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Burnout in Medical Residents: A Systematic Review of Literature

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Abstract

Background: Burnout is characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment. This study aims to review the current knowledge of professional burnout and its related factors among Iranian medical residents.

Materials and Methods: In this review, a systematic search of online databases (Medline, EMBASE, Scopus, Web of Science, ERIC, ProQuest, SID, CIVILICA, and Google Scholar search engine) was conducted for relevant studies with no time limit up to March 2024. Two reviewers evaluated the quality of eligible studies and carried out the selection procedure. The quality of the information was evaluated using the STROBE statement.

Results: In this comprehensive review of seven studies involving 1,000 medical residents, the overall burnout prevalence across all specialties was 82.1% (ranging from 67.4% to 96.9%), with 84.8% reporting high emotional exhaustion (EE), 96.9% demonstrating high depersonalization (DP), and 89.2% exhibiting low personal accomplishment (PA) scores. A significant relationship was found between burnout and multiple factors including age, gender, year of residency, marital status, academic rank, parental status, monthly on-call frequency, work sector, clinical learning environment, and leisure time ($p<0.05$). Notably, depersonalization scores were significantly higher among internal medicine residents compared to surgical residents ($p=0.04$), and EE was more pronounced in single and first-year residents than in married and more advanced-grade residents ($p<0.05$), highlighting the complex and multifaceted nature of professional burnout in medical training.

Conclusion: Based on the results, the prevalence of burnout among medical residents was significantly higher than anticipated and alarmingly concerning. Given the critical implications of burnout, early recognition and proactive prevention strategies can be instrumental in safeguarding residents' mental health, enhancing their professional performance, and ultimately improving their overall quality of life and patient care.

Key Words: Burnout, Iran, Medical residents, Prevalence.

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1- INTRODUCTION

Maslach and Jackson (1981) defined burnout as a psychological response to work with three dimensions: emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA). Emotional exhaustion indicates long-term emotional fatigue due to challenging work activities. Its main causes include high workload, inconsistent working conditions, and organizational challenges. EE is the first stage of burnout syndrome, when a person feels exhausted and demoralized and struggles to maintain professional performance. Depersonalization occurs when a person develops a negative and detached attitude towards colleagues and clients, disregarding their needs and emotions, representing a critical stage of burnout. Reduced personal accomplishment is the perception of professional inadequacy, where one evaluates oneself negatively and experiences feelings of incompetence, which can result from EE, DP, or both (1-3).

This syndrome occurs in response to prolonged occupational stress and is more prevalent among professionals in direct interpersonal service roles (4, 5). The medical profession, characterized by intense patient-doctor interactions, is considered one of the most stressful occupations (6), potentially leading to professional burnout. This can result in:

- Development of various physical and mental health complications
- Negative professional attitudes
- Compromised patient communication (7).

In our context, medical residents are critical members of the healthcare community, playing a fundamental role in disease diagnosis and treatment (3, 8). The medical residency period represents one of the most demanding phases in a physician's professional development, requiring substantial mental and physical resilience (9). COVID-19, characterized by its high infectivity, rapid transmission, and variable mortality across different societal groups (10-15), has significantly compromised the mental health of medical personnel (16, 17). During the pandemic, healthcare workers were compelled to adapt to:

- Increased professional responsibilities
- Excessive workloads
- Chronic sleep deprivation
- Substantial physical exhaustion (18, 19).

Extensive research demonstrates that burnout represents a critical and potentially dangerous factor threatening medical professionals' health. Despite continuous efforts to improve working conditions, physicians experiencing prolonged patient care continue to suffer from this professional syndrome (20-25).

A meta-analysis from 2019 revealed that burnout prevalence among medical residents was 51%, with higher rates observed in specialties such as neurology, radiology, and general surgery (26). A study of 165 Iranian emergency medicine specialists demonstrated that most experienced moderate to high levels of job burnout (27). Recent research consistently highlights the significant burnout challenge among medical residents during postgraduate training. Multiple studies have confirmed severe burnout experiences during postgraduate medical training (28, 29). Castelo-Branco et al. found that over 58% of residents exhibited burnout symptoms (30), while Sepehrmanesh and Ahmadvand reported an alarming 96% burnout rate (7). Contemporary medical research now recognizes professional burnout as a critical issue due to its profound and destructive impacts on individual quality of life and professional performance (31).

