

Original papers

Occupational Stress and Burnout Syndrome in a Group of Resident Physicians	Radu Marek Colonescu ¹ , Florina Georgeta Popescu ^{1,2}
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Abstract

Introduction: The burnout syndrome is a state of physical, psychological and emotional exhaustion resulting from the accumulation of chronic work-related stress that has not been successfully managed. Healthcare professionals are among the groups most susceptible to developing this condition.

Materials and Methods: An anonymous questionnaire was administered to medical residents in Romania. It included items assessing sources of stress encountered in medical practice, the Perceived Stress Scale (PSS-14), the Copenhagen Burnout Inventory (CBI) as well as lifestyle-related questions.

Results: The study sample consisted of 84 medical residents from 29 different specializations. The mean PSS-14 score was 28.56 ± 9.63 , with 51% of participants presenting high or very high levels of perceived stress. Overall, 43% exhibited medium or high levels of burnout (total score), and the CBI subscales indicated a significant risk of personal burnout in 65%, work-related burnout in 52% and patient-related burnout in 35% of respondents. The most frequently identified stressors were: (1) excessive time required for completing medical documentation; (2) the inability to provide optimal patient care due to various limitations; and (3) frequent interruptions of work tasks.

Conclusions: Given that nearly half of the responding residents exhibit high or severe stress and burnout scores, this stage of medical training can be considered highly demanding. Stressors need to be clearly identified in order to implement organizational changes aimed at mitigating their impact.

Keywords: resident physicians, work-related stressors, perceived stress, burnout, occupational health

Introduction

One of the central concerns in occupational medicine is the supervision of the relationship between the workplace conditions and the employee's health, ensuring that the professional activity does not have harmful effects on the worker's health. Among the factors that make up the working condition, the category of psychosocial factors stand out, as they exert a substantial influence on employees' psychological and emotional health [1].

Work-related distress represents a major concern affecting both the health and the overall wellbeing of the employees. From a psychological perspective, it is described as a negative emotional state characterized by pressure or tension. Occupational distress is related to excessive job demands. In the United States, 83% of workers report being affected daily by work-related stress and perceive the demands of their professional duties as distressing [2]. The medical field is among the most impacted sectors, with the prevalence of chronic occupational stress ranging from 27%

to 87.4% across various studies [3]. The economic consequences are considerable: an estimated 120,000 deaths each year in the U.S. are caused by or associated with occupational stress [4]. Additionally, 5–8% of the total healthcare expenditures in the U.S. are attributed to work-related stress [4].

The burnout syndrome is a state of physical, psychological, and emotional exhaustion that results from chronic work-related stress that has not been successfully managed. The estimated prevalence of burnout in the medical field is high: 42.4% in France, 48.7% in Germany and 45.8% in the United States. A study including data from 12 European countries reported that 43% of physicians experience emotional exhaustion [5]. Overall, burnout levels are significantly higher among physicians compared with the general population: 48.8% versus 28.4% [6].

Both occupational distress and burnout syndrome have numerous negative consequences for employees and their professional activity. These include psycho-emotional problems (such as insomnia, depression and substance abuse), physical issues (including increased cardiovascular risk, metabolic disorders and symptoms associated with musculoskeletal disorders) as well as organizational consequences (absenteeism, presenteeism, workplace accidents, and decreased productivity) [7]. Therefore, identifying and addressing workplace stress factors is in the best interest of employees, employers and healthcare professionals.

In this context, the present study aimed to: (1) identify the stress factors in the medical field, (2) assess the level of stress in a group of resident physicians, (3) determine the level of burnout within the same group and (4) analyse lifestyle factors in this population. By gaining a better understanding of this phenomenon among young healthcare professionals we hope to contribute to the improvement of the medical organizational environment by reducing or eliminating identified stressors, ultimately decreasing distress and enhancing eustress and overall wellbeing.

Materials and Methods

A cross-sectional observational study was conducted between March and September 2024 using an online questionnaire created in Google Forms and distributed online.

The questionnaire contained 76 items, organized into four sections. The first section included 29 questions aimed at identifying the workplace stressors. To examine workplace characteristics that may influence the psycho-emotional wellbeing of the studied group,

certain items from the questionnaire “A shortened stress evaluation tool” (ASSET) [8] were selected and adapted to the medical environment. ASSET is a psychometric instrument comprising 100 items that, among other objectives, identifies sources of organizational stress and is widely used in workplace assessment and improvement programmes designed to enhance both performance and employee wellbeing [9]. In addition to the adapted ASSET items, several supplementary items were introduced to capture other potential stressors specific to medical practice. The last question in this section was open-ended, allowing participants to name additional stressors not previously included. In the end, the first section comprised 29 items.

