

## RESEARCH ARTICLE

# The Frequency of Burnout among Iranian Orthopedic Surgeons and Residents

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## Abstract

**Background:** Burnout is an emotional, psychological, and physical exhaustion syndrome with feelings of negativism toward one's job and reduced attention to clients. This complication is caused by the lack of control over work-related stress. Physicians, especially surgeons, are at higher risk for burnout due to critical responsibility and heavy workload. Given the importance and consequences of this dilemma, the present study aimed to investigate the frequency of burnout among orthopedic surgeons and residents.

**Methods:** The present cross-sectional, analytical study was conducted in 2019 in the cities of Tehran and Yazd, in Iran. A total of 180 orthopedic surgeons and residents participated in the study. A demographic characteristics form and the Maslach Burnout Inventory (MBI) were employed to assess burnout in the participants.

**Results:** The mean age of the participants was 42.8 years, and 94.4%, 23.9%, 52.2%, and 23.9% of the participants were male, residents, general orthopedic specialists, and fellowship-trained orthopedics, respectively. Out of 180 participants, 90 (50%) cases were suffering from burnout, of whom 26.7%, 16.1%, and 7.2% got a pathological score in one, two, and three criteria. No significant relationship was observed between burnout and gender, marital status, years of experience, and the average number of surgeries per week. However, 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.

**Conclusion:** The prevalence of burnout (50%) among orthopedists was remarkable and worrying. The frequency of burnout was higher among residents and the ones working in the public sector. This study demonstrates that the issue of burnout and its related risk factors have to be addressed in Iranian orthopedic surgeons and residents.

**Level of evidence:** IV

**Keywords:** Burnout, Orthopedic resident, Surgery

## Introduction

Burnout is defined as an emotional, psychological, and physical exhaustion syndrome with feelings of negativism toward one's job and reduced attention to clients. Burnout is a long-term response to work-related stressors and intense emotions. It is not the symptom of job stress but the result of a lack of control over it (1, 2).

Burnout has turned into a social concern in recent years and according to a study conducted in the United

States, 46% of physicians suffered from it (3).

Occupational factors, such as constant contact with patients suffering from pain and illnesses, long working hours, and a high amount of stress put physicians and nurses at the risk of burnout (4, 5).

Surgeons of different surgical specialties, including orthopedics, are at a higher risk for work-related stress and burnout due to performing high-risk surgeries, surgery complications for patients, long-

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hour surgeries, and the difficulty of orthopedic surgical procedures (6, 7).

The consequences of occupational burnout are multiple and include decreased quality of life, the negative impact on family relationships, association with cardiovascular disease, depression, frustration, moral disorders, temperament problems, and addiction, in the realm of personal life (8, 9). It can also cause dissatisfaction and loss of interest in one's job and may lead to job absence or even withdrawal (10).

A wide range of negative impacts of burnout on the working quality of physicians includes increased medical errors, increased treatment cost due to inappropriate paraclinical requests and diagnostic practices, the dissatisfaction of clients and patients, and decreased quality of services provided (11, 12).

Results of a study performed in France (2017) on 441 orthopedic surgeons showed that 39% and 10% of the subjects suffered from burnout and severe burnout, respectively (9).

Evaluation of the burnout status can help health managers plan more carefully and predict the resilience of that group in crises.

Although researchers have studied burnout in orthopedic surgeons and residents in some other countries, the difference in working conditions, moods, societal conditions, culture, and beliefs in Iran can affect the outcomes. Therefore, the present study aimed to evaluate the frequency and factors associated with occupational burnout in orthopedic specialists and residents in Iran.

### Materials and Methods

The present cross-sectional, analytical study was conducted in Tehran and Yazd cities, Iran, in 2019.

The study protocol was approved by the Ethics Committee of Shahid Sadoughi University of Medical Sciences, Yazd, Iran (IR.SSU.REC.1398.226). Participation in the study was voluntary and based on willingness, and the participant's information was kept confidential.

