarding the participants who used alcohol, 40% (n = 38) said "no" and 60% (n = 56) said "yes". For those who did use alcohol, 23% (n = 13) were within the Burnout parameters. Among those who did not use alcohol, 24% (n = 9) fell within the Burnout parameters.

Among participants who used tobacco, 7% (n = 7) answered "yes" and 93% (n = 87) answered "no." For those who did use tobacco, 29% (n = 2) fell within the Burnout parameters. Among those who did not use tobacco, 23% (n = 20) were within the Burnout parameters.

All descriptive information associating the sociodemographic questionnaire and the Burnout indices are present in Table 1:

**Table 1** – Detailing the prevalence of Burnout in students

Variables			Burnout	
	n	%	n	%
Gender				
Male	42	45%	9	21%
Female	52	55%	13	25%
Year of graduation				
1°	22	23%	2	9%
2°	28	30%	9	32%
3°	29	31%	5	17%
4°	15	16%	6	40%
Live in the city where goes to college				
No	15	16%	5	33%
Yes	79	84%	17	22%
Live with family				
No	83	88%	18	22%
Yes	11	12%	4	36%
It is funded by the family				
No	7	7%	0	0%
Yes	87	93%	22	25%
Drink alcohol				
No	38	40%	9	24%
Yes	56	60%	13	23%
Make use of tobacco				
No	87	93%	20	23%
Yes	7	7%	2	29%

Source: Prepared by the authors

Analyzing the Burnout sub-scales, it is notable a concentration of high scores in emotional exhaustion (57%) and cynicism (66%). However, job satisfaction has a balance between high (37%) and moderate (37%), with low satisfaction being the lowest (26%). Table 2 shows the detailed information for each Burnout sub-scale.

**Table 2** – Prevalence of Burnout sub-scales

Burnout Scales	n = 94	%
Emotional Exhaustion		
Low (0 – 9)	13	14%
Moderate (10 – 14)	27	29%
High (> 14)	54	57%
Cynicism		
Low (0 – 1)	5	5%
Moderate (2 – 6)	27	29%
High (> 6)	62	66%
Professional Satisfaction		
High (> 27)	24	26%
Moderate (23 – 27)	35	37%
Low (< 23)	35	37%

Source: Prepared by the authors

*Logit* is a qualitative binary response choice model, also known as a probability model. For the study in question, the dependent variable is dichotomous, meaning that the probabilities are restricted to the interval [0, 1]. The *Logit* model is named after the fact that it generates qualitative procedural responses of the presence or absence of a given attribute. Specifically, the idea is to check the probability that something will happen.

The *Logit* model is so called because it uses the cumulative logistic probability function, which is specified below:

$$Prob(y_i = 1) = \frac{e^{\beta' X_i}}{1 + e^{\beta' X_i}} = \frac{1}{1 + e^{-\beta' X_i}} = F(\beta' X_i)$$

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Where  $Y_i$  represents the dummy variable,  $X_i$  the vector of explanatory variables and the  $\beta$  the vector of model parameters.

Thus, based on the model approach, we proceeded to analyze the data collected. Table 3 shows the marginal effects of the results obtained by applying the *Logit* model. It is mentioned that, in this analysis, the *Logit* model presents a better fit compared to the Probit model when the robustness tests of the model are applied.

In the table in question, one can observe the value of the Count R2, which is a measure to analyze the quality of fit of the model, the same that predicts the correctly classified values.

Thus, observing Table 3, the model seems to have a good fit, between 64% and 67%, considering the sample size. The Count R2 is the ratio between the number of correct predictions and the number of observations of the model: the higher the result, the higher its degree of adjustment.

In the case of the first model, "high exhaustion", the semester variable indicates that exhaustion increases as the student advances through the school year.

In the second model, when analyzing cynicism, there is a similar effect of the variable "year" positively causing the level of cynicism. To wit, as students advance through the year, cynicism increases, consequently, the future health professional becomes sensitive to developing the Syndrome. In turn, as age increases, the degree of cynicism decreases; this behavior may be related to the ability of older and more experienced people to cope with the pressures that work and/or study demand.

In the third model, when the level of satisfaction is analyzed, it can be seen that satisfaction drops as the years of study increase, that is, the high satisfaction is evident in students who study in the early years. This behavior may reflect the responsibility that the future health professional sees in being involved in the academic environment as the years of study go by. In turn, low satisfaction is also corroborated in students who consume alcohol, i.e., the probability of finding a student with low satisfaction increases by 0.063% as he or she consumes alcohol.

**Table 3 – Marginal effect of the estimated Logit model**

Variables	Model 1 High Exhaustion	Model 2 High Cynicism	Model 3 Low Satisfaction
Term	0,035 (0,028)	0,008 (0,027)	0,026 (0,025)
Age	- . -	-0,018* (0,011)	- . -
Alcohol	- . -	- . -	0,063 (0,098)
Observations	94	94	94
Count R <sup>2</sup>	0,670	0,638	0,675
Prediction	67,02%	63,83%	67,02%

Source: Prepared by the authors

- a) \* Significant at 10%;
- b) b) Standard errors in parentheses.



## Discussion

When comparing the study conducted in São Paulo with the research found by Nassar, Andrade, and Arévalo (2018) for other states, it is possible to find similarities. In addition, the study by Costa *et al.* (2012), Pagnin *et al.* (2013) and Pagnin *et al.* (2014) used the MBI-SS instrument and had high scores for Emotional Exhaustion and Cynicism. The Job Satisfaction sub-scale was the only one to show different results.

If in the average of the scores the present study obtained results with moderate Job Satisfaction, as well as in studies in the state of Rio de Janeiro, in the absolute quantity there is a tie of 35 students with moderate and low scores. The studies carried out by Pagnin *et al.* (2013), Pagnin *et al.* (2014) and Pagnin and De Queiroz (2015) presented the results by the mean scores of the Likert scale, with the need to calculate the scores for each Burnout sub-scale, as shown in Table 4. In comparison, the present study obtained a mean of 15.4 for Emotional Exhaustion, 8.31 for Cynicism and 23.89 for Job Satisfaction.

**Table 4 – Comparative Results**

Authorss	Emotional Exhaustion	Cynicism	Professional Satisfaction
<b>Pagnin <i>et al.</i> (2013)</b>	19,75	7,72	25,32
<b>Pagnin <i>et al.</i> (2014)</b>	20,75	9,16	23,7
<b>Pagnin e De Queiroz (2015)</b>	21,2	8,84	23,88

Source: Prepared by the authors

When comparing the results for Emotional Exhaustion, the difference for the studies conducted in Rio de Janeiro is notable. For Cynicism and Job Satisfaction, the study results were in the averages of the Rio de Janeiro surveys.

The results of the study by Costa *et al.*, conducted in Sergipe, indicated that 60.2% of the students were in low Job Satisfaction (COSTA *et al.*, 2012). The results also indicated high Emotional Exhaustion. However, the relative amount of Burnout in the study by Costa *et al.* (2012) was lower than that presented in the present work. The work of Almeida *et al.* (2016), conducted in Ceará, also showed a lower relative amount of Burnout than the present study. The amount of students with Burnout Syndrome at the university in São Paulo studied was 23.4%, higher than the 14.9% in the work of Almeida *et al.* and than the 10.3% of Costa *et al.* (2012).

For the results of Almeida *et al.* (2016), the sample was grouped into their respective graduation years (first and second semester were considered as first year of graduation, for example). According to the authors, the study showed higher Burnout only in the first undergraduate year, with 18.2% of first-semester students and 14% of second-semester students being affected by Burnout. Regarding the other semesters, the results were as follows: 24.1% for the third semester, 12.8% for the fourth semester, 13.6% for the fifth semester, 10.6% for the sixth semester, 12.1% for the seventh semester and 17.9% for the eighth semester.