The second section of the questionnaire included the 14-item Perceived Stress Scale (PSS-14), developed by Cohen and Williamson [10]. PSS-14 is one of the most widely used instruments for assessing perceived stress and is validated and freely available for academic purposes [11]. We selected this tool to determine stress levels within the study group. The scale consists of 14 direct questions assessing stress related to feelings, events, experiences and thoughts over the past month. The items are phrased generally - “In the last month, how often have you felt that...?” - which allows for broad applicability across different populations. Responses range from 0 to 4 points (0–never, 1–almost never, 2–sometimes, 3–fairly often, 4–very often), yielding a total score between 0 and 56.

Interpretation of the PSS-14 is as follows:

- 0 – 14 points: low stress level
- 15 – 28 points: moderate stress level
- 29 – 42 points: high stress level
- 43 – 54 points: very high stress level

To complete the assessment of the effects of occupational stressors on the study group, the third section of the questionnaire included the Copenhagen Burnout Inventory (CBI). Developed in 2005 by Tage S. Kristensen, Marianne Borritz, Ebbe Villadsen, and Karl B. Christensen, the CBI consists of 19 items and evaluates three dimensions/ subscales: (1) personal burnout, (2) work-related burnout and (3) client/ patient/ student-related burnout. Finally, the total burnout score is calculated. The CBI is freely accessible, validated and considered one of the most reliable instruments for assessing burnout [12].

The Copenhagen Burnout Inventory comprises 19 questions distributed across three subscales:

- Personal burnout (6 items)
- Work-related burnout (7 items)
- Client/ patient/ student-related burnout (6 items)

There are five response options: always (100), often

(75), sometimes (50), seldom (25), and never/ almost never (0). The score for each subscale is obtained by calculating the mean of its item scores. The total burnout score is calculated by averaging the scores.

Interpretation of the Copenhagen Burnout Inventory scores:

- 0 – 50: low level of burnout
- 50 – 74: moderate level of burnout
- 75 – 99: high level of burnout
- 100: severe burnout

A score above 50 represents the cut-off for classifying a respondent as at risk of burnout, with those who obtained a moderate, high or severe score being classified as such.

One of the reasons for choosing this questionnaire is the presence of a subscale specifically assessing patient-related burnout - highly relevant in the medical context - since caring for a suffering person represents an important potential source of stress and burnout.

The fourth and final section of the questionnaire collected demographic and lifestyle-related data, summarized in 14 items. Demographic variables included age, gender, job position, years of work experience and medical specialization. Lifestyle-related questions addressed physical activity, diet,

consumption of coffee, alcohol, cigarettes and energy drinks, social life, time allocated to hobbies and sleep quality.

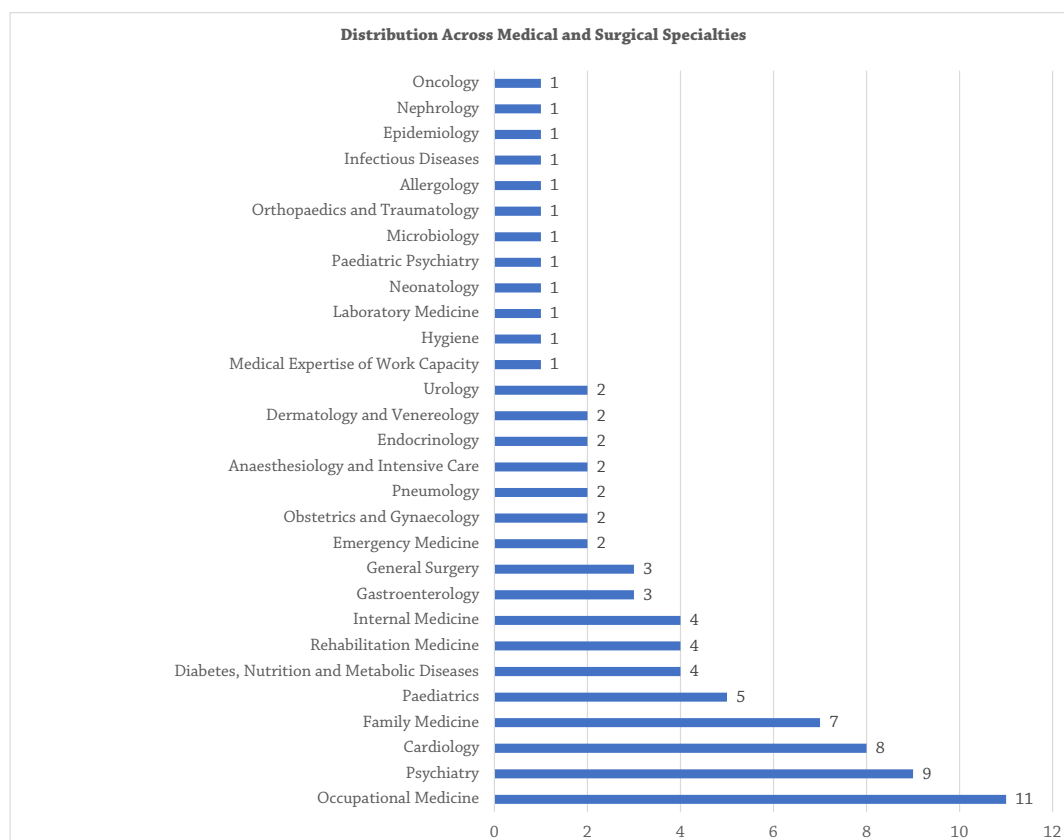
The study sample consisted of resident physicians working in various healthcare facilities across Romania. The main inclusion criterion was active employment in the Romanian healthcare system at the time of the questionnaire completion, performing activities corresponding to residency training. Exclusion criteria included incomplete or invalid questionnaire responses or refusal to participate in the study. The questionnaire was distributed to 193 individuals of whom 89 responded. Five responses were excluded due to improper completion, resulting in a final number of accepted participants of 84 resident physicians.

