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ORIGINAL ARTICLE

Exploring the Prevalence of Burnout in Medical Residents: Socio-Demographic and Job Characteristics as Predictors in Iran

Shima Shakiba[1], Ahmad Sharifi[2], Farnaz Hashemi[3], Zahra Mazinani[4], Majid Sorouri[5], Ali Reza Safarpou[6], Elham Saranjam[7], Fereshteh Soltani[8], Shahin Merat[9], Reza Ghanbari[10], Hossein Poustchi[11]

[1,4]Department of Clinical Psychology, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
[2]Faculty of Psychology and Education, University of Tehran, Tehran, Iran
[3]Psychology Department, Faculty of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran
[5]Digestive Diseases Research Institute, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran
[6,8]Gastroenterohepatology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[7]School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran
[9,11]Gene Therapy Research Center, Digestive Diseases Research Institute, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran
[10]Liver and Pancreatobiliary Diseases Research Center, Digestive Disease Research Institute, Tehran University of Medical science. Tehran, Iran

ABSTRACT

Introduction: Burnout is a psychological syndrome that develops due to chronic stressors in a person's professional life, resulting in emotional exhaustion and detachment. The objective of this study was to determine the prevalence of burnout among medical residents, considering socio-demographic variables and job characteristics, and to predict burnout in this group. Medical residents often face specific pressures such as long working hours, sleep deprivation, high patient loads, and emotional demands from patient care, which contribute to their overall stress levels. **Methods:** A cross-sectional study was conducted in the academic year 2019-2020, involving 164 residents from two general hospitals who completed the Persian versions of the Job Content Questionnaire (JCQ) and Maslach Burnout Inventory (MBI-HSS). **Results:** A significant proportion of residents reported burnout symptoms, with 73.7% experiencing moderate to high levels of emotional exhaustion and 64.4% indicating moderate to high levels of depersonalization. Additionally, 90.1% of residents reported low perceived professional efficacy. Among the subscales of MBI-HSS, reduced professional efficacy was found to be the highest. Psychological demands and limited decision latitude were significant predictors of burnout, particularly in relation to emotional exhaustion and depersonalization. Conversely, support from family and co-workers, as well as higher levels of experience, were associated with lower depersonalization and improved professional efficacy. **Conclusion:** Overall, medical residents in Iran face significantly high levels of burnout, which are influenced by specific personal and job characteristics. Consequently, preventive and therapeutic interventions are necessary to address this pressing issues.

Keywords: burnout, medical residents, job characteristics, maslach burnout inventory, job content questionnaire

Corresponding Author:
Reza Ghanbari
Email: r.ghanbari98@gmail.com
Telephone: +98-21-82415141

INTRODUCTION

Recently, residents' burnout has garnered significant attention due to its increasing negative impact and far-reaching consequences on the health system, patients, and physicians (Low *et al.*, 2019; Harvey, 2020. Residency is an intensive training program that places overwhelming responsibilities on residents. They are expected to simultaneously enhance their knowledge and provide high-quality medical care to patients (Al Qannass and Al Ahmari, 2021). Throughout this demanding program, residents face various pressures, including heavy workloads, long working hours, night shifts, work-

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life imbalance, and the burden of paperwork and exams. Consequently, they are at a higher risk of experiencing burnout syndrome.

Burnout is a detrimental psychological syndrome that arises as a response to chronic emotional and interpersonal stressors in professional life, leading to emotional exhaustion and detachment (Edú-Valsania, Laguía and Moriano, 2022). The 11th Revision of the International Classification of Diseases (ICD-11) officially classifies burnout as an occupational phenomenon under the chapter "factors influencing health status or contact with health services" (World Health Organization, 2018). Burnout can result in increased medical errors, adverse effects on physicians' well-being, decreased productivity, job dissatisfaction, and depression. Furthermore, it can diminish motivation in education and job involvement during residency (De Hert, 2020).

Maslach (2003) defined job burnout by identifying three specific dimensions: emotional exhaustion, which refers to chronic stress and fatigue caused by job demands; depersonalization, characterized by negative attitudes toward patients and colleagues, expressed through cynicism and impersonal feelings; and reduced professional efficacy, involving feelings of incompetence and ineffectiveness in work domains (Maslach, 2003).