Following the COVID-19 pandemic, the World Health Organization (WHO) recognized the urgent need to address mental health challenges in healthcare communities, particularly among medical residents (32-34). Stress is inherently common during medical residency (35), with burnout often resulting from prolonged occupational and personal pressures (36-40). Medical residents, positioned at the forefront of disease treatment, experienced intensified stress during the pandemic (41, 42), facing unprecedented psychological challenges. In our country, residents typically endure more working hours, less personal time, and lower incomes compared to international counterparts (43, 44), further increasing their vulnerability to psychological disorders.

The limited scientific literature regarding burnout syndrome among Iranian residents highlights a critical research gap. The essential role of medical residents in the healthcare system and their significant impact on patient and societal health necessitates comprehensive understanding of psychological disorders and their underlying causes. By identifying prevalent psychological challenges, researchers can develop targeted interventions and psychological solutions to improve residents' mental well-being. The present study aimed to systematically summarize published research on professional burnout and related factors among diverse Iranian medical residents, providing crucial insights into this complex and critical healthcare workforce issue.

2- MATERIALS AND METHODS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used as a methodological template for conducting this systematic review (45).

2-1. Eligibility criteria

The Population, Intervention, Comparison, and Outcome (PICO) framework was utilized to define the review's research objective and establish systematic inclusion criteria.

- **Participants:** Iranian medical residents.
- **Interventions:** The 22-item Maslach Burnout Inventory (MBI) was employed as the standardized measurement instrument (46).
- **Comparators:** Medical residents were compared across different specialties and demographic characteristics.
- **Outcomes**: Prevalence and severity of burnout syndrome.

2-2. Included studies

Only peer-reviewed articles were selected for this systematic review, with inclusion criteria focusing on quantitative assessments of professional burnout among Iranian medical residents. Studies were required to be published up to March 2024, written in English or Persian, exclusively utilizing the Maslach Burnout Inventory for diagnosis (46), with full-text availability and demonstrating high methodological quality according to the STROBE tool (47).

2-3. Exclusion criteria

The exclusion criteria encompassed abstracts without full-text articles, studies involving medical students or hospital medical provider populations, diagnostic instruments other than the Maslach Burnout Inventory, articles not written in English or Persian, review articles and meta-analyses, longitudinal studies, letters to the editor, editorials, research protocols, short reports, case reports, and brief communications.

2-4. Information sources

A systematic search of electronic databases (Medline (via PubMed), EMBASE, Scopus, Web of Science, ERIC,

ProQuest, SID, CIVILICA, and Google Scholar search engine) was conducted. The search was performed independently and in duplicate by two reviewers, with any disagreements resolved by the supervisor.

2-5. Search strategy

Search terms were a combination of (burnout OR burnout syndrome OR professional burnout OR job burnout) AND (medical resident OR resident OR residency training OR residency OR internship and residency) AND (Iran).

2-6. Study selection

A database search was performed to identify potential studies. Study abstracts were screened for eligible studies, full-text articles were obtained and assessed, and a final list of included studies was compiled. This process was conducted independently and in duplicate by two reviewers, with any disagreements resolved by a third reviewer. References were organized and managed using EndNote software (version X8). The following data were extracted independently for each included article: first author, year, study population, sample size, area/city, overall burnout, and main findings (**Table 1**).

2-7. Data collection process

A researcher's data collection form was developed and used for each study. Two reviewers collected the data independently. The collected data were combined and compared for accuracy, and a third reviewer resolved any discrepancies.

2-8. Risk of bias in individual studies

The risk of bias was assessed using the STROBE (STrengthening the Reporting of Observational Studies in Epidemiology) checklist guidelines. It is a valuable tool for evaluating the quality of observational studies. This checklist contains 22 items, scored based on the importance of each item for the present study. The final score of the checklist was 30, with a minimum score of 15.0 (47). The assessment was performed by two reviewers independently and in duplicate, with any discrepancies resolved by a third reviewer.