Data processing and analysis were performed using Microsoft Excel, 2019 version.

Results

The 84 respondents represented a heterogeneous distribution of medical and surgical specializations, originating from 29 different specializations (Figure 1).

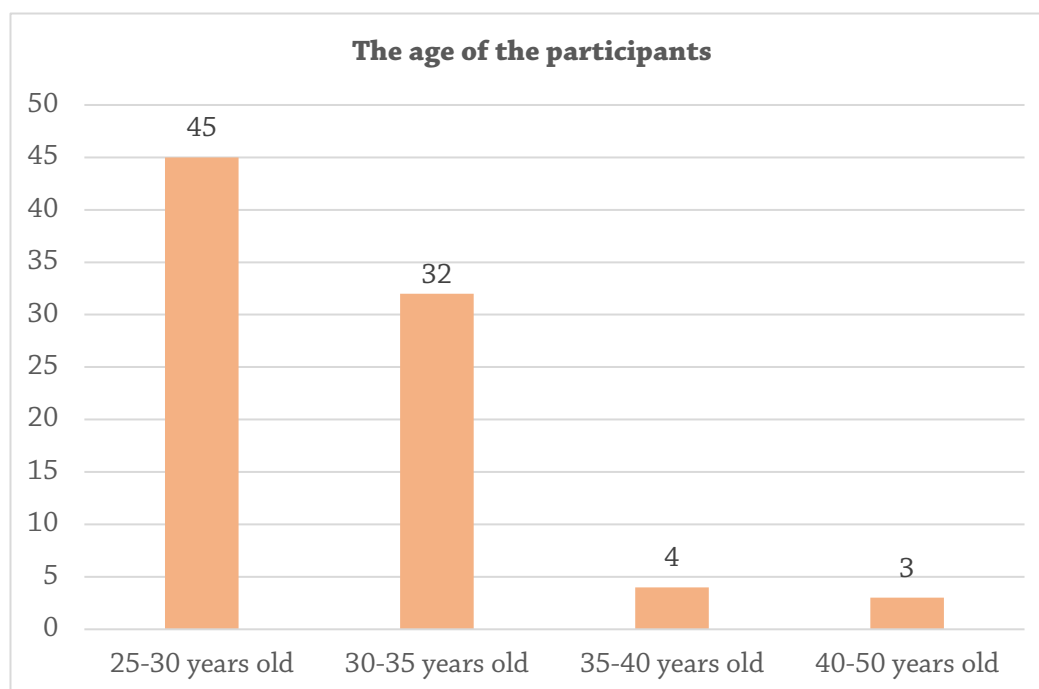
Figure 1. Distributions across medical and surgical specialties



61 of the participants were female and 23 were male. The mean age was 31.24 ± 9.34 years (minimum = 26, maximum = 47), with a median of 29 years and a mode average of 29 years (Figure 2). Regarding work

experience, the mean was 4.86 ± 3.57 years (minimum = 1 year, maximum = 22 years), with a median and mode of 4 years.

Figure 2. Distribution by age group



The first section of the questionnaire allowed respondents to evaluate various stress factors within the medical field. The items and collected responses are presented in the graph below (Figure 3). They were ordered according to the ratio between agreement (strongly + slightly) and disagreement (strongly + slightly).