Factors contributing to burnout among medical residents encompass work-life balance challenges, including teamwork dynamics, workload management, chaotic work environments, and time constraints (National Academies of Sciences, Engineering, and Medicine, 2019). Research indicates that inadequate sleep and lack of recognition from residency programs significantly exacerbate burnout levels (Saintila *et al.*, 2024). A meta-analysis revealed a concerning burnout prevalence of 51.0% among medical residents, based on 22,778 participants. Subgroup analyses showed that radiology (77.16%), neurology (71.93%), and general surgery (58.39%) had the highest burnout rates, while psychiatry (42.05%), oncology (38.36%), and family medicine (35.97%) reported the lowest. Geographically, burnout rates varied significantly: several Asian countries had a prevalence of 57.18%, European countries reported 27.72%, and North America had a rate of 51.64% (Low *et al.*, 2019).

In Iran, residency training follows a seven-year medical school program, and after completing a mandatory service commitment, general practitioners are eligible to take the residency entrance exam. Many residents in Iran are married and often face financial challenges, an imbalanced professional-private life, work overload, fatigue, responsibility for patients' lives, and a fear of malpractice in this demanding course. Consequently, the prevalence of burnout symptoms among residents in Iran is expected to be high (Sheikhmoonesi *et al.*, 2017).

In addition, teaching hospitals have limited resources and are committed to providing high-quality medical services at low costs, which often results in overworking residents and failing to meet the needs of their patients (Soltanifar *et al.*, 2018). Furthermore, unstable economic conditions, partly due to the new round of sanctions against Iran in 2018, have imposed significant austerity on residents' social and professional lives (Kokabisaghi, 2018). Poverty alleviation efforts and the government's attempt to achieve health equity have had devastating effects on the healthcare system and medical service providers, including residents (Sheikhmoonesi *et al.*, 2017, Soltanifar *et al.*, 2018).

According to the Job Demand-Control-Social Support (JDCS) model, job demands and job control are the two main domains of any job. Job demands refer to workload, work pressure, and role ambiguity, while job control refers to decision authority and skill discretion (Portoghese *et al.*, 2020). An inappropriate balance between job demands and control, which may be characteristic of residency programs, can lead to detrimental affective and behavioral outcomes for workers, resulting in decreased job involvement and motivation (Steffgen Sischka and de Henestrosa, 2020).

The prevalence of burnout among Iranian residents has been reported to be higher than the average norms found elsewhere, ranging from 70% to even 90% based on different socio-demographic factors and job conditions (Rodrigues *et al.*, 2018, Soltanifar *et al.*, 2018). However, unlike in western societies, there is a lack of well-documented research on the association between burnout syndrome and the presumed contributing stressors among Iranian residents. Therefore, the current study aims to investigate the relationship between residents'

burnout and socio-demographic variables and job characteristics.

METHODS

Participants and Procedure

This cross-sectional study employed a non-randomized convenient sampling method to recruit 164 residents from two academic, urban grade 1 teaching hospitals—Shariati Hospital in Tehran, Iran, and Namazi Hospital in Shiraz, Iran—during the academic year 2019-2020. The study protocol was approved by the ethical committee of the National Institute for Medical Research Development (IR.NIMAD.REC.1396.302). Grade 1 hospitals are general hospitals located in large cities and known for providing a high number and quality of services and facilities. To collect data, questionnaires were distributed to residents in various departments during morning reports. Independent examiners briefly explained the content of the questionnaires to the participants before distribution. All questionnaires were anonymous, and participation in the study was voluntary.

The Socio-Demographic Questionnaire

This questionnaire consists of several questions related to sex, age, marital status, number of offspring, stage of residency, medical specialty, satisfaction levels, economic and educational satisfaction, living arrangements (with family or alone), and local/non-local status. Residents were considered locals if they were citizens of the city where they studied.

The Job Content Questionnaire (JCQ)

The Job Content Questionnaire (Karasek *et al.*, 2007) is a widely used instrument for assessing job conditions based on the recently revised job Demand-Control-Social support (JDCS) model. It consists of 53 self-report items that measure psychosocial occupational conditions. The questionnaire assesses three main domains: 1) decision latitude, which includes skill discretion and decision authority; 2) job demands, which encompass physical and psychosocial demands as well as job insecurity; and 3) social support, which includes supervisor and co-worker support. Additionally, the questionnaire provides subscales for depression, anxiety, job satisfaction, and physical exertion. Participants rate each item on a 3-point to 7-point Likert scale based on the corresponding subscale. Further details regarding the questionnaire's development, explanation, and validation among Iranian healthcare workers can be found in previous studies (Choobineh Ghaem and Ahmedinejad, 2011, Jabali *et al.*, 2013).

The Maslach Burnout Inventory-Human Service Survey (MBI-HSS)

The MBI-HSS is a self-report measure consisting of 22 items (Lin *et al.*, 2022). Each item is scored based on the frequency on a 6-point Likert scale, ranging from 0 (never) to 6 (everyday). The inventory assesses three dimensions of burnout: emotional exhaustion (9 items), depersonalization (5 items), and professional efficiency (8 items). The scoring for each dimension is as follows: for emotional exhaustion, a score of less than 13 indicates low exhaustion, a score between 14 and 26 indicates moderate exhaustion, and a score greater than 27 indicates high exhaustion. For depersonalization, a score of less than 5 indicates low depersonalization, a score between 6 and 9 indicates moderate depersonalization, and a score greater than 9 indicates high depersonalization. For professional efficiency, a score of less than 33 indicates low efficiency, a score between 34 and 39 indicates moderate efficiency, and a score greater than 40 indicates high efficiency (Alhaffar, Abbas and Alhaffar, 2019). The MBI-HSS has been found to be reliable and valid among the Iranian population (Shamloo *et al.*, 2017).

Statistical Analysis

For statistical analysis, the programming language R (R Core Team, 2019) was used. T-tests and one-way analysis of variance (ANOVA) were conducted to examine differences in burnout dimensions' scores between groups. The Job Content Questionnaire (JCQ) was used to measure psychosocial job characteristics, and socio-demographic variables were hypothesized as antecedents of burnout dimensions. To explain the variance of dependent variables and the associations with exploratory variables, a series of linear regression models based on stepwise forward selection were constructed. The number of entered variables in the model was kept within the recommended limitation of total cases $\geq 8 \times$ entered variables + 50 cases. Exploratory variables were

entered into the model in descending order based on the absolute magnitude of their correlation with the dependent variables. Correlations between a mixture of continuous and dichotomous variables were estimated using the mixedCor function from the R-package psych (Revelle, 2018). Participants with six or more unanswered questions (10% or more) on the JCQ scale were excluded from the analysis, while remaining missing values were replaced by modal values.

RESULTS

The sample consisted of 164 residents, with 42 males (25.6%), 88 females (53.7%), and 34 participants who did not state their gender (21%). The mean age of the participants was 32±4.7 years. Table 1 presents the socio-demographic characteristics of the participants.

Prevalence of Burnout Among Residents

Table 2 displays the Cronbach's α values for the JCQ scales in this study, indicating adequate to good internal consistency. For the three MBI-HSS dimensions, the Cronbach's α values were α = 0.85 for emotional exhaustion, α = 0.73 for depersonalization, and α = 0.83 for professional efficiency, showing adequate to acceptable internal consistency. However, it should be noted that some of the subscales' internal consistency is not satisfactory, which is consistent with previous research.

Descriptive statistics of the MBI-HSS and JCQ subscales, as well as the intensity levels of the MBI-HSS subscales, are presented in Table 3. Regarding the MBI-HSS scales, 118 (73.7%) residents reported moderate to high levels of emotional exhaustion, and 103 (64.4%) residents stated moderate to high levels

Table 1. Participants' Socio-demographic Characteristics (n = 164)

Characteristics	Value	Characteristics	Value
Age- Mean (SD)		**Specialty- n (%)**	
Male	34 (6.5)	Internal surgery	44 (27)
Female	31 (3.2)	Orthopedics	19 (12)
Total	32 (4.7)	Cardiology	18 (11)
Sex- n (%)		Obstetrician	18 (11)
Male	42 (26)	Anesthesiologist	3 (2)
Female	88 (54)	Neurology	8 (5)
Unstated	34 (21)	Pediatrician	21 (13)
Marital status- n (%)		Psychiatrist	12 (7)
Single	53 (32)	Radiology	5 (3)
Married	70 (43)	Pathology	1 (1)
Unstated	41 (25)	Urology	1 (1)
Years of residency- n (%)		Unstated	14 (9)
1st	42 (26)	**Number of Children- n (%)**	
2nd	49 (30)	No child	97 (52)
3rd	21 (13)	One child	12 (7)
4th	16 (10)	Two children	11 (7)
Unstated	36 (22)	Unstated	44 (27)
Locality*- n (%)		**Specialty satisfaction- n (%)**	
Locals	82 (50)	Low	13 (7.9)
Non-Locals	79 (48)	Moderate	15 (9.1)
Unstated	3 (2)	High	136 (82)
Economic satisfaction- n (%)		**Participation satisfaction- n (%)**	
Low	87(53)	Low	19 (11.5)
Moderate	19(11.5)	Moderate	17 (10.3)
High	67(40.8)	High	124 (75.6)
Unstated	1(0.6)	Unstated	4 (2.4)

*Residents are defined as locals if they are citizens of the city where they study.

of depersonalization, suggesting relatively high rates of burnout among residents. Moreover, 90.1% of residents are experiencing low levels of perceived professional efficacy.

The relative mean scores for the JCQ subscales indicate that residents are exposed to considerable occupational stress in almost all job domains. Psychological demands and decision latitude display the highest relative mean scores. Job insecurity, supervisor and coworker support are ranked second, with scores ranging from 0.6 to 0.69. The least affected job domain is physical demands, with scores within the range of 0.4 (Table 3).

Table 2. The Cronbach's α for the JCQ subscales

Job Content Questionnaire Subscales	α
Decision latitude	
Skill discretion	0.51
Decision authority	0.43
Total (Decision latitude)	0.63
Job demands	
Physical demands	0.79
Psychological demands	0.72
Job insecurity	0.26
Social support	
Supervisor support	0.85
Co-worker support	0.78
Other	
Depression	0.95
Anxiety	0.82
Job satisfaction	0.76

Differences Based on Demographics

There was no significant difference between the scores of males and females on the MBI-HSS subscales. However, a difference was observed based on marital status, with being married associated with higher professional efficacy ($P<0.05$). Among married couples, those who had children reported lower emotional exhaustion ($P<0.01$) and lower depersonalization ($P<0.05$), but no significant difference was found in professional efficacy.

Professional efficacy was significantly higher in non-local students than in locals ($P<0.001$), but no significant difference was observed for other MBI-HSS subscales. Living alone was associated with higher scores on emotional exhaustion ($P<0.01$) and depersonalization ($P<0.01$), but there was no significant difference in professional efficacy.

Participants who declared their specialty to be their favorite showed significantly higher scores on depersonalization ($P<0.05$), but no significant difference was found in other MBI-HSS subscales. Having close friends was not associated with any significant differences in MBI-HSS subscales.

High specialty satisfaction was associated with lower emotional exhaustion ($P<0.001$) and depersonalization ($P<0.05$); however, this difference was insignificant for professional efficacy. High economic satisfaction was associated with lower emotional exhaustion ($P<0.001$) and depersonalization ($P<0.05$), and participants with low or moderate economic satisfaction reported higher professional efficacy ($P<0.01$).

Table 3. Descriptive statistics of JCQ, MBI-HSS scores and intensity levels among residents

	Mean	SD	95% CI			
MBI-HSS scales				**Low level N (%)**	**Moderate level N (%)**	**High level N (%)**
Emotional exhaustion	25.86	11.02	24.14–27.58	42(26.3)	41(25.6)	77 (48.1)
Depersonalization	8.64	6.18	7.67–9.60	57(35.6)	40 (25.0)	63 (39.4)
Professional efficacy	26.46	9.56	24.96–27.95	16(10.0)	30 (18.8)	114 (71.3)
JCQ scales				**Min**	**Max**	**Relative mean***
Decision latitude	31.62	4.02	31.00–32.24	19	41	0.703
Psychological demands	18.96	3.35	18.44–19.48	11	25	0.758
Job insecurity	9.45	1.94	9.15–9.75	5	15	0.630
Supervisor support	11.91	3.58	11.36–12.47	4	20	0.596
Coworker support	13.82	2.43	13.45–14.2	5	20	0.691
Physical demands	6.36	3.96	5.74–6.97	0	16	0.397

SD, Standard Deviation; JCQ, Job Content Questionnaire, MBI-HSS, Maslach Burnout Inventory-Human Services Survey.

*Relative mean = mean / (number of questions × number of options for questions).

Variance Analysis

Levene's test showed homogeneity of variance across different residency year groups for all the MBI-HSS subscales. Conducting one-way ANOVA, no significant difference was found in emotional exhaustion and depersonalization scores across groups; however, there was a significant difference in professional efficacy (P<0.05). Tukey's multiple pairwise-comparisons test results indicated that professional efficacy was significantly higher in 4th-year residents compared to 1st-year residents (P<0.05) and 2nd-years (P<0.05), yet the difference among other groups was insignificant.