The study population included Iranian orthopedic specialists and residents. In total, 55 orthopedic surgeons in the city of Yazd, Iran, were sampled using the census method and 5 refused to participate in the study. Sampling in Tehran was performed at the annual congress of the Iranian Orthopedic Association using the systematic random method. One out of the three orthopedic surgeons was selected. A total of 150, and 20 refused to cooperate. The researcher referred to the participants to place questionnaires at their disposal.

Data were collected using the Maslach Burnout Inventory (MBI) and a demographic characteristics form. The MBI includes 22 items in three dimensions of emotional exhaustion, depersonalization, and personal accomplishment. Each item is scored on a 7-point Likert scale from 0 (never) to 6 (every day). The MBI scoring key is shown in Table 1. A high score in any dimension is considered a sign of burnout (1, 13-15). In terms of severity, burnout was categorized

**Table 1. MBI score in Orthopedic Surgeons and Residents**

MBI	Number(Percent)	Mean Score
Emotional exhaustion	180 (100%)	21.5 (0-54)
High ( $\geq 30$ ) (pathological)	49 (27.2%)	
Moderate (18-29)	53 (29.5%)	
Low ( $\leq 17$ )	78 (43.3%)	
Depersonalization	180 (100%)	5.9 (0-29)
High ( $\geq 12$ ) (pathological)	29 (16.1%)	
Moderate (7-11)	34 (18.9%)	
Low ( $\leq 6$ )	117 (65%)	
Personal accomplishment	180 (100%)	34.8 (5-48)
Low ( $\leq 33$ ) (pathological)	67 (37.2%)	
Moderate (34-39)	42 (23.3%)	
High ( $\geq 40$ )	71 (39.5%)	

as mild, moderate, and severe, based on having one, two, or three pathological criteria, respectively. The MBI has been used in similar studies, and its reliability and validity have been confirmed. The internal reliability of MBI was reported to be between 0.71 and 0.90 using Cronbach's alpha coefficient, and its repeatability coefficient was estimated to be 0.60 and 0.80 (16-18).

The demographic characteristics form included such items as age, gender, marital status, academic rank, working in the public or private sector, years of experience in the related field, the average number of surgeries per week, and the average hours spent in leisure and sports activities per week.

The data were analyzed using SPSS software (Version 17) after the completed questionnaires were collected and reviewed. The qualitative variables were compared using the Chi-squared test, and the results were expressed as frequency percentages. In addition, the results of quantitative variables comparison were presented as means. The binary logistic regression was used to determine the relationship between each independent variable and the research dependent variable (burnout). A *p-value* less than 0.05 was considered to be statistically significant.

### Results

A total of 180 orthopedic surgeons and residents including 170 (94.4%) males and 10 (5.6%) females with a mean $\pm$ SD age of 42.8 $\pm$ 11.17 years (ranged 27-74) participated in this study. In total, 150 (83.3%) and 30 (16.7%) cases were married and single, 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. Moreover, 75 (41.7%), 32 (17.8%), and 73 (40.6%) of the cases worked only in the public sector, the private sector, and both public and private sectors. The mean $\pm$ SD work experience of participants was

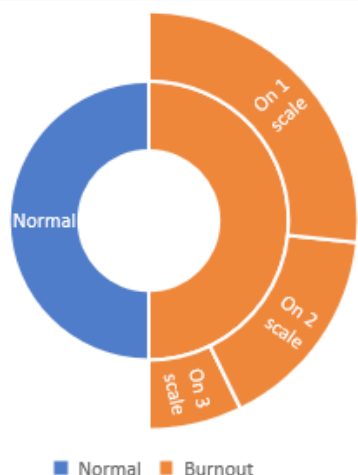
**Table 2. Percent of orthopedic attendings, fellows, and residents with varying levels of burnout.**

	Normal	Burnout		
		On 1 scale	On 2 scale	On 3 scale
Number	90	48	29	13
Percent	50%	26.7%	16.1%	7.2%
Total	90	90		
	50%	50%		

10.2±11.4 years (ranged 1-46), and the average number of surgeries was obtained at 15.7 per week (ranged 0-60). The average time spent in leisure activities (e.g., going to parties, cinemas, travel) and sports was 5 (ranged 0-40) and 2.3 (ranged 0-20) hours per week, respectively.

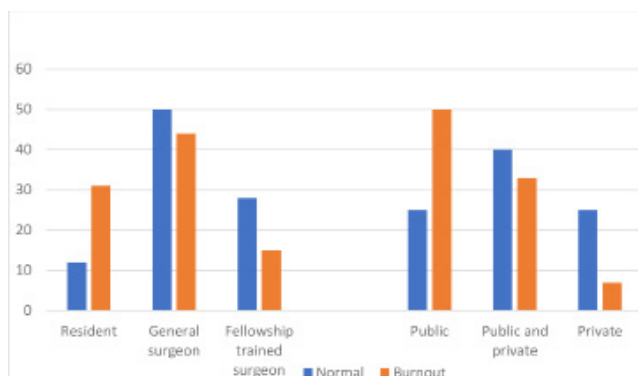
In total, 90 (50%) cases were suffering from occupational burnout, and the rest were normal with no pathologic score. In subjects with burnout 48 (26.7%), 29 (16.1%), and 13 (7.2%) had one, two, and three pathological criteria [Table 2]. Furthermore, 27% (49), 16% (29), and 37% (67) of burnout cases were suffering from emotional exhaustion, depersonalization, and low personal accomplishment [Table 1].

The results showed no significant relationship between burnout and gender, marital status, years of working experience, and the number of surgeries per week. However, burnout was significantly associated with academic rank ( $P=0.002$ ), working status in the public or private sector ( $P=0.000$ ), age ( $P=0.002$ ), amount of leisure activities ( $P=0.005$ ), and sport ( $P=0.005$ ) [Table 3, Figure 1, 2]. The chance of burnout was higher in those who spent less than 3.5 h on leisure activities, compared to those spending more than 4 h per week (OR=2.3) in such activities. Moreover, the chance of burnout was 2.3 times higher in the cases



**Figure 1. This is a figure, that blue represents the normal and orange signs of burnout, burnout is divided into three parts.**

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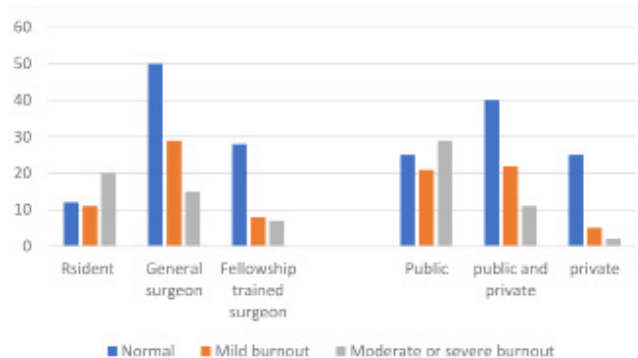


**Figure 2. This is a figure Shows the values of degree and work status in terms of burnout in Orthopedic Surgeons and Residents.**

who exercised less than 1h than those exercising more than 1.5 h per week (OR=2.3)

In terms of severity, mild burnout and moderate or severe burnout were observed in 48 (26.7%) and 42 (23.3%) cases, respectively. The relationship between burnout severity and the academic rank was also significant ( $P=0.000$ ), and moderate or severe burnout was mostly seen among residents compared to those with higher ranks. Burnout severity had also a significant relationship with working status ( $P=0.000$ ). Moderate or severe burnout was more frequent among the ones working in state centers [Figure 3].

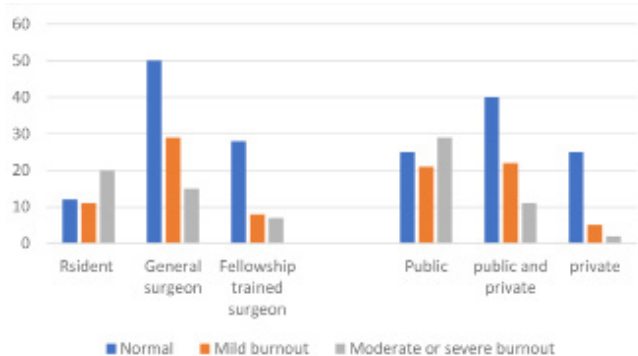
The binary logistic regression was utilized to determine the effect of each independent variable on the dependent variable (burnout). The results indicated that spending time in leisure activities ( $P=0.049$ ) and working status ( $P=0.016$ ) were strongly associated with burnout. Moreover, the cases who only worked in the public sector were six times more at risk of developing occupational burnout than those working in both the public and private sectors. In addition, the frequency of occupational burnout was three times higher in the cases who worked in the public and private sectors than those who only worked in the private sector.



**Figure 3. This figure shows the values of degree and work status in terms of the severity of burnout in orthopedic surgeon attendings, fellows, and residents.**

**Table 3. Analysis of the relationship between demographic factors and burnout**

		Normal N(%)	Burnout N(%)	Total N(%)	Average	P-value
Age	27-34	18(31%)	40(69%)	58(100%)	42.8 (27-74)	0.002
	35-49	43(61.4%)	27(38.6%)	70(100%)		
	50-74	29(55.8%)	23(44.2%)	52(100%)		
Years of work history	1-7	39(43.8%)	50(56.2%)	89(100%)	11.4 (1-46)	0.101
	8-46	51(56%)	40(44%)	91(100%)		
Number of surgeries per week	0-12	46(51.1%)	44(48.9%)	90(100%)	15.7 (0-60)	0.766
	13-60	44(48.9%)	46(51.1%)	90(100%)		
Fun hours per week	0-3.5	36(39.6%)	55(60.4%)	91(100%)	5 (0-40)	0.005
	4-40	54(60.7%)	35(39.3%)	89(100%)		
Exercise hours per week	0-1	35(39.3%)	54(60.7%)	89(100%)	2.3 (0-20)	0.005
	1.5-20	55(60.4%)	36(39.6%)	91(100%)		
<b>Total</b>		90(50%)	90(50%)	180(100%)		



**Figure 4. This is a figure Shows the values of degree and work status in terms of the severity of burnout.**

**Discussion**

The study hypothesis was that occupational burnout may be different in Iranian orthopedic surgeons and residents compared to their counterparts in other countries. Iran has a different health care system and surgeons usually have lower-income and more working hours compared to their peers in European and American countries. Doctors in Iran often spend the afternoon until late at night in clinics, which reduces their rest and recreation time and limits their social relationships. Moreover, the economic sanctions and rising inflation have increased the economic pressure on both people and doctors in Iran. This condition can reduce the tolerance of society and may lead to personal and interpersonal tensions. It is worth mentioning that

Iranian people are mainly religious. Moreover, they have great respect for physicians and trust them.

The study results showed a significant prevalence of burnout in Iranian orthopedic surgeons with a higher frequency among residents and those working only in the public sector, similar to other countries. Inversely, the frequency of occupational burnout was lower among the cases who spent more time in leisure and sports activities.

Based on the obtained results, 50% of the participants in the present study suffered from burnout. In a comprehensive study conducted on 5,197 physicians from different specialties in the United States in 2017, Shanafelt et al., observed burnout in 43.9% of the cases, with the rate of 40% among orthopedists (19). In a study performed by Faivre et al. on 441 orthopedists in France, burnout was observed in 39% of the participants (9). Another study reported 28% burnout among orthopedic surgeons in the United States (20). In the study conducted by Shanafelt et al. female gender and being married were associated with occupational burnout which was inconsistent with the results of the present study (19). However, it should be noted that the number of female participants was almost negligible in the present study. Although being married can increase emotional support, it may also increase financial concerns and the challenges of solving family matters and saving extra time to spend with family.

The results of the current study indicated that orthopedic residents had a higher chance of burnout compared to general orthopedic specialists and fellowship-trained surgeons. This difference can be

attributed to various reasons, such as lower financial income, higher workload, more working hours on night shifts, and shorter sleeping duration in residents. The frequency of burnout was estimated at 72.1% in residents. The results of the study conducted by Alsheikh et al. in Saudi Arabia revealed that 56.3% of 142 orthopedic residents suffered from burnout, and similar to the findings of the present study, gender, and marital status was not associated with burnout (21). In another study conducted by Sargent et al. in the United States, it was revealed that 56% of 384 orthopedic residents suffered from burnout. Furthermore, in line with the results of the current study, the rate of burnout was higher in orthopedic residents compared to that in orthopedic surgeons (28% of 264 orthopedic surgeons) (20). The prevalence of burnout among Iranian orthopedic residents was significantly higher than their peers in the two later studies. In two studies performed on residents of different medical specialties in Iran, the frequency of burnout was reported to be 92% (n=204), and 96% (n=160) (22, 23). These results indicate a high prevalence of occupational burnout among Iranian residents which confirms the findings of the present study. In Iran, no residency program involves specific rest times after a certain working hour. Usually, the working environment of these residents lacks suitable welfare facilities and they have very low incomes.

In a review study of burnout in orthopedic residents, 37.2%, 48%, and 33.1% of cases were suffering from emotional exhaustion, depersonalization, and low personal accomplishment, which were similar to the rates obtained in the present study corresponding to 27%, 16%, and 37%, respectively (24).

The results of the present study indicated an association between burnout with age and working status, similar to the findings of Faivre et al. and Sargent et al. (9, 20). According to the findings of this study and similar studies, young people are more prone to burnout due to such reasons as more enthusiasm for higher income through overworking, high level of stress, and fear of making mistakes due to the lack of enough skills and experience (25).

Those who work only in the public sector, which includes public and educational hospitals, are more likely to suffer from burnout than those who work in the private sector or both private and public sectors. This discrepancy may be explained by several differences between the public and private health systems in Iran. Public hospitals and clinics may be overcrowded due to their better facilities and affordability. Surgeons working in the public system have to deal with multiple traumas and perform more complicated surgeries, while their counterparts in private hospitals perform more elective and less challenging surgeries. Iran's public hospitals are often the first line of referral for multiple trauma patients. This in turn increases the medical team's stress and workload to the extent that the surgeons have to do more emergency operations and surgeries in the night shifts compared to their peers in the private sector. The socioeconomics of the patients seeking care in the public and private health system is different as well. A surgeon

who works in the public system receives a small fraction fee per case compared to a surgeon who works in the private system and usually earns less income.

Specialists in university hospitals, which are affiliated with the public health system in Iran, have the extra task of educating residents and students and performing research. This in itself can increase their workload and prolong the time of surgeries (26-29).

In a similar study conducted on burnout among doctors and nurses in Egyptian emergency hospitals, it was stated that higher job stress, inadequate salaries, and more exposure to critical and emergency patients are risk factors for burnout (30).

Sports, leisure activities, religion, and family support are among the noteworthy protective factors against burnout (20). The effectiveness of sport and leisure activities on occupational burnout was approved in the present study as well.

One of the strengths of the study is its particular focus on orthopedics. Physicians from different groups of the orthopedic community participated in the study; therefore, the sample size was statistically valid. Only 6% of the study participants were females, which was due to the low percentage of female orthopedists in Iran. The number of individuals who refused to cooperate and withdrew from the study was much less in the current study than those conducted using electronic questionnaires via e-mail. Regarding the limitations of the present study, one can refer to the fact that direct access to some physicians was impossible. In addition, such factors as economic, cultural, and political issues of society, as well as personal and family problems play role in the quality of work and occupational burnout. However, the use of MBI present in this study could not distinguish the effect of each. The participants' moods, depression, or happiness on the day they filled out the questionnaire can also have an impact on the outcomes; however, this issue was not investigated in this study.

Based on the obtained results, the frequency of burnout is high among orthopedic specialists, especially orthopedic residents in Iran. Factors associated with burnout include academic rank, age, working status, and the amount of time spent in leisure and sports activities. The results indicate the need for attention and interventions through undertaking nationwide preventive and therapeutic measures.

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