The three main stress factors identified - each endorsed by more than 85% of the participants (strongly or slightly agreeing) - were:

1. The amount of time spent completing the documentation (observation sheets, consent forms, discharge summaries, etc.) is too high. (90% agreement)

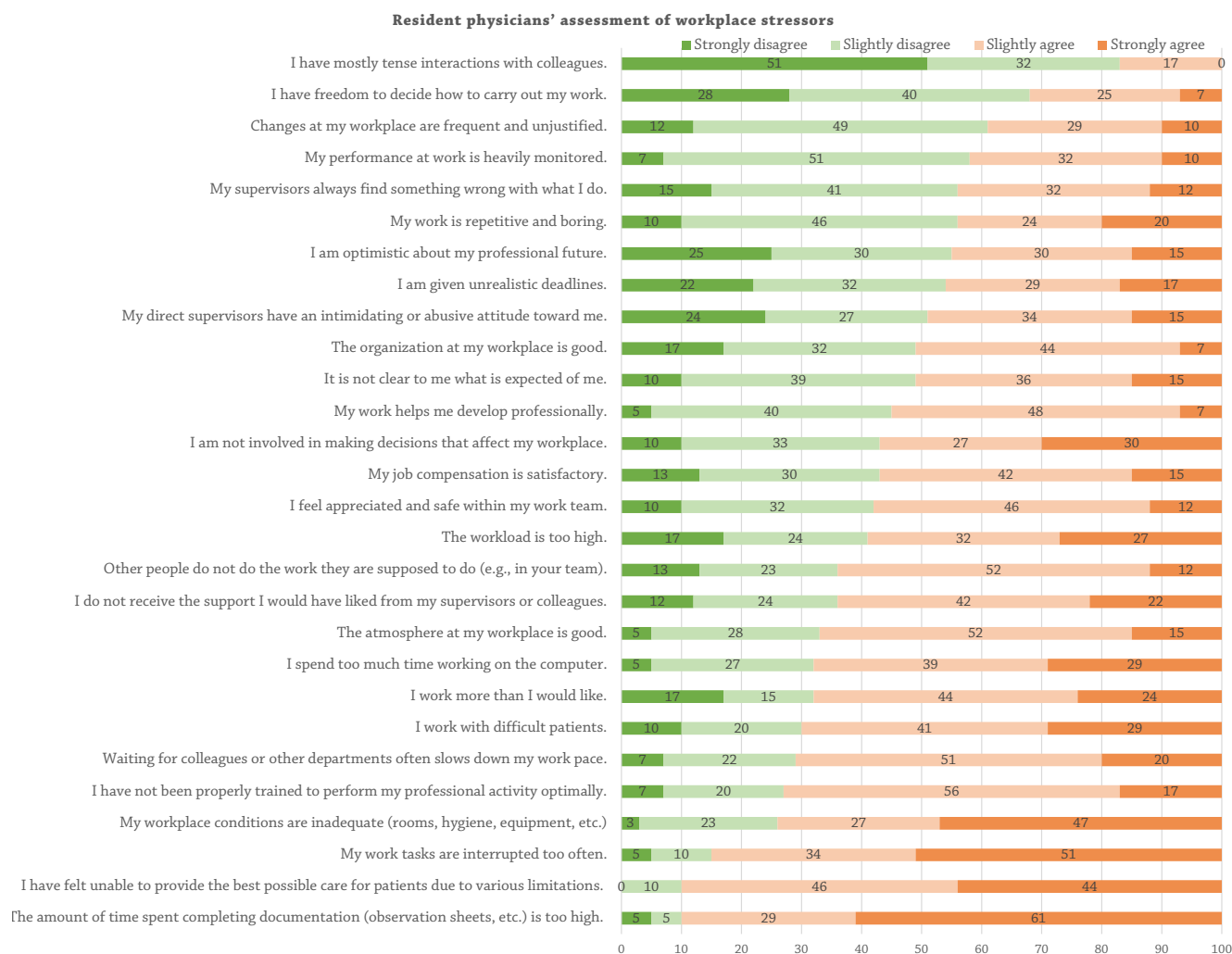
2. I have felt unable to provide the best possible care for patients due to various limitations (lack of equipment, medications, etc.). (90% agreement)

3. My work tasks are interrupted too often. (85% agreement)

Among the 28 statements, 7 were positively formulated. In interpreting these items, the severity of the stress factor is reflected by the proportion of disagreement. Of these, the statement that obtained the highest degree of disagreement (68%) was: "I have the freedom to decide how to carry out my work."

Question 29 ("Do you encounter any other difficulties at your workplace? If so, please specify which ones:") was an open-ended item. Only four participants provided answers, identifying the following issues:

1. excessive bureaucracy
2. lack of opportunities to develop practical skills
3. performing tasks not included in a medical resident's job description
4. unfriendly attitudes from colleagues.

Figure 3. Distribution by the working stress factors

Section 2 of the questionnaire applied the Perceived Stress Scale. The mean score obtained was 28.56 ± 9.63 , with a minimum score of 6, a maximum of 51, a median of 28, and a mode of 29. The distribution of stress levels among the resident physicians (Figure 4) included in the study was as follows:

- Low stress level: 4 participants
- Moderate stress level: 37 participants
- High stress level: 40 participants
- Very high stress level: 3 participants.

The overall mean burnout score, assessed using the Copenhagen Burnout Inventory, was 48.98 ± 21.84 , with a median of 44 and a mode of 35. Based on the established cut-off, 43% of participants have an increased risk of burnout. The distribution of total burnout levels was as follows:

- Low burnout: 48 participants

- Moderate burnout: 23 participants
- High burnout: 13 participants
- Severe burnout: 0 participants

For the personal burnout subscale, the mean score was 55.6 ± 23.15 , with 64% of respondents meeting criteria for personal burnout.

For the work-related burnout subscale, the mean score was 51.2 ± 22.54 , with 48% of respondents classified as experiencing work-related burnout.

For the patient-related burnout subscale, the mean score was 38.47 ± 25.65 , with only 33% of respondents meeting criteria for patient-related burnout.

The distribution of burnout levels across the four CBI domains—total, personal, work-related, and patient-related—is presented below (Figure 5) through a series of pie charts that summarize the proportions observed in the study sample.

Figure 4. Stress Distribution by perceived stress scale

Stress Level Distribution - Perceived Stress Scale (PSS-14)

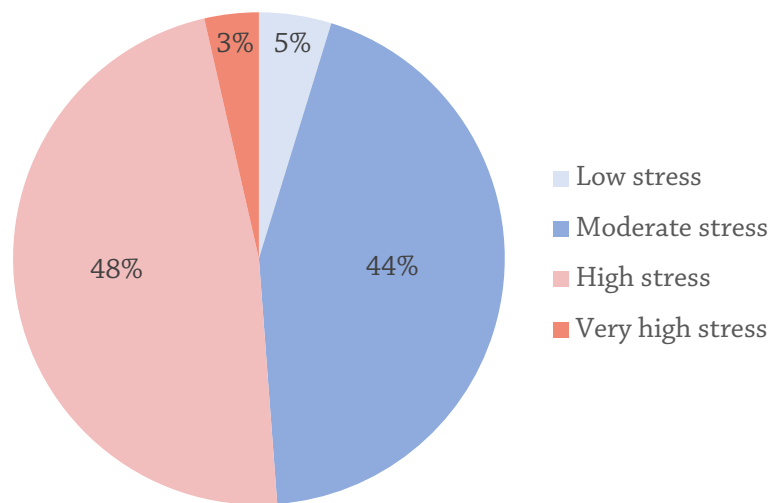
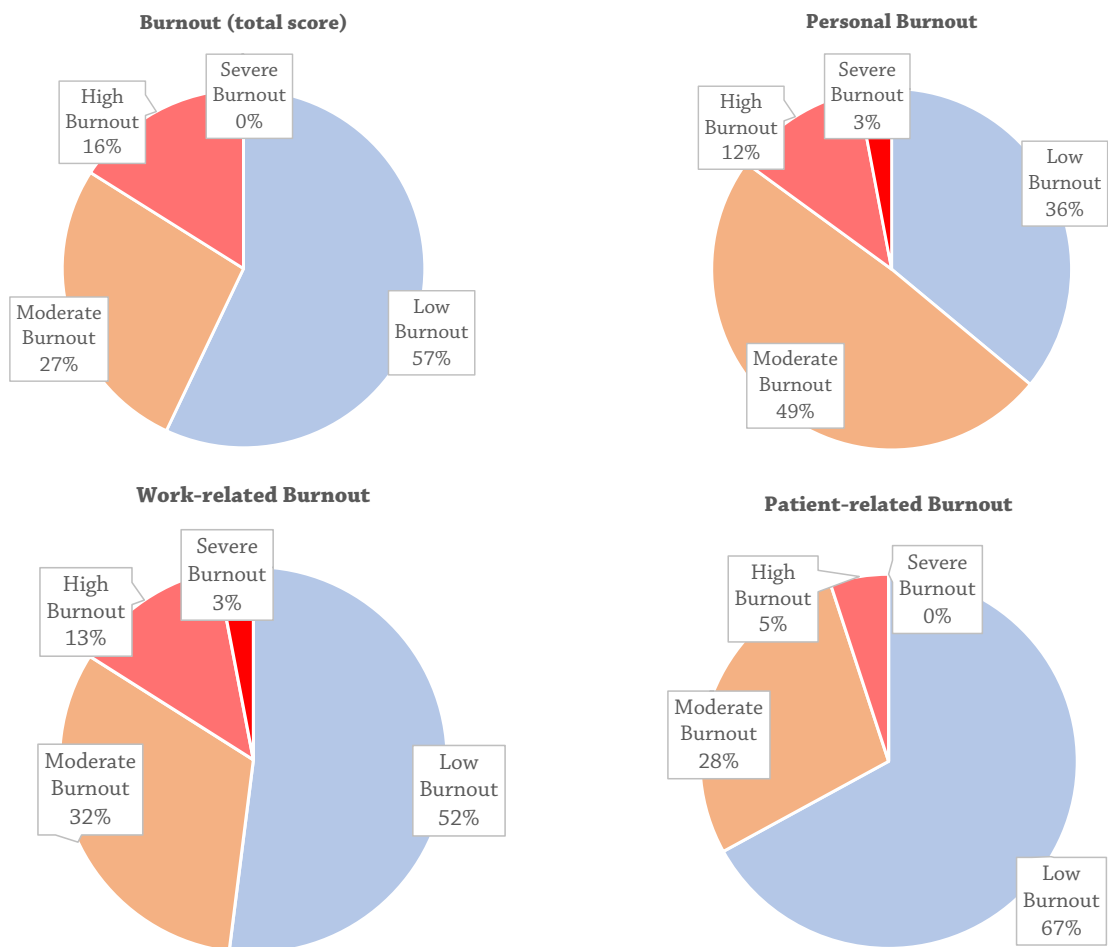


Figure 5. Distribution by the Copenhagen Burnout Inventory



The final section of the questionnaire included nine lifestyle-related questions. The responses received are summarized in the table below:

Table 1. Distribution by the lifestyle related questions

Question	Answer	Percentage
Do you have a healthy diet?	Yes, almost always	5%
	To a great extent	55%
	To a small extent	34%
	Not at all	6%
Do you exercise regularly?	Yes, 3–4 times per week	9%
	Yes, 1–2 times per week	31%
	No	60%
Do you consume coffee?	No	14%
	Yes, 1–2 cups/day	70%
	Yes, >2 cups/day	16%
Do you smoke cigarettes?	No	88%
	Yes, 1–10/day	7%
	Yes, 11–20/day	5%
	Yes, >1 pack/day	0%
Do you consume alcohol?	No	61%
	Yes, 1–2 drinks/week	39%
	Almost daily	0%
Do you consume other energy drinks?	No	86%
	Yes, <500 ml/day	15%
	Yes, >500 ml/day	0%
Do you have an active social life? (meetings, going out etc.)	Yes, almost always	17%
	To a great extent	39%
	To a small extent	42%
	Not at all	2%
Do you have time for relaxing activities (hobbies)?	Yes, almost always	23%
	To a great extent	27%
	To a small extent	48%
	Not at all	2%
Do you get restful sleep?	Yes, almost always	18%
	To a great extent	48%
	To a small extent	31%
	Not at all	3%

A strong and statistically significantly positive correlation was observed between perceived stress, as measured by the PSS-14, and the overall burnout, assessed with the CBI total score ($r = 0.669$, $p < 0.001$), indicating that higher levels of perceived stress were associated with higher levels of burnout.

Perceived stress (PSS-14) showed significant positive correlations with all the dimensions of burnout. The association was strongest for personal burnout ($r = 0.716$, $p < 0.001$), followed closely by work-related burnout ($r = 0.670$, $p < 0.001$), both indicating strong and highly statistically significant correlations. Client-related burnout also showed a positive relationship ($r = 0.475$, $p = 0.002$), representing a moderate yet statistically significant correlation.

Discussions

To maintain and promote the mental health of workers, identifying and addressing occupational stress factors is essential. For this purpose, instruments such as the ASSET questionnaire and other similar psychometric tools have been developed. However, stress is a complex phenomenon that does not involve only negative effects. Hans Selye defined stress as a nonspecific response of the organism to an external demand, or as the general adaptation syndrome of an individual to environmental challenges. Factors that disrupt the physical or psychological homeostasis of the organism are considered stressors [13]. Psychological stress is the organism's response to psycho-emotional demands. These demands can have beneficial effects, the so-called eustress, which stimulate, motivate and support individual development. Conversely, when external demands exceed the individual's adaptive capacities both quantitatively and qualitatively, distress - the harmful stress - occurs [14]. If distress becomes chronic, it may eventually lead to the burnout syndrome. This study aimed to analyze sources of stress in order to maintain professional demands within the range of eustress.