Table 4 shows the association between MBI-HSS and JCQ subscales. Emotional exhaustion is significantly correlated with all the JCQ subscales, showing relatively strong associations (P<0.001). Depersonalization is significantly associated with skill discretion, decision authority, supervisor support, and job satisfaction (P<0.001). Similarly, there was a significant correlation between professional efficacy and skill discretion, decision authority, and co-worker support (P<0.001).

Stepwise Linear Regression Analysis

Next, stepwise linear regression analysis was conducted to determine which job characteristics and socio-demographic variables contribute to the prediction of burnout dimensions. Introducing decision latitude as a single variable in regression

Table 4. The Correlation Between MBI-HSS and JCQ Scales (n = 164)

	Emotional exhaustion	Depersonalization	Personal efficacy
Skill discretion	-0.26**	-0.23**	0.25**
Decision authority	-0.25**	-0.18*	0.18*
Psychological demands	0.42***	—	—
Job insecurity	0.29***	—	—
Supervisor support	-0.3***	-0.21**	_
Coworker support	-0.18*	—	0.26**
Physical demands	0.19*	—	—

*P<0.05; **P<0.01; ***P<0.001

Table 5. Regression Coefficients

Criterion variables	Predictive variables	Beta	Estimate	Std. Error	t value	Pr (>|t|)
Emotional Exhaustion	(Intercept)	0	33.333	8.093	4.119	0.000
	Psychological demands	0.371	1.243	0.25	4.963	0.000
	Job insecurity	0.014	0.076	0.434	0.175	0.862
	Specialty satisfaction	0-.296	-1.579	0.407	-3.878	0.000
	Study participation contentment	-0.105	0.495	0.357	-1.389	0.167
	Decision latitude	-0.188	-0.507	0.185	-2.736	0.007
Depersonalization	(Intercept)	0	25.596	3.791	6.752	0.000
	Living with family	-0.214	-2.802	0.99	-2.831	0.005
	Study participation contentment	-0.249	-0.661	0.2	-3.303	0.001
	Decision latitude	-0.208	-0.315	0.111	-2.826	0.005
Professional Efficacy	(Intercept)	0	7.554	4.966	1.521	0.131
	Locality	-0.336	-6.615	1.732	-3.819	0.000
	Stage of residency	0.168	1.625	0.813	1.999	0.048
	Coworker support	0.27	1.007	0.322	3.126	0.002
	Married	0.252	4.981	1.657	3.006	0.003
	Economic satisfaction	-0.268	-0.964	0.319	-3.024	0.003
	Study participation contentment	0.233	0.935	0.358	2.614	0.010

*P<0.05; **P<0.01; ***P<0.001

Table 6. Goodness of Fit Indexes for Regression Models

Regression model	R	R2	R2Adjusted	Residual SE	Overall F	df1	df2	p-value
Emotional exhaustion	0.60	0.36	0.34	8.98	16.58	5	149	0.000
Depersonalization	0.43	0.19	0.17	5.63	11.47	3	151	0.000
Professional efficacy	0.58	0.33	0.29	8.22	8.30	6	99	0.000

*P<0.05; **P<0.01; ***P<0.001

equations instead of its subscales provided a better explanation of variance in all dependent variables; therefore, we opted for decision latitude in regression models. The regression coefficients and goodness of fit indexes for the stepwise linear regression models are presented in Tables 5 and 6. As revealed in the tables, most of the correlation coefficients were statistically significant. The results of the regression models indicated that three predictors - psychological demands (β = 0.37, P<0.001), specialty satisfaction (β = -0.29, P<0.001), and decision latitude (β = -0.18, P<0.007) - explained 36% of the emotional exhaustion variance. Similarly, living with family (β = -0.21, P<0.005), study participation contentment (β = -0.24, P<0.001), and decision latitude (β = -0.20, P<0.005) accounted for 19% of the depersonalization variance. Finally, 33% of professional efficacy was preliminarily an outcome of stage of residency (β = 0.16, P<0.048), coworker support (β = 0.27, P<0.002), study participation contentment (β = 0.23, P<0.010), economic satisfaction (β = -0.26, P<0.003), being local (β = -0.33, P<0.001), and being married (β = 0.25, P<0.003).