3- RESULTS

A total of seven articles (n=1,000 medical residents) met the inclusion criteria for this systematic review (**Figure 1**). All included studies were of acceptable quality based on the STROBE checklist (47). The overall burnout prevalence for all specialties was 82.1% (ranging from 67.4% to 96.9%). The prevalence of burnout during the COVID-19 pandemic (67.4%) was lower compared to previous years (96.9%). The main characteristics of the selected studies are summarized in **Table 1** and as follows:

1. A cross-sectional study aimed to investigate the correlation between spiritual intelligence and job burnout in medical residents of Mazandaran University of Medical Sciences during the COVID-19 pandemic in 2021-2022. The results showed that the mean burden of job burnout was 84.44 ± 21.51 (out of 114). The production of personal meaning had a significant correlation with job burnout, which was also observed in infectious residents. In emergency medicine residents, job burnout demonstrated a significant correlation with spiritual intelligence and the subscales of critical existential thinking, production of personal meaning, and transcendental consciousness (48).

2. A cross-sectional study aimed to evaluate the quality of the educational environment at Tehran University of Medical Sciences across different medical specialties and its correlation with residents' burnout in 2021. The results showed that burnout was reported by 67.4% of medical residents. Nearly two in three residents experienced burnout, which is relatively high compared with other studies. Perception of social support

significantly predicted burnout subscales ($p < 0.05$). The clinical learning environment, independent of personal characteristics, was associated with residents' burnout according to multivariate regression analysis [odds ratio = 0.567 (0.170–0.883), $p = 0.012$] (49).

3. A cross-sectional analytical study aimed to investigate the prevalence of burnout among orthopedic surgeons and residents in Tehran and Yazd cities in 2019. The results showed that out of 180 participants, 90 (50%) cases suffered from burnout, of whom 26.7%, 16.1%, and 7.2% received a pathological score in one, two, and three criteria, respectively. In terms of academic rank, 43 (23.9%), 94 (52.2%), and 43 (23.9%) cases were residents, general orthopedic specialists, and fellowship-trained orthopedic surgeons, respectively. There was a significant association between burnout and younger age, lower academic rank or being a resident, working in the public sector, and spending less time in leisure and sports activities. Additionally, the prevalence of burnout was higher among residents and those working in the public sector (50).

4. A cross-sectional study aimed to compare occupational burnout among professors and residents of emergency medicine in the educational and medical centers of Iran University of Medical Sciences in 2018. The results showed that the mean component of depersonalization of the professors and the residents was 54.05 ± 22.80 and 51.73 ± 24.73, respectively. The mean component of emotional exhaustion of professors and residents was 33.40 ± 14.77 and 32.84 ± 13.20, respectively, and the mean component of reduced personal accomplishment of professors and residents was 39.41 ± 10.23 and 9.56 ± 0.98, respectively. This indicates that the level of burnout among medical emergency professors and residents was high. There was a significant relationship between gender ($p = 0.02$), having a child ($p = 0.02$), and the number of on-calls per month ($p = 0.08$) with residents' burnout (51).

5. A cross-sectional study aimed to determine the prevalence of burnout among medical residents of Isfahan University of Medical Sciences in 2017. The results showed that 71.15% of residents suffered from burnout. The percentage of burnout among obstetrics and gynecology residents was higher than in the other two groups (non-significant), and was higher among the second and third-year residents ($p < 0.05$). Additionally, the percentage of burnout among married residents was higher than among single residents ($p < 0.05$) (52).

6. A cross-sectional study aimed to evaluate burnout in a tertiary hospital of Tehran University of Medical Sciences across different medical residents in 2017. The results showed that 188 residents (92.2%) experienced burnout. For emotional exhaustion (EE), 173 (84.8%) residents had a moderate or high score. For depersonalization (DP), 197 (96.6%) residents, and for personal accomplishment (PA), 182 residents (89.2%) had a high score. There was no significant difference between emotional exhaustion ($t = 0.07$, $p = 0.60$) and personal accomplishment ($t = -0.59$, $p = 0.15$) scores between the two genders, but depersonalization was significantly more prevalent in male residents (females: 21.9 ± 5.5, males: 20.6 ± 7.1; $t = 1.47$, $p = 0.04$). Regarding marital status, residency year, and different specialties, no significant differences between male and female participants were found (53).

7. A cross-sectional study aimed to evaluate burnout prevalence in medical residents of Kashan and Isfahan Universities of Medical Sciences in 2012. The results showed that the prevalence of burnout was 96.9%. Forty-two and a half percent of residents had mild burnout,

53.1% had moderate, and 1.3% had severe burnout. The prevalence of burnout was 98.9% in females and 94.5% in males. The mean burnout score was higher in single residents than in married ones and in first-year residents ($p < 0.05$). The frequency of depersonalization scores in internal medicine residents was higher than in surgical residents ($p < 0.05$). Emotional exhaustion was higher in single and first-year residents than in married and higher-grade residents ($p < 0.05$). This indicates that the majority of medical residents experienced burnout (7).

Table-1: General characteristics of the included studies (n=7).

First author, Reference	Study year	Area/ city	Study population	Sample size	Overall burnout	Main finding
Jamallivani, 48	2021	Three educational groups of Mazandaran University of Medical Sciences	Medical residents, including infectious diseases residents, internal medicine residents, and emergency medicine residents	36	The mean burden of job burnout was 84.44 ± 21.51 (out of 114).	The production of personal meaning had a significant correlation with job burnout, which was observed in infectious disease residents.
Maghbouli, 49	2021	The three largest teaching hospitals affiliated with Tehran University of Medical Sciences	Medical residents	221	Burnout was reported by 67.4% of medical residents.	A clinical learning environment, independent of personal characteristics, was associated with residents' burnout in Iran.
Ghoraishian, 50	2019	Tehran and Yazd	Orthopedic surgeons and residents	180	50% of participants were suffering from burnout.	The prevalence of burnout was higher among residents and those working in the public sector.
Monsef Kasmaei, 51	2018	Educational and medical centers of Iran University of Medical Sciences	Emergency medicine	95	The mean components of DP, EE, and PA among residents were 51.73 ± 24.73, 32.84 ± 13.20, and 9.56 ± 0.98, respectively.	There was a significant relationship between gender ($p = 0.02$), having a child ($p = 0.02$), and residents' burnout. The number of on-calls per month showed a marginally significant association ($p = 0.08$).
Dokht Kalani, 52	2017	Isfahan University of Medical Sciences	Emergency medicine, internal medicine, and obstetrics and gynecology residents	104	71.15% of residents were suffering from burnout.	The frequency percentage of burnout among married and second and third-year residents was significantly higher compared to other groups ($p < 0.05$).
Maghbouli, 53	2017	A tertiary hospital of Tehran University of Medical Sciences	Medical residents	204	92.2% of participants were suffering from burnout.	DP was significantly more prevalent in male residents ($p<0.05$).
Sepehrmanesh, 7	2012	Kashan and Isfahan Universities of Medical Sciences	Medical residents	160	The prevalence of burnout was 96.9%.	The prevalence of burnout was 98.9% in females and 94.5% in males. The mean score of burnout was significantly higher in single residents and first-grade residents ($p < 0.05$).

EE: Emotional exhaustion, DP: Depersonalization, PA: Personal accomplishment.

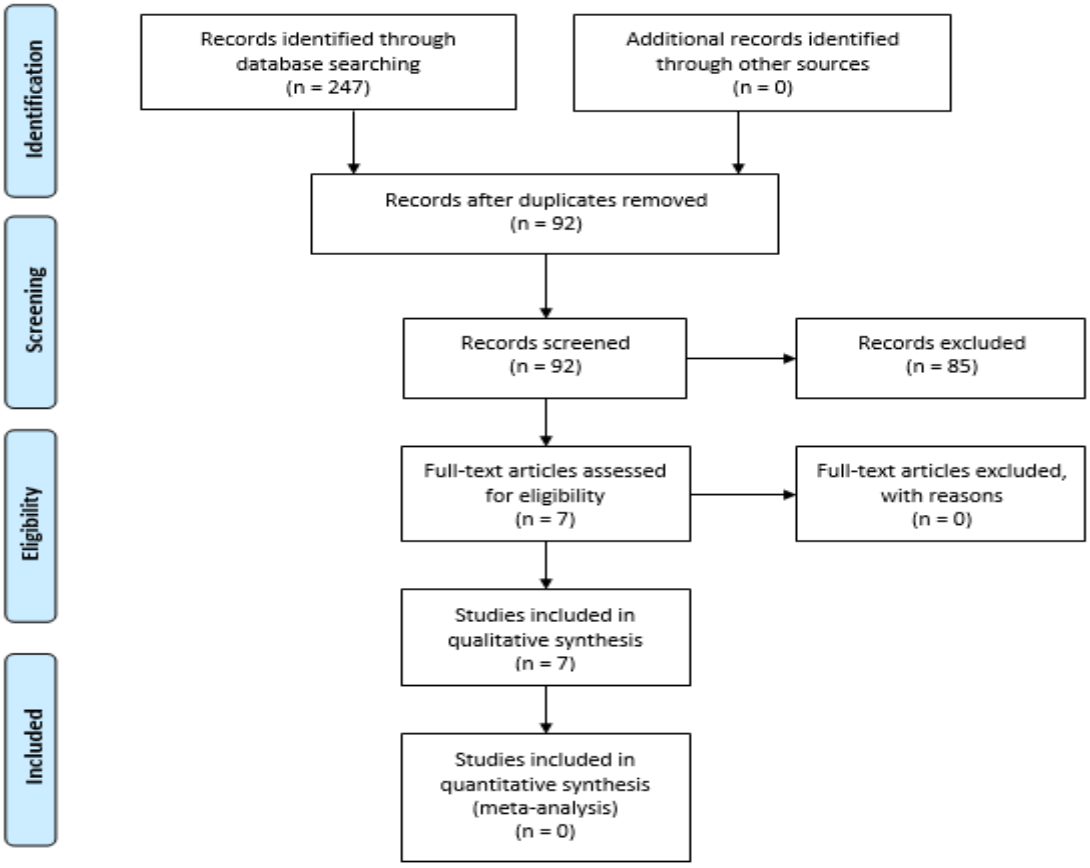

Fig.1: PRISMA Flowchart.

4- DISCUSSION

This study aimed to review current knowledge on professional burnout and related factors among Iranian medical residents. The results of seven related reviews showed that the overall burnout prevalence across all specialties was 82.1% (ranging from 67.4% to 96.9%). Additionally, 84.8% of medical residents reported high emotional exhaustion, 96.9% demonstrated high depersonalization, and 89.2% exhibited low personal accomplishment scores.

The health and treatment sector is one of the most important areas of sustainable development in human societies due to its direct relationship with human health, and the realization of this requires healthy and energetic medical staff with high work motivation. Among the employees of this area are medical residents, some of whom feel tired and exhausted after working for a while and face numerous problems and job stress (3, 27). Burnout is a term used to describe negative changes in the attitude, mood, and behavior of people faced with work-related pressure. The most common definition of professional burnout is attributed to Maslach and Jackson, who considered it a psychological syndrome consisting of three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment (54, 55). This syndrome occurs in response to long-term job stress and is more frequent in people whose jobs are in direct contact with other people (4, 5).

Due to the stressful patient-doctor relationship, the medical profession is considered one of the most stressful jobs, and can cause burnout in the treatment staff (7, 56). Occupational consequences and their effects on the health of medical personnel have been investigated in many

studies (27, 33, 57, 58). The findings show that chronic exposure to job stress is the strongest factor in creating job dissatisfaction, which makes a person suffer from professional burnout syndrome and can affect their social, psychological, and physiological health (59-62). Some studies indicate that working in stressful environments such as hospitals is associated with an increased risk of occupational injury, mental health disorders, and professional burnout (63-66).

Such environments are affected by a wide range of stressful factors, such as facing severe diseases and death of patients, large amounts of work, and role ambiguity. Long-term stress can also lead to burnout in medical personnel (67). If a person is not able to deal effectively with the stressful factors of the environment, various complications will appear in their body, mind, and behavior. Chronic stress may reduce job satisfaction and cause burnout (68, 69).

The reviewed studies suggest that residents, especially in the early years of training, are particularly vulnerable to burnout, with a prevalence rate ranging from 67.4% to 96.9% (7, 49). In addition, the mean professional burden of burnout was 84.44 ± 21.51 (out of 114) (48).

The beginning of the COVID-19 epidemic was associated with significant anxiety due to its unknown nature, high mortality, and lack of specific treatment (70-74). Medical staff and medical students were particularly exposed to this disease, which profoundly impacted their personal and family life (75). A study by Cao et al. (2020) revealed that 25% of medical students in China exhibited varying levels of anxiety (76). Some research indicates that COVID-19-related anxiety led to academic burnout among students (77, 78). Evidence shows that medical residency training is associated with high levels of physical and mental energy expenditure. Residents have to adapt to increased responsibility, long and variable shifts, sleep deprivation, constant responsiveness, physical fatigue, and heavy financial pressure. This level of stress during residency is inevitable and sometimes even beneficial because medical residents are responsible for the health of patients, and at the same time, they can improve their professional knowledge (79).