The first stress factor identified, reported by 90% of participants, was the time spent completing medical documentation (observation sheets, consent forms, discharge summaries etc.). This aspect should be investigated further to establish the proportion of time dedicated to patient care versus the time spent for bureaucratic tasks. A study conducted in the United States involving 57 physicians from four different specializations found that for every hour spent with patients, physicians spent two hours completing

medical paperwork, meaning that two-thirds of their activity was devoted to bureaucracy [15].

Similarly, 90% of participants reported feeling unable to provide the best possible patient care because of various limitations (e.g. lack of equipment or medications), and 75% indicated that workplace conditions were inadequate (e.g. facilities, equipment, hygiene). These findings align with a 2013 study by the Romanian College of Physicians on burnout and the intention to emigrate, which surveyed 8,121 respondents and identified poor working conditions and inadequate healthcare infrastructure as the main reason for leaving the Romanian healthcare system [16].

A third issue identified, agreed upon by 85% of participants, was frequent interruptions during work tasks. Indeed, frequent interruptions are known to increase distress, fatigue, errors and burnout rates while reducing employee productivity [17].

Regarding the workload, it seems to be oversized, with respondents stating that they work more than they want to (68%), the workload is too high (59%) and that there is too much computer work (68%).

Regarding interpersonal relationships, respondents' perceptions were largely positive: 67% reported that the workplace atmosphere is good, while only 17% indicated that their interactions with colleagues are predominantly tense. Concerning the relationships with the supervisors, 49% of participants stated that their superiors exhibit intimidating or abusive behavior, and in 44% of cases supervisors consistently find faults in subordinates' work. Additionally, 64% reported not receiving the support they would like from colleagues or supervisors. Collaboration with colleagues is further hindered by others not fulfilling their responsibilities (67%) and by waiting consultations or investigations from other departments (71%), which slow down the efficiency of one's own work.

The professional training process also represents a source of stress. 73% of respondents said they had not been properly trained to carry out their professional activity, and 51% said it was not clear to them what is expected of them. Only 55% stated that their work contributes to their professional development. Regarding professional autonomy, only 32% reported having the freedom to decide how to carry out their activities.

Just over half (51%) considered their workplace organization to be good. However, 57% stated that they are not involved in workplace decision-making.

In terms of rewards and professional resources, 57% were satisfied with their remuneration, 58% felt

appreciated and safe within their work environment and only 45% expressed optimism about their professional future.

These sources of stress help explain the scores obtained using the Perceived Stress Scale (PSS-14). More than half of the participants (52%) had high or very high stress levels, with a mean score of 28.26 ± 9.63 . These stress levels are similar to those reported in other studies. Resident physicians in Australia and the United States had mean PSS-14 scores of 27.3 ± 7.6 and 26.7 ± 8.2 , respectively [18]. In Saudi Arabia, resident physicians had a mean PSS-14 score of 27.65 ± 9.39 [19].

This state of psychological tension often begins during the medical studies. In the United States, 82% of medical students experience at least one form of distress, and 58% report three or more forms of distress [20]. Application of the PSS-14 to medical students in Saudi Arabia yielded similar results: 59% of the students showed significant stress levels, with a mean score of 28.5 ± 3.8 [21].

Chronic occupational stress that is not successfully managed can lead to the burnout syndrome, which is characterized by three main features according to the ICD-11 definition of the World Health Organization [22]:

- A feeling of energy depletion or exhaustion,
- Increased mental distance from one's work or feelings of negativism or cynicism related to work,
- Reduced professional efficacy.

Following the application of the Copenhagen Burnout Inventory (CBI), the tool used in this study to assess burnout levels, the mean score was 48.98 ± 21.84 , with 43% of participants falling into the burnout risk category. This total score is derived from the average of the three subscales: personal burnout, work-related burnout, and patient-related burnout (in a medical context).

The Personal Burnout Scale is generic, addressing the question: "How tired or exhausted are you?" regardless of the source of fatigue (professional life, family life, health issues etc.) [23]. This approach acknowledges that chronic exhaustion may have sources beyond the workplace. In this study, 64% of respondents met the criteria for personal burnout.

The Work-Related Burnout Scale reflects the degree of fatigue and exhaustion that a person attributes to their work. Here, 48% of respondents fell into the work-related burnout category. By comparing this score with the personal burnout score, it is possible to assess the relative impact of the workplace versus non-work-related stress factors. The similarity of these scores suggests that the workplace is the main

source of burnout for 48% of participants, while extraprofessional causes play a significant role in 16% of respondents.