It is noteworthy that the results in gender discrimination followed the literature and the other comparative studies, with the exception of Costa *et al.* (2012). According to the authors, the result of their study is anomalous because the prevalence of Burnout is higher among females (COSTA *et al.*, 2012).

The study by Paro *et al.* (2014), conducted in 14 Brazilian states, with a sample size of over 1,600 individuals, divided the students by gender and in two-year intervals according to the year of graduation. As a result, the researchers did not identify high scores in the three characteristic dimensions of Burnout Syndrome in the division by graduation years. Similarly to the overall average, the results of male students continued to show the absence of Burnout Syndrome in the average results. The same pattern of behavior of the results is repeated among the female students, with high mean scores only for Emotional Exhaustion.

Since it has a multicenter sample, it is impossible to present a possible justification for the results related to the pedagogical characteristics of the colleges analyzed in the study by Paro *et al.* (2014), such as method and teaching plan.

A contribution of the study for future research developments is whether the teaching methodology applied to the course has a relationship with the mitigation of mental illnesses, such as Burnout Syndrome. The questionnaires used by the study did not include questions about the teaching structure of the course. Therefore, an opportunity opens up for research to further evaluate such a practical relationship, as the existing literature suggests the positive correlation.

Active learning results in better knowledge retention and creates a deeper understanding of the material than passive learning can achieve by shifting the focus to student needs and requiring active student participation (WOLFF *et al.*, 2015). The past few decades of problem-based and team-based learning in medical schools have generated strong evidence in support of using these techniques for evidence-based medicine understanding, communication skills, and self-directed learning (KOH *et al.*, 2008). When comparing the results for Emotional

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The curriculum of the medical course studied is based on competence orientation, theoretical-practical integration, and a constructivist educational approach, using active teaching-learning methodologies in groups. The course seeks to bring the student closer to the real professional practice since the first year, inserting him/her in teaching-learning scenarios that allow diversification, such as home care, outpatient care, pre-hospital care, hospital care, and urgent-emergency services. Because the course proposes theoretical-practical integration,

bringing the student closer to professional practice since the beginning of the undergraduate course, it is hypothesized, to be verified in further research, that such an approach has a positive impact on the results referring to job satisfaction.

These relationships present in the university's pedagogical model can mitigate mental attrition and the emergence of illnesses such as Burnout (NASSAR *et al.*, 2018). DeCaporale-Ryan *et al.* described a group experience with good results to combat the mental attrition that healthcare professionals were experiencing because of the pressure caused by the Covid-19 pandemic. Conducting small focus groups had a positive impact on the mental health of participants in Wen *et al.*'s study as it provided reflective practice and cooperative learning (WEN *et al.*, 2013).

### **Final remarks**

The students from the university studied showed a greater propensity to develop Burnout Syndrome, with a greater possibility of occurrence due to internships, family components and consumption of alcoholic beverages or cigarettes. As a suggestion, follow-up studies in other institutions can be carried out in order to verify this behavior and confirm the research findings.

It is noteworthy that, based on the literature, the pedagogical methodology proposed by the university may have contributed to the positive results in some symptoms that characterize Burnout. The literature indicates that the active teaching methodology brings the student into contact with practical characteristics of the profession right from the first years of graduation. The formation of study groups, a proposal of such methodology, can guarantee the psychological support necessary for the mitigation of mental exhaustion. These hypotheses are elements to be analyzed in future studies, but they have a literary basis.

In situations such as those verified in this study, it is suggested that medical schools pay attention to the promotion of students' well-being, especially in the first years of graduation. Actions aimed at prevention and detection of Burnout by the course coordinators are of utmost importance, because reducing the impacts of the syndrome will help in the better performance of the future medical professional. In this context, health promotion actions and positive behavior patterns among colleagues and professors are fundamental.

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