Burnout and depression among medical interns and its impact on productivity

Sulhi Alfakeh¹*, Afnan Noorsaeed², Yumna Kamal², Raghad Alafi², Ghaida Daghistani², Sara Alansari²

ABSTRACT
Background: The stressors and long hour internships could place a high burden on trainees, resulting in medical errors due to stress or fatigue. Thus, this study aimed to evaluate the prevalence of burnout and depression among medical interns at the King Abdulaziz University, and to determine the association between burnout and the number of medical errors committed.

Methods: A cross-sectional survey study was conducted on medical interns from King Abdulaziz University Hospital, Jeddah, Saudi Arabia during the year of 2021. An online self-administered questionnaire was used composed of the following validated questionnaires: the Depression, Anxiety, and Stress Scale (DASS) Version 21 and the Maslach Burnout Inventory.

Results: Majority of the participants (65.4%) were aged between 18 and 24 years, predominant were females (56.4%), 94.4% were single, and 91% lived with parents/guardians/relatives. Medical errors during internships were reported by 22.9% interns. Furthermore, 12.8% and 6.7% interns had mild and moderate depression, respectively. Most of them (19.6%) had moderate levels of anxiety and mild (6.1%) levels of stress; and 38% participants had burnout. The correlation between depression and anxiety levels and committing medical errors was non-significant \((p > 0.05)\). In contrast, stress and burnout were significantly correlated with an increase in committing medical errors \((p < 0.05)\). The Maslach Burnout Inventory scores and total DASS scores showed a significant positive correlation \((r = 0.45, p\text{-value} = <0.001)\).

Conclusion: Physician burnout could lead to inattentive behavior, medical errors, and lead to malpractice, all of which reