



# Occupational Burnout and Its Related Factors Among Medical Imaging Employees in Bandar Abbas Hospitals, Iran

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## Abstract

**Background:** Occupational burnout is a type of prolonged response and has been regarded to be associated with chronic job-related stress and decreased job performance.

**Objectives:** In this study, we aimed to determine the level of occupational burnout and its related factors among medical imaging workers across Bandar Abbas hospitals in Iran.

**Methods:** A questionnaire-based study was conducted among employees of medical imaging departments across Bandar Abbas hospitals, and the Maslach Burnout Inventory (MBI) was used to determine the level of burnout. A total of 150 complete responses were analyzed using independent samples *t*-test, one-way analysis of variance, and Pearson's correlation in SPSS version 20.

**Results:** Medical imaging employees had a moderate mean score for all the subscales of burnout, namely emotional exhaustion (EE) ( $20.7 \pm 9.57$ ), depersonalization (DP) ( $5.46 \pm 5$ ) and personal accomplishment (PA) ( $33.77 \pm 7.97$ ), compared to MBI norms. There were significant differences in each of the MBI subscales based on age, work experience, marital status and type of work environment. Also, the correlation between EE and DP scores and gender, DP and PA scores and academic degree and EE and PA scores and work load were significant ( $P < 0.05$ ). However, there was no significant interrelationship between DP and workload, PA and gender EE and academic degree.

**Conclusions:** Demographic and occupational variables can affect the level of burnout. Occupational burnout, on the other hand, may influence the quality of care. Therefore, modifying the work status and respecting the experience and expertise of radiographers can reduce occupational burnout among medical imaging employees.

**Keywords:** Professional Burnout, Radiographer, Medical Imaging Worker, Maslach Burnout Inventory

## 1. Background

Occupational burnout is a type of prolonged response occurring as a result of chronic job-related stress (1). The best tool for measuring burnout in the literature is the Maslach Burnout Inventory (MBI). According to Maslach, burnout syndrome (BOS) has three stages of emotional exhaustion (EE), depersonalization (DP) and accomplishment (PA). The final stage is associated with feelings of inadequacy, personal failure and poor professional self-esteem. These feelings may lead to depression, causing the person to leave his/her profession (1, 2).

All professionals may experience BOS, but certain occupations are at a distinct risk for the development of burnout such as health care professions (2). The ongoing interaction between health care workers and patients

with their associated psychological, physical and social problems can potentially expose these professionals to more stress than other occupations and are susceptible to burnout (3).

BOS often causes symptoms that negatively affect the quality of life of health care workers. Also, a significant relationship has been demonstrated between this syndrome and decreased job performance (3). Therefore, more investigations on the prevalence of occupational burnout among these professions are needed. Most studies have been conducted on the prevalence of burnout among physicians, nurses, oncologists and radiotherapy technicians (4-7). According to studies, radiation therapists, oncology nurses and oncologists present high levels of burnout in some dimensions (5, 8). Also, the results of other studies showed that several factors such as age, sex,

working hours per week, and work experience play a key role in the level of occupational burnout (4, 9).

To date, few studies have been conducted on occupational burnout among medical imaging professionals. In a study on Iranian radiology employees' quality of work life by Dargahi et al. (10) it was indicated that most employees are unsatisfied with their quality of work life factors. Also, Singh et al. demonstrated that burnout level among radiographers, sonographers and radiologists was high (11).

## 2. Objectives

Our study aimed to evaluate the level of occupational burnout among medical imaging professionals in Bandar Abbas hospitals, Iran. Also, in this study, the interrelationship between the level of burnout and various individual and job-related factors was assessed among a population of medical imaging employees.

## 3. Methods

### 3.1. Sample

A questionnaire-based study was used for gathering data across medical imaging departments to quantitatively assess the prevalence of occupational burnout. Questionnaires were handed out to all employees of medical imaging departments in Bandar Abbas hospitals. The exclusion criteria included suffering from any known psychological and physical diseases, using psychotropic drugs and experiencing any major events. A total of 150 (out of 165) complete responses were analyzed.

Given the present study had a questionnaire-based design, it did not require ethics code.

### 3.2. Instrumentation

The questionnaire consisted of two sections, the first section included items on demographic and occupational features of the subjects and in the second section, the MBI was used. The MBI is a 22-item questionnaire that measures the three subscales of burnout.