DISCUSSION

In the current study, the prevalence of burnout was notably high compared to a meta-analysis that reported the overall prevalence of burnout in medical residents (Low *et al.*, 2019). A significant percentage of residents reported experiencing moderate to severe burnout symptoms. While all dimensions of burnout showed moderate to high rates, professional efficacy demonstrated the highest rate, suggesting its important contributing role in residents' burnout. However, this finding contrasts with the theory and some recent evidence, which assert that emotional exhaustion is the prominent feature of burnout syndrome (Abdulrahman *et al.*, 2018, Rodrigues *et al.*, 2018).

According to a meta-analysis on medical residents in different geographical regions, burnout prevalence was higher in several Asian countries compared to Europe and North America. This difference is assumed to be due to factors such as long working hours, lack of autonomy (the degree of control an individual has over their work), imbalance between private and professional life, and role ambiguity (Low *et al.*, 2019). Work conditions in Europe are more regulated, as the European Working Time Directive (EWTD) imposes a 48-hour average weekly limit with strict compliance rules. On the other hand, the American Accreditation Council for Graduate Medical Education (ACGME) allows 80-hour shifts per week (Temple, 2014), which may not be as tightly regulated in Middle Eastern countries.

In this study, we examined several socio-demographic variables associated with burnout, including sex, marital status, having children, locality, living alone, specialty satisfaction, economic satisfaction, and stage of residency. The results showed that being male or single was associated with the highest burnout rate, while married residents experienced the least symptoms and higher professional efficacy. These findings suggest that having a supportive spouse could reduce the pressure and anxiety during residency. Interestingly, among married residents, those who had children reported lower emotional exhaustion and depersonalization, indicating that raising children may enhance coping abilities and help overcome depersonalization and emotional detachment.

Living alone was also associated with higher levels of emotional exhaustion and depersonalization. Thus, unmarried residents living alone are expected to experience more burnout, possibly due to the lack of family support. However, non-local residents who are likely living away from their families reported higher professional efficacy. This could be attributed to the feelings of achievement, personal independence, and responsibility experienced through living in another city away from one's family. Residents whose specialty was among their favorites reported significant depersonalization. It is plausible that in such a self-determinant situation, they may have experienced cognitive dissonance and lacked cognitive strategies to cope with this situation, leading to a higher burnout rate. In a study conducted

by Dopmeijer et al (2022), researchers explored the impact of performance pressure, loneliness, and sense of belonging on job burnout symptoms among university students. The findings revealed a significant association between performance pressure and elevated levels of emotional exhaustion and depersonalization. Specifically, students experiencing high performance pressure were more likely to feel emotionally drained and disconnected from their academic responsibilities. Conversely, those who reported a strong sense of connection to their university and peers exhibited lower levels of emotional exhaustion and depersonalization. Additionally, the study indicated that loneliness could stem from factors outside the academic environment, which may account for why some students experienced high levels of burnout without feeling lonely (Dopmeijer *et al.*, 2022).

On the other hand, specialty satisfaction was associated with reduced emotional exhaustion and depersonalization. However, this finding requires further exploration, particularly in terms of unsatisfied rewards, unmet expectations, and economic burdens. Additionally, residents who were more economically satisfied reported lower emotional exhaustion and depersonalization. Interestingly, low to moderate economic satisfaction was associated with higher professional efficacy, which contradicts previous findings. This suggests the potential use of coping strategies when facing an economic burden.

When examining the stage of residency, it was observed that residents' burnout increased to 50% by the end of the first year, with notable rises in depersonalization and emotional exhaustion. In this study, junior residents exhibited the highest level of burnout, possibly due to the sudden need to adapt to the demands of the resident-physician lifestyle. On the other hand, senior residents maintained a satisfactory level of professional efficacy, benefiting from their accumulated experience, higher position in the hierarchy, which ensured safety and respect, and a reduced workload. They also developed a stronger professional identity. However, in Iran, residency training imposes heavy workloads and numerous night shifts on junior residents, leaving them under more pressure and struggling with a lack of expertise, respect, and a fully-formed professional identity (Rahimi *et al.*, 2024).

