

# Burnout Among Saudi Radiographers

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**Introduction:** Burnout research is limited in Saudi Arabia, particularly among radiographers. Burnout among Saudi radiographers may have a negative impact on the services offered.

**Objective:** This study aims to assess the burnout among radiographers in Medina hospitals.

**Materials and Methods:** This quantitative cross-sectional study included 104 radiographers from government and private Medina hospitals. The Maslach Burnout Inventory-Human Services Survey for Medical Personnel, which consists of 22 questions, was used to measure the burnout level. The data were evaluated descriptively using the Statistical Package for the Social Sciences (version 25), and independent *t*-tests and analysis of variance were applied to assess group differences and linear regression analysis to evaluate associations between the burnout level and sociodemographic variables (ie sex, age, experience, and department).

**Results:** The emotional exhaustion (EE) and depersonalization (DP) scores were moderate, while the personal accomplishment (PA) score was high, with total scores of 23.53 (9.32), 7.29 (5.95), and 29.70 (1.35), respectively. The DP score was influenced by the participants' experience. Specifically, an experience of 1–5 years yielded a substantially higher burnout score than did an experience of >10 years ( $p > 0.05$ ). Conversely, sex, age, and department did not affect the DP score ( $p < 0.05$ ). Similarly, the EE and PA scores were not influenced by sex, age, experience, or department ( $p < 0.05$ ).

**Conclusion:** Burnout is prevalent among radiographers in Medina hospitals in Saudi Arabia. The EE and DP scores are moderate, while the PA score is high, indicating a suitable work environment. Policymakers should take the required steps to identify the variables contributing to employee burnout and enhance the work environment.

**Keywords:** burnout, radiographers, emotional exhaustion, EE, depersonalization, DP, personal accomplishment, PA

## Introduction

Burnout is a psychological syndrome marked by emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA). It is a significant issue among healthcare professionals, particularly radiographers. Burnout syndrome is characterized by persistent workplace stress that has not been effectively managed. It is caused by ongoing emotional stress at work and is characterized by emotional stress, greater DP, and a decreased sense of personal success. Job satisfaction and performance, susceptibility to sickness, and interpersonal connections are all impacted by burnout. Systematic information on the prevalence of burnout among healthcare professionals working in various healthcare sectors in Middle Eastern nations is lacking.<sup>1–3</sup> Approximately one in three medical doctors is burnt out; this could affect one's health and the standard of care.<sup>4</sup> The issue of burnout has grown to be significant and challenging for public health. Unfortunately, the illness is poorly understood, and the diagnosis is not often accepted.<sup>5</sup> Fatigue-altered pain perception, poor cardiovascular health, depression, and musculoskeletal discomfort are all potential outcomes of burnout that have negative physical and psychological implications.

The combined prevalence of total burnout among regional physicians is 24.5%. Among the sub-components of burnout, a high pooled prevalence of 44.26% has been estimated for EE, 37.83% for DP, and 36.57% for low PA.<sup>6</sup> Healthcare organizations are significantly impacted by the presence of burnout among health professionals owing to increased absenteeism and error probability, frequent work delay, low productivity, job dissatisfaction, conflict between and within professions, high job turnover and quitting rates, and reduction in the quality of care perceived by users.<sup>2,7</sup> Chou et al found that nurses had the highest rate of work-related burnout (66%), followed by physician assistants (61.8%), medical doctors (38.6%), support workers (36.1%), and medical technicians (31.9%). According to the hierarchical regression analysis, the highest variance (32.6%) in burnout was explained by job stress, overcommitment, and a lack of social support.<sup>8</sup>

Burnout among healthcare workers can be caused by a variety of factors, including gender, stage of life, work-life relationships, age, and workplace environment.<sup>9–11</sup> Research indicates a strong association between burnout and working conditions.<sup>12–14</sup> Individuals who prioritize serving others, set high standards, and cope with their difficulties are more likely to experience burnout.<sup>15</sup> Research indicates a strong link between burnout and public perception.<sup>16</sup> Radiographers with several responsibilities to patients, co-workers, referring physicians, and radiologists face chronic stress and occupational burnout.<sup>17,18</sup> Radiographers are more likely to experience burnout because to their increased workload and limited resources.<sup>17</sup>

Recent reviews have recommended the need for studies assessing the burnout level among a variety of healthcare providers, including laboratory scientists and radiographers.<sup>18,19</sup> A recent study found moderate to high burnout rates among Saudi radiological sciences students. It reported that academic counselling can help students cope with emotional stress and decrease the risk of burnout.<sup>12</sup> The growth of burnout among radiographers as public healthcare providers in Medina hospitals as well as the likely involvement of sex and other aspects has been noted. Workplace issues such as increased workload and stress related to delivering safe, high-quality patient care can contribute to burnout. Therefore, it is essential to study this issue. Most burnout research among health professionals has focused on physicians and nurses, with relatively limited work conducted on allied health workers such as radiographers. The main aim of this study is to assess burnout among radiographers working in Medina hospitals. To the best of our knowledge, this study is the second study to explore burnout among radiographers in Saudi Arabia.