The Client-Related Burnout Scale measures the fatigue and exhaustion perceived as resulting from work with clients - adapted to the medical context as patients [23]. Only 33% of respondents met the criteria for patient-related burnout, lowering the total burnout score.

Similar results were reported in a 2017 study by the Bucharest College of Physicians using the same instrument, the Copenhagen Burnout Inventory. That study found that 55% of physicians in Bucharest had high personal burnout, 52% had high work-related burnout and 36% experienced high patient-related burnout [24], closely aligning with the findings of this study.

As with stress, elevated burnout risk levels appear to emerge during medical school. A meta-analysis reported that the prevalence of high burnout scores among medical students ranges from 27% to 75% [25]. This is significant, as it suggests that chronic exhaustion may begin prior to residency and intensify during postgraduate training.

Data regarding lifestyle factors indicate room for improvement, which could positively impact both physical and mental well-being. Notably, 60% of the respondents reported not engaging in regular physical activity. An active lifestyle has numerous benefits for mental health, including reduced stress and anxiety [26]. Accordingly, the WHO recommendation of at least 150 minutes of moderate-intensity physical activity per week is important to consider [27].

Regarding nutrition, 40% of the participants reported a diet that is minimally healthy or unhealthy. A balanced and nutritious diet positively influences psycho-emotional well-being, with a bidirectional relationship between the two aspects [28].

Coffee consumption remained within recommended limits, with 70% of participants consuming 1 - 2 cups per day. Consumption of alcohol, energy drinks, and cigarettes - which can represent unhealthy coping mechanisms in stressful situations - was fortunately very low in this group.

The results also show that 44% of respondents do not have an active social life (meetings with friends/family, outings etc.), and 50% have little or no time for relaxing activities or hobbies. As demonstrated by one of the longest-running studies in history, conducted under the auspices of the Harvard University, warm and close relationships are the most important factor for a healthy and happy life [29]. Regarding sleep, only approximately one-third of the participants reported

not having restful sleep.

The strong positive correlations observed between the perceived stress and the multiple dimensions of burnout highlight the substantial psychological burden experienced by medical residents. These findings are consistent with other studies, showing that elevated stress levels are closely linked to emotional exhaustion and diminished well-being among physicians in training [30]. The particularly strong associations with personal and work-related burnout suggest that general and occupational pressures represent major contributors to residents' psychological strain, a pattern also noted in similar cohorts across Europe [31]. The moderate correlation with client-related burnout aligns with prior research indicating that although interactions with patients can be emotionally demanding, organizational and workload stressors tend to exert a stronger influence on burnout trajectories [32]. Overall, these findings emphasize the need for targeted institutional strategies to mitigate stress and reduce burnout risk in residency training programs.

Limitations

This study has several limitations. First, the sample size was relatively small, comprising only 84 medical residents distributed across 29 specializations, which limited the ability to perform robust comparative or subgroup analyses. The uneven representation of specializations may also reduce the generalizability of the findings. Additionally, the cross-sectional design captures stress and burnout levels at a single point in time, preventing the assessment of causal relationships or temporal fluctuations. The use of self-reported questionnaires may introduce reporting bias and the voluntary nature of participation raises the possibility of selection bias, as individuals experiencing higher levels of stress or burnout may have been more inclined to respond. Finally, external factors not assessed in the questionnaire - such as institutional policies, workload variability or personal

coping mechanisms - could have influenced the results.

Conclusions

The professional environment in which medical residents carry out their activity contains modifiable sources of stress whose impact on physical and mental well-being can be alleviated. This study identified and evaluated many of these stressors. Among them, the time spent on administrative tasks stands out, suggesting a need for auditing data collection and processing workflows to increase efficiency, thereby allowing more time to be dedicated to patient care rather than to bureaucratic activities. The study demonstrates that perceived stress is strongly and significantly associated with burnout among Romanian medical residents, affecting all major dimensions of the syndrome. Additionally, investments in the healthcare infrastructure could contribute to reducing the level of distress.

Improving the quality of relationships between colleagues and mentors through more effective communication - grounded in respect and empathy - may also support comprehensive professional development, encompassing knowledge acquisition as well as the development of skills and competencies.

Lifestyle factors further influence how stressors impact overall well-being. Maintaining a healthy and balanced diet, engaging in regular physical activity, ensuring adequate and restorative sleep, sustaining an active social life and avoiding smoking or excessive caffeine and alcohol consumption can enhance mental resilience, enabling residents to respond more effectively to professional challenges.

By mitigating workplace stress factors and optimizing lifestyle habits, it is possible to reduce stress levels and burnout risk, allowing professional demands to remain within the realm of eustress - a form that motivates, stimulates, and supports the professional growth of medical residents.

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