Certain job content subscales and socio-demographic variables were found to contribute significantly to predicting burnout dimensions. Specifically, psychological demands (the mental requirements imposed by a job, including aspects such as time constraints or workload intensity), decision latitude (the amount of control an individual has over their work), and specialty satisfaction emerged as the most influential predictors of emotional exhaustion. In other words, higher psychological demands, lower decision latitude, and lower specialty satisfaction were associated with increased emotional exhaustion. This suggests that psychological demands and decision latitude have a greater impact on burnout compared to other job conditions. Furthermore, professional efficacy was predicted by factors such as co-worker support, stage of residency, economic satisfaction, satisfaction with study participation, marital status, and locality. The results of our study align with previous research examining the impact of colleague support on employees' emotional commitment. Their findings indicate that both instrumental and emotional support from coworkers are positively and significantly associated with employees' emotional attachment to their organization. Additionally, job satisfaction was identified as a mediator in the relationship between both types of coworker support and affective commitment (Darke *et al.*, 2024).

It has been observed that residents who were not locals in the city where they attended their residency courses or were less economically satisfied felt more professionally efficient. Additionally, married residents or those in their fourth year of residency reported higher professional efficacy, presumably due to the experience gained in their field of expertise after working for several years or the social support provided by their spouse. Social support emerged as an essential factor, as more co-worker support was predictive of higher professional efficacy, and living with family was associated with lower depersonalization. These findings align with existing literature that proposes social support as a protective factor in reducing and moderating burnout (Huang *et al.*, 2019, Verougstraete and Idrissi, 2020). Lastly, living with family, decision latitude, and satisfaction with study participation were found to predict depersonalization. Residents who reported higher satisfaction with participating in this study experienced relatively higher professional efficacy and lower depersonalization. This suggests that residents with lower levels of burnout may have been more willing to take part in the study initially.

Decision latitude emerged as a significant predictor of burnout, particularly in relation to

emotional exhaustion and depersonalization, which are core characteristics of burnout in the Job-Demand-Control model. According to this model, when individuals face psychological strain, an imbalance between job demands and decision latitude can have the most detrimental effects. Work conditions that impose high strains on individuals can lead to problems such as burnout or compromised well-being (De Hert, 2020). These problems are characterized by considerable elevations in depression, anxiety, and job satisfaction subscales. The current findings suggest that residents are experiencing excessive job demands along with low control. Factors such as lack of autonomy, irregular work schedules, mundane tasks, pressures, and expectations may contribute to a lack of empathy and emotional distancing from patients, emotional cynicism, and depersonalization (Office of the Surgeon General, 2022). It is important for institutions to consider strategies that enhance decision latitude. For instance, increasing decision-making power for residents can empower them to manage their workloads more effectively and foster a sense of ownership over their responsibilities. This could include providing residents with greater input in scheduling shifts or allowing them to select specific tasks that align with their interests and strengths. Moreover, creating a supportive work environment through improved family and co-worker support can serve as a protective factor against burnout. Encouraging open communication among colleagues and offering resources for mental health support can help cultivate a culture of empathy and understanding. Establishing mentorship programs or peer support groups may also help residents navigate the challenges of their roles more effectively.

One possible explanation for this could be that residents have higher expectations of autonomy in practice, even if they are not yet fully trained in medicine. Perceived autonomy plays an essential role in reducing emotional exhaustion and depersonalization, acting as a resource for improving energetic and motivational processes (Tahar *et al.*, 2023).

CONCLUSION

This study found that residents in Iran are experiencing significant levels of burnout, with moderate to severe symptoms across three dimensions of the MBI-HSS. Burnout reduces their professional efficacy. Certain job conditions and socio-demographic variables increase the risk of burnout, especially for male residents, those who are single, less experienced, less interested in their specialty, not living with family, local to the city where they practice, more economically satisfied, and facing higher psychological demands with limited decision latitude. Family and co-worker support can help reduce depersonalization and improve professional efficacy. However, this study has limitations, including a small sample size and recruitment from only two hospitals, which may limit the generalizability of the findings to other countries or healthcare systems. Additionally, the cross-sectional design prevents establishing causality, and residents experiencing less burnout may have been more likely to participate. Further research should aim to replicate these findings in larger populations and explore interventions targeting the identified predictors and protective factors.

CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTION

Conceptualization: SS, HP, SM
Methodology: AS, ES, FS
Formal Analysis: AS
Investigation: AS, FH, ZM, MS, ARS, ES, FS
Data Curation: SS, AS
Writing Original Draft: ZM, RG
Review and Editing: SS, AS, FH, ZM, MS, ARS, ES, FS, SM, RG, HP
Supervision: SS, HP
Project Administration: SS, RG, HP
Funding Acquisition: SM

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