## Materials and Methods

### Study Design and Participants and Sample Size

This quantitative cross-sectional study focused on radiographers working in Medina hospitals. A survey was administered online via Google Forms and distributed to participants via Email and WhatsApp. The study was conducted from 31 January to 8 March 2022. Weekly reminders were provided. The inclusion criteria were voluntary participation, employment in medical imaging departments for at least a year, and provision of written informed consent. The exclusion criteria were incompleteness of the questionnaire and employment in medical imaging departments for less than a year.

A systematic basic method of random sampling was used. The sample size was calculated using a sample size calculator on an infinite population with a degree of precision of 5% and a confidence interval of 95%, yielding 104 participants.<sup>20</sup> A total of 104 out of 140 radiographers responded to the online questionnaire, yielding a 74.3% response rate. Complete responses from the 104 radiographers were included in the data analysis.

### Independent Variables

The sociodemographic variables included (1) sex (female vs male); (2) age (21–25 years vs 26–35 years vs >36 years); (3) experience (1–5 years vs 6–10 years vs >10 years); and (4) department (radiography vs computed tomography vs magnetic resonance imaging vs nuclear medicine [NM] vs ultrasound).

### Dependent Variables

The dependent variables were EE, DP, and PA.

## Maslach Burnout Inventory-Human Services Survey for Medical Personnel (MBI-HSS-MP)

In 1981, Christina Maslach and Susan E. Jackson created the initial form of the MBI to assess an individual's experience of burnout. In a recent study, the construct validity of the MBI was tested using multi-trait scaling analysis and confirmatory factor analysis (CFA), while reliability was assessed using internal consistency and test-retest reliability at a two-week interval. The MBI has high psychometric qualities and can reliably detect burnout.<sup>21</sup> The Maslach Burnout Inventory (MBI) consists of 22 questions separated into three domains about professionals' feelings and interactions with patients/recipients of services. Each question has seven alternative answers, rated on a Likert scale from 0 to 6, with 0 and 6 indicating that certain situations "never" happened and happened "every day", respectively. The MBI-HSS-MP contains three subscales: (1) EE, which measures feelings of being emotionally overextended and exhausted by one's work; (2) DP, which measures an unfeeling and impersonal response towards recipients of one's service, care, treatment, or instruction; and (3) PA, which measures feelings of competence and achievement in one's work. An increase in the mean EE and DP scores implies higher burnout levels. However, a lower average PA score is linked to higher burnout levels. According to the final score and cut-off values shown in Table 1, each dimension is classed as either high, moderate, or low.<sup>7,22</sup>

## Statistical Analysis

The Statistical Package for the Social Sciences version 23.0 for Windows (IBM) was used to analyze the data. The frequency and percentage of the responses to each question were analyzed individually, considering all 104 radiographers who completed the survey. We used Microsoft Excel 2016 for Windows to obtain the Likert scale scores when analyzing the data. Independent *t*-tests and analysis of variance were used to assess group differences, and linear regression analysis was performed to test the relationship between burnout and sex, age, and experience. P-values of <0.05 were considered significant.

## Results

### Participant Demographics

One hundred four radiographers from public and private Medina hospitals participated in the survey. Of them, 39 (37.5%) were women, while 65 (62.5%) were men. Approximately 27%, 39%, and 38% were aged 21–25, 26–35, and >36 years, respectively. Moreover, 42.3% and 36.5% had an experience of 1–5 years and >10 years working in medical imaging departments, respectively (Table 2). For each MBI-HSS-MP subscale, the burnout levels were calculated. The average