Medical residents suffer from high burnout rates (9, 19, 80). Different studies report varying burnout rates among medical residents, ranging from 18% to 82% (3). A review study (2022) examining the relationships between burnout in residents and patient care, medical errors, and professional misconduct revealed that increased burnout leads to more medical errors and diminished quality of patient care. Additionally, poor academic performance in educational exams was correlated with reported burnout levels (8).

The reviewed studies revealed that 84.8% of medical residents had high EE, 96.9% had high DP, and 89.2% demonstrated low PA scores. Additionally, EE was significantly higher in single and first-year residents compared to married and higher-grade residents ($p < 0.05$). Furthermore, the frequency of depersonalization scores was significantly higher in internal residents than in surgical residents ($p<0.05$).

Emotional exhaustion is the central symptom of professional burnout. A person who is emotionally exhausted feels under pressure, and their emotional resources are depleted. Depersonalization occurs when a person responds negatively to people who are usually recipients of services and care or treats them with indifference. Depersonalization reflects the negative attitude of the service provider towards its recipients. Therefore, after burnout, depersonalization is a highly specific and important factor in jobs related to human services. Reduced

personal accomplishment decreases the feeling of worthiness and the ability to perform tasks successfully. This dimension shows a person's negative evaluation of themselves in relation to work (1, 55, 56). According to the review results, it is necessary to provide more material, spiritual, and social attention and support to residents, especially single, first-year, and internal residents.

Based on the current review, there was a significant relationship between burnout and various factors, including age, gender, year of residency, marital status, lower academic rank, having a child, number of on-calls per month, working in the public sector, clinical learning environment, and spending less time in leisure and sports activities ($p < 0.05$).

Evidence shows that burnout among medical residents is prevalent due to observing patients' suffering, educational pressure, varying and contradictory responsibilities, and 24-hour working hours (48, 81, 82). This issue is critical from multiple perspectives and can potentially compromise the mental health of residents and lead to dissatisfaction among patients and their families with medical services.

The recognition and prevention of professional burnout are crucial for enhancing medical residents' mental health and improving their quality of life and service satisfaction (2, 8, 42). Effective interventions require a comprehensive approach addressing both organizational and individual factors (3, 35, 54). Workplace strategies include implementing working hour regulations by the Accreditation Council for Graduate Medical Education (ACGME), modifying workload, increasing task variety, reducing workplace stress, and providing targeted training such as stress management, emotional intelligence development, and mental health workshops (18, 36, 38).

Individual-centered interventions focus on holistic support mechanisms, including promoting professional interpersonal relationships, meditation practices, facilitating counseling service access, and encouraging regular exercise (33, 83-86). The current review suggests a notable decrease in burnout prevalence during the COVID-19 pandemic compared to previous years, potentially attributed to increased awareness and dedicated support for residents' professional challenges and well-being.

5- CONCLUSION

Considering the stressful patient-doctor relationship, the medical profession is one of the most stressful jobs and can cause burnout in the treatment staff. Burnout is a psychological syndrome that is very common among medical residents. It consists of emotional exhaustion, depersonalization, and reduced personal accomplishment. Based on the current review, 84.8% of medical residents had high emotional exhaustion (EE), 96.9% had high depersonalization (DP), and 89.2% had low personal accomplishment (PA) scores.

The reviewed studies suggest that the overall burnout prevalence for all residents was 82.1% (ranging from 67.4% to 96.9%). The mean professional burden of burnout was 84.44 ± 21.51 (out of 114), which is higher than the worldwide average. EE was significantly higher in single and first-year residents compared to married and higher-grade residents. Additionally, the frequency of depersonalization scores in internal residents was higher than in surgical residents. Significant relationships were found between burnout and various factors, including age, gender, year of residency, marital status, academic rank, having a child, number of on-calls, work sector, clinical learning environment, and time spent in leisure activities.

6- AUTHORS' CONTRIBUTIONS

Study conception or design: FM, ME; Data analyzing and draft manuscript preparation: HS, and ND; Critical revision of the paper: FM and HS; Supervision of the research: FM and ME; Final approval of the version to be published: FM, HS, ND, and ME.

7- CONFLICT OF INTEREST: None.

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