The MBI questionnaire was translated into Persian and its reliability was confirmed in Iran using alpha correlation coefficient (7, 12). The Cronbach's alpha coefficient of the Persian version of MBI in the studies of Sahebzadeh et al. and Amiri et al. were 0.86, 0.82 and 0.85, respectively (7, 12). In our study, the Cronbach's alpha coefficient for the three dimensions of burnout including emotional exhaustion, depersonalization and reduced personal accomplishment were 0.88, 0.79 and 0.76, respectively.

All the questions are scored on a 6-point Likert scale ranging from 0 (never) to 6 (every day). The item scores

in each subscale of burnout are summed up to obtain a final MBI score for each subscale separately. The scores of each section were categorized into low, medium and high levels. EE scores 27 or higher signify high EE, 19 - 26 indicate a medium level and scores 18 or lower specify low level of EE. DP scores of 5 or lower indicate low DP, scores 6 - 9 show medium DP and 10 or higher denote high level of DP. PA scores between 34 - 39 specify medium level of PA, and scores 33 or lower and 40 or higher are classified as the low and high levels of PA, respectively.

Occupational burnout using the MBI is characterized by high scores for emotional exhaustion and depersonalization (score of  $\geq 27$  and  $\geq 10$ , respectively) and low scores for personal accomplishment (score of  $\leq 33$ ) (1).

### 3.3. Statistical Analysis

All the data were analyzed using SPSS version 20. Independent samples *t*-test and one-way analysis of variance (ANOVA) were performed to examine the relationship between the demographic and occupational characteristics and the three MBI subscales. Also, the Pearson correlation coefficient was run for examining the association between age and MBI subscales. P value less than 0.05 was considered significant.

## 4. Results

### 4.1. Participant Characteristics

The sociodemographic and occupational characteristics of the participants are presented in Table 1.

### 4.2. Prevalence of Burnout

The prevalence of burnout among the radiographers according to the MBI is summarized in Table 2. In our study, EE and DP scores were lower than the MBI norms (1), but PA scores were all higher. In general, the mean scores of EE, DP, and PA subscales were  $20.7 \pm 9.57$ ,  $5.46 \pm 5$  and  $33.77 \pm 7.97$ , respectively.

Table 3 shows that 25% and 18% of the radiographers had high levels of EE and DP scores, respectively, while 45% of them had low levels of PA, indicating high levels of burnout.

### 4.3. Burnout According to Demographic Characteristics

The correlations between sociodemographic and occupational characteristics and the burnout subscales are presented in Table 4. In this study, demographic and occupational variables were identified to have a significant influence on the level of burnout subscales among radiographers.

**Table 1.** Demographic Characteristics of Medical Imaging Professionals<sup>a</sup>

Demographic Characteristics	Medical Imaging Workers
<b>Gender</b>	
Male	54 (36)
Female	96 (64)
<b>Age, y</b>	
20 - 29	77 (51.3)
30 - 39	52 (34.7)
≥ 40	21 (14)
<b>Marital status</b>	
Married	83 (55.3)
Single	67 (44.7)
<b>Academic degree</b>	
Associate's degree	58 (38.7)
Bachelor's degree and higher	92 (61.3)
<b>Work experience, y</b>	
≤ 10	99 (66)
> 10	51 (34)
<b>Work commitments</b>	
Full time	88 (58.7)
Part time	62 (41.3)
<b>Type of work environment</b>	
X-ray	91 (60.7)
Others	59 (39.3)

<sup>a</sup>Values are expressed as No. (%).

**Table 2.** Level of MBI Subscale Scores Among Medical Imaging Workers<sup>a</sup>

MBI Subscales	Medical Imaging Workers (N = 150)
Emotional exhaustion	20.7 ± 9.57
Depersonalization	5.46 ± 5
Personal accomplishment	33.77 ± 7.97

Abbreviation: MBI, Maslach Burnout Inventory.

<sup>a</sup>Values are expressed as mean ± SD.

Work experience and age had a significant negative correlation with EE and DP. Higher work experience and older age were significantly associated with low scores of EE and DP ( $P < 0.001$ ). However, the level of PA was significantly higher in the higher work experience group ( $P < 0.01$ ). Also, PA score was significantly lower in the 20 - 29 age group than the older age groups ( $P < 0.001$ ), indicating that younger radiographers in our study experienced high levels of burnout.

The prevalence rates of EE and DP among male and single radiographers were significantly higher than female

**Table 3.** The Number and Percentage of Medical Imaging Professionals with High, Moderate, and Low Burnout Scores for Emotional Exhaustion, Depersonalization, and Personal Achievement<sup>a</sup>

MBI Subscales Score	Medical Imaging Workers (N = 150)
<b>Emotional exhaustion</b>	
Low	73 (48.7)
Moderate	40 (26.7)
High	37 (24.7)
<b>Depersonalization</b>	
Low	78 (52)
Moderate	45 (30)
High	27 (18)
<b>Personal accomplishment</b>	
Low	68 (45.3)
Moderate	42 (28)
High	40 (26.7)

Abbreviation: MBI, Maslach Burnout Inventory.

<sup>a</sup>Values are expressed as No. (%).

and married ones ( $P < 0.05$ ). Additionally, the level of PA was significantly higher in the married group compared with the single group ( $P < 0.01$ ). However, no significant association was found between sex and PA score. The correlation between EE and academic degree was not statistically significant. Also, DP level was significantly higher in radiographers with bachelor's degree compared to those with associate's degree ( $P < 0.001$ ).

The EE and DP scores in medical imaging workers working in X-ray departments were higher than those working in other units ( $P < 0.01$ ). Moreover, the level of PA in X-ray departments was significantly lower than in other units ( $P < 0.001$ ).

Pearson correlation coefficients between age and EE, DP, and PA scores were -0.512, -0.452 and 0.38, respectively, and a statistically significant association was found between them ( $P < 0.001$ ). Thus, age had a significant negative correlation with EE and DP. Also, a positive relationship was found between PA and age.

## 5. Discussion

In this exploratory study, we evaluated the level of burnout in Bandar Abbas medical imaging departments. The mean scores of EE, DP and PA among the medical imaging workers were  $20.7 \pm 9.57$ ,  $5.46 \pm 5$  and  $33.77 \pm 7.97$ , respectively, which are moderate levels of EE, DP and PA compared to the reported MBI norms. Singh et al. showed that the scores of EE, DP and PA in radiographers were 39.9, 18.9 and 30.8, respectively, indicating a high level of burnout in

**Table 4.** Correlation Between Sociodemographic and Occupational Characteristics and the Burnout Subscales

Variables	Emotional Exhaustion		Depersonalization		Personal Accomplishment	
	Mean $\pm$ SD	P Value	Mean $\pm$ SD	P Value	Mean $\pm$ SD	P Value
<b>Gender</b>		0.035		0.000		0.39
Male	22.88 $\pm$ 9.7		8.35 $\pm$ 5.2		32.98 $\pm$ 8.2	
Female	19.46 $\pm$ 9.3		3.94 $\pm$ 4.1		34.14 $\pm$ 7.8	
<b>Age, y</b>		0.000		0.000		0.000
20 - 29	25.37 $\pm$ 8.6		7.68 $\pm$ 5.3		30.94 $\pm$ 7.1	
30 - 39	16.96 $\pm$ 8.4		3.82 $\pm$ 3.3		35.7 $\pm$ 7.6	
$\geq$ 40	12.8 $\pm$ 5.3		1.85 $\pm$ 3.02		38.95 $\pm$ 7.7	
<b>Marital status</b>		0.007		0.000		0.005
Single	23.02 $\pm$ 9.2		7.92 $\pm$ 5.4		31.7 $\pm$ 7.08	
Married	18.81 $\pm$ 9.4		3.6 $\pm$ 3.6		35.34 $\pm$ 8.2	
<b>Academic's degree</b>		0.21		0.001		0.006
Associate's degree	19.48 $\pm$ 10.1		3.81 $\pm$ 3.8		35.96 $\pm$ 7.5	
Bachelor degree and higher	21.46 $\pm$ 9.2		6.61 $\pm$ 5.3		32.31 $\pm$ 7.8	
<b>Work experience, y</b>		0.000		0.000		0.002
$\leq$ 10	23.63 $\pm$ 8.7		6.95 $\pm$ 5.3		32.32 $\pm$ 7.3	
> 10	15 $\pm$ 8.4		2.7 $\pm$ 2.8		36.45 $\pm$ 8.4	
<b>Work commitments</b>		0.007		0.18		0.003
Full time	22.44 $\pm$ 10.2		5.98 $\pm$ 4.9		32.13 $\pm$ 7.8	
Part time	18.22 $\pm$ 7.9		4.88 $\pm$ 5.03		35.98 $\pm$ 7.6	
<b>Type of work environment</b>		0.007		0.000		0.000
X-ray	22.39 $\pm$ 9.5		6.75 $\pm$ 5.3		30.13 $\pm$ 6.9	
Others	18.08 $\pm$ 9.1		3.6 $\pm$ 3.7		39.27 $\pm$ 6.05	

radiographers (11). In our study, the level of burnout was lower than those reported for radiographers in Australia and New Zealand (11) and for oncology employees in New Zealand and the USA (3, 5). However, our findings are in line with the reports for oncology care workers in other countries (13). Comparison of the results indicates that the level of burnout varies extensively across different professions. This can be due to many factors such as the existing policies, occupational variables and working condition.

Demographic and occupational variables are also considered as contributing factors to burnout. Increased work experience and age in medical imaging workers were significantly correlated with MBI subscale scores (inverse correlation with EE and DP and positive correlation with PA). In the same vein, several studies showed that younger employees or those with lower work experience experienced a higher level of burnout in Iran and other countries (4, 7, 14, 15). These results demonstrate that the initial years of the profession may be the most challenging years. The possible reason behind this issue lies in the fact that older

employees experience various situations in the workplace over time and they may gradually learn how to handle unpleasant situations. Therefore, these individuals may experience less job burnout. Our results are not in agreement with those of Finnish et al., who found that higher age is not associated with lower burnout and older workers might avoid patients (16). Also, Singh et al. showed that age and work experience did not influence burnout level among radiographers (11).

There have been controversial results with regard to the impact of gender on MBI subscales. Some studies found that the level of burnout in females is higher than in males (15, 17), while others reported gender was not a significant factor for burnout level (14, 18, 19). In our study, male radiographers had significantly higher EE and DP scores than females. This finding is in line with other reports (3, 20, 21). These results are probably due to hours spent in the workplace, as females are more likely to work part-time and are less prone to exhibiting signs of burnout.

It has been observed that single medical imaging em-

ployees show higher levels of EE and DP and lower levels of PA than married workers, indicating higher levels of burnout. Demirci et al. reported that married participants were less likely to experience burnout (4). Also, our finding confirms the results of other studies (14, 22, 23). However, Amiri et al. and Poghosyan et al. reported no significant relationship between marital status and the incidence of burnout (7, 24). The increased incidence of burnout in single employees can be due to their lower age and lower work experience. As mentioned earlier, these represent higher levels of job burnout.

Aziz Nezhad et al. (25) showed a significant relationship between excessive working hours and higher levels of burnout. In our study, the level of EE in full-time workers was higher than part-time workers. Also, the rate of PA in full-time work was lower than part-time, but there was no significant correlation between DP score and workload.

Interestingly, our analysis demonstrated that medical imaging employees working in X-ray departments reported significantly higher job burnout than other groups. Additionally, Demirci et al. found that the levels of EE and DP in medical oncology employees were higher than those of the workers in other departments (4). Perhaps worrying about the harmful effects of ionizing radiation contributes to the increased level of burnout in employees who work in X-ray departments.

In this study, radiographers with higher educational degrees experienced a higher level of DP and lower level of PA, which is inconsistent with the results of Delpasand et al. (26). They reported a higher rate of burnout in nurses who had lower educational levels. In the present study, the increased incidence of burnout in employees with higher educational levels can be due to increased awareness about the harmful effects of ionizing radiation.

### 5.1. Conclusions

In sum, the mean levels of EE, DP and PA were relatively moderate among Bandar Abbas radiographers working in medical imaging departments, and the majority of radiographers were experiencing low levels of PA. The demographic and occupational variables were considered as a contributing factors to burnout, and occupational burnout may influence the quality of care. Thus, making changes to the work environment and respecting the experience and expertise of radiographers can lower occupational burnout among radiographers.

### Supplementary Material

Supplementary material(s) is available [here](#) [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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### Footnotes

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