**Table 1** MBI Domains and Subscale Cut-off Scores and Categories<sup>7,13</sup>

| Subscale         | Number of Items | Ordinal Number Of Questions   | Category | Cut-off Score |
|------------------|-----------------|-------------------------------|----------|---------------|
| EE (score: 0–54) | 9               | 1, 2, 3, 6, 8, 13, 14, 16, 20 | High     | ≥27           |
|                  |                 |                               | Moderate | 19–26         |
|                  |                 |                               | Low      | 0–18          |
| DP (score: 0–30) | 5               | 5, 10, 11, 15, 22             | High     | ≥10           |
|                  |                 |                               | Moderate | 6–9           |
|                  |                 |                               | Low      | 0–5           |
| PA (score: 0–48) | 8               | 4, 7, 9, 12, 17, 18, 19, 21   | High     | 0–33          |
|                  |                 |                               | Moderate | 34–39         |
|                  |                 |                               | Low      | ≥40           |

**Abbreviation:** MBI, Maslach Burnout Inventory; EE, emotional exhaustion; DP, depersonalization; PA, personal accomplishment.

**Table 2** Sociodemographic Characteristics of the Study Sample

| Variable          | Frequency | Percentage |
|-------------------|-----------|------------|
| <b>Sex</b>        |           |            |
| Male              | 65        | 62.5       |
| Female            | 39        | 37.5       |
| <b>Age</b>        |           |            |
| 21–25 years       | 27        | 26.0       |
| 26–35 years       | 39        | 37.5       |
| >36 years         | 38        | 36.5       |
| <b>Department</b> |           |            |
| Radiography       | 42        | 40.4       |
| CT                | 26        | 25.0       |
| MRI               | 10        | 9.6        |
| Nuclear medicine  | 9         | 8.7        |
| Ultrasound        | 17        | 16.3       |
| <b>Experience</b> |           |            |
| 1–5 years         | 44        | 42.3       |
| 6–10 years        | 22        | 21.2       |
| >10 years         | 38        | 36.5       |

**Abbreviation:** CT, computed tomography; MRI, magnetic resonance imaging.

EE score was 23.53 (9.32), while the median EE score was 22. The average DP score was 7.23 (5.95), while the median DP score was 6. The average PA score was 29.7 (1.35), while the median PA score was 31 (Table 3).

Table 4 shows the relationship between the burnout score and sex, age, experience, and department. There was a significant difference in the mean DP score ( $p < 0.05$ ) among the radiographers according to work experience. The participants with 1–5 years of experience showed a significantly higher mean DP score (8.98) than did those with >10 years of experience (5.74) ( $p = 0.036$ ). Conversely, there was no significant difference in the DP score according to sex or age. Similarly, there was no significant difference in the EE and PA scores according to sex, age, experience, or department. The linear regression model indicated that the years of experience significantly influenced the DP score, regardless of sex or age. Conversely, no variables influenced the EE and PA scores (Table 5).

**Table 3** Overall Score of the Burnout Domains

| Item                    | Overall Mean $\pm$ SD Score | Overall Median Score |
|-------------------------|-----------------------------|----------------------|
| Emotional exhaustion    | 23.53 $\pm$ 9.32            | 22                   |
| Depersonalization       | 7.29 $\pm$ 5.95             | 6                    |
| Personal accomplishment | 29.70 $\pm$ 1.35            | 31                   |

**Table 4** Impact of Sex, Age, and Experience on Burnout

| Variable                | Emotional Exhaustion,<br>Median/Mean $\pm$ SD Score | Depersonalization,<br>Median/Mean $\pm$ SD Score | Personal Accomplishment,<br>Median/Mean $\pm$ SD Score |
|-------------------------|---|--|--|
| <b>Sex</b>              |   |  |  |
| Male                    | 22  | 7.32 $\pm$ 6.07                                  | 29.69 $\pm$ 11.25                                      |
| Female                  | 24  | 7.23 $\pm$ 5.82                                  | 29.72 $\pm$ 8.78                                       |
| P-value                 | 0.231   | 0.939  | 0.99   |
| <b>Age</b>              |   |  |  |
| 21–25 years             | 23.11 $\pm$ 9.04                                    | 7.96 $\pm$ 5.67                                  | 29.04 $\pm$ 9.94                                       |
| 26–35 years             | 25.08 $\pm$ 9.059                                   | 7.92 $\pm$ 6.16                                  | 29.72 $\pm$ 8.69                                       |
| >36 years               | 22.24 $\pm$ 9.79                                    | 6.16 $\pm$ 5.91                                  | 30.16 $\pm$ 12.26                                      |
| P-value                 | 0.398   | 0.222  | 0.913  |
| <b>Experience</b>       |   |  |  |
| 1–5 years               | 24.36 $\pm$ 9.07                                    | 8.98 $\pm$ 6.26*                                 | 28.82 $\pm$ 9.91                                       |
| 6–10 years              | 24.41 $\pm$ 8.96                                    | 6.59 $\pm$ 5.00                                  | 32.73 $\pm$ 6.69                                       |
| >10 years               | 22.05 $\pm$ 9.86                                    | 5.74 $\pm$ 5.71                                  | 28.97 $\pm$ 12.31                                      |
| P-value                 | 0.476   | 0.036*   | 0.306  |
| <b>Department</b>       |   |  |  |
| Radiography             | 24.21 $\pm$ 9.94                                    | 7.62 $\pm$ 6.22                                  | 29.76 $\pm$ 10.63                                      |
| CT                      | 23.50 $\pm$ 8.46                                    | 9.00 $\pm$ 6.32                                  | 30.08 $\pm$ 9.43                                       |
| MRI                     | 28.70 $\pm$ 8.78                                    | 6.50 $\pm$ 6.09                                  | 26.60 $\pm$ 8.92                                       |
| NM                      | 19.33 $\pm$ 6.52                                    | 3.44 $\pm$ 1.94                                  | 29.22 $\pm$ 11.49                                      |
| Ultrasound              | 21.06 $\pm$ 9.77                                    | 6.35 $\pm$ 5.37                                  | 31.06 $\pm$ 11.89                                      |
| <b>Total mean score</b> | 23.53 $\pm$ 9.32                                    | 7.29 $\pm$ 5.95                                  | 29.70 $\pm$ 10.35                                      |
| P-value                 | 0.175   | 0.155  | 0.875  |

Note: \*significant at <0.05.

Abbreviations: CT, computed tomography; MRI, magnetic resonance imaging; NM, nuclear medicine.

**Table 5** Linear Regression Analysis of the Prevalence of Burnout According to Age, Sex, and Experience

| Variable                    | Unstandardized b | Standardized Coefficient Error | Standardized Coefficient Beta | 95% Confidence Interval | p-value |
|-----------------------------|------------------|--------------------------------|-------------------------------|-------------------------|---------|
| <b>Emotional exhaustion</b> |                  |                                |                               |                         |         |
| <b>Sex</b>                  | 2.100            | 1.905                          | 0.110                         | –1.679 to 5.879         | 0.273   |
| <b>Age</b>                  | 1.750            | 2.150                          | 0.148                         | –2.517 to 6.016         | 0.418   |
| <b>Experience</b>           | –2.288           | 1.901                          | –0.219                        | –6.060 to 1.483         | 0.232   |

(Continued)

**Table 5** (Continued).

| Variable                       | Unstandardized b | Standardized Coefficient Error | Standardized Coefficient Beta | 95% Confidence Interval | p-value |
|--------------------------------|------------------|--------------------------------|-------------------------------|-------------------------|---------|
| <b>Depersonalization</b>       |                  |                                |                               |                         |         |
| Sex                            | -0.414           | 1.182                          | -0.034                        | -2.760 to 1.931         | 0.727   |
| Age                            | 1.990            | 1.335                          | 0.263                         | -0.658 to 4.638         | 0.139   |
| Experience                     | -3.139           | 1.180                          | -0.470                        | -5.480 to -0.798        | 0.009*  |
| <b>Personal accomplishment</b> |                  |                                |                               |                         |         |
| Sex                            | 0.110            | 2.143                          | 0.005                         | -4.140 to 4.361         | 0.959   |
| Age                            | 1.438            | 2.419                          | 0.109                         | -3.360 to 6.236         | 0.554   |
| Experience                     | -0.923           | 2.138                          | -0.079                        | -5.165 to 3.319         | 0.667   |

Note: \*significant at < 0.05.

## Discussion

This study aimed to assess the prevalence of burnout syndrome among radiographers in Medina hospitals. Most previous studies have focused on burnout among physicians and nurses, with only few studies concerning radiographers. The present study found that the overall mean EE and DP scores among the radiographers were moderate, while the overall mean PA score was high.

The EE score was moderate among the radiographers in this study. A prior study conducted in Saudi Arabia among 142 radiographers reported that 67% of participants were at a moderate-to-high risk of having burnout due to EE.<sup>23</sup> In contrast, a study performed in Australia and New Zealand found that most of 613 radiographers had high levels of EE.<sup>23</sup> EE is considered the central aspect and the leading risk factor of burnout and can indicate the early stage of the condition.<sup>21</sup> EE can also cause lower physical and psychological energy levels and more mental health problems.<sup>22</sup> The present study revealed that the EE score did not significantly differ according to the sex, age, experience, and department of the radiographers. An extreme weariness of emotions can lead to decreased productivity and adaptability and loss of interest in one’s community and family. The fact that a significant number of health professionals report feeling emotionally exhausted is concerning since, if left untreated, this condition can lead to more severe mental and physical problems over time.<sup>24</sup> Overall, radiographers have a moderate level of EE, indicating that efforts should be made to address the factors contributing to burnout and establish a supportive and healthy work environment for radiographers. Workload management, stress reduction, coping strategy training, and positive colleague relationship establishment may be considered.

In the present study, the DP score was moderate among the radiographers. Similarly, Alyousef studied burnout among Saudi radiographers and found that the DP score was 8.12, which was moderate.<sup>23</sup> In contrast, Alakhras and Al-Mousa reported a high DP score (11.2).<sup>25</sup> In our study, the DP score was influenced by the experience of the participants, and those who had 1–5 years of experience showed significantly higher burnout scores than did those who had >10 years of experience (p>0.05). Conversely, age and sex had no significant impact on the DP score. Most previous studies that reported a significant association between sex and burnout concluded that female sex was a significant predictor of a higher risk of DP.<sup>26–28</sup> It was found that the DP score was low in individuals who worked in NM departments; this lower score is attributed to the small number of patients attending such departments. Conversely, the DP score was moderate in individuals who worked in other departments. The MBI score reflected negative perceptions: While the risk of DP was low, that of emotional weariness and a diminished sense of professional performance was moderate and high, respectively. Overall, radiographers have a moderate level of DP, indicating that efforts should be made to address the issues contributing to burnout and provide a supportive and healthy work environment for radiographers. These efforts

may include strengthening communication and teamwork, offering patient-centred care training, and developing a workplace culture of understanding and compassion.

PA may prevent burnout from progressing to DP. The current study indicated that the radiographers experienced a high level of burnout in terms of PA based on the sum of the scores of the nine questions (29.70). In contrast, the overall PA scores in the study by Alakhras and Al-Mousa, which included 308 radiographers,<sup>25</sup> and the study by Alyousef, which included 150 participants,<sup>23</sup> were 35.8 and 35.63, respectively, indicating a moderate PA level. In comparison, an analysis of 19 studies involving 4108 healthcare professionals (women: 49.3%) conducted in Bahrain, Egypt, Jordan, Lebanon, Palestine, Saudi Arabia, and Yemen showed that there was a wide range of prevalence estimates in the MBI subscales, which revealed a low PA level (13.3).<sup>19</sup> Similar to the overall EE domain, there were no significant differences in PA according to sex, age, experience, or department ( $p < 0.05$ ). Many studies have found that younger age strongly predicted burnout. For example, the study by Al-Sareai et al among 270 Saudi physicians found that younger age was substantially associated with lower PA scores.<sup>28</sup> Further, most studies that reported a significant relationship between sex and burnout concluded that female sex was a strong predictor of a higher risk of burnout.<sup>26,27,29</sup> Taken together, assisting radiographers in dealing with a heavy workload and communication challenges necessitates a multidimensional approach that tackles human and organizational variables. Radiology departments may assist in fostering a supportive and healthy work environment for radiographers to reduce the risk of burnout.

The present study has some limitations, including the minimal number of respondents. It was expected that only some participants would respond. Furthermore, the influence of burnout on the performance of medical imaging departments, the areas where burnout can be reduced, and the degree of achievement raised were not evaluated; these aspects must be investigated in further research.

## Conclusions

In this study, the radiographers had moderate EE and DP levels and a high PA level. Work experience was found to be related to DP. Our findings highlight the importance of improving the work environment and managing the workload of radiographers to reduce work-related stress as well as routinely monitoring the burnout domains to identify high-risk areas and address the causes of burnout.

## Abbreviations

ANOVA, analysis of variance; EE, Emotional Exhaustion; DP, depersonalization; PA, personal accomplishment; SPSS, statistical package for social sciences; MBI, Maslach Burnout Inventory; HCP, high conflict personality.

## Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

## Ethics Approval and Consent to Participate

This study was approved by the Scientific Research Ethics Committee, College of Applied Medical Sciences, Taibah University (No. 2021/123/310/DRD). Informed consent was obtained from each participant. All methods were performed in accordance with the ethical standards of the institutional and national research committees and with the Helsinki Declaration (as revised in 2013).

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## Disclosure

The authors declared no conflicts of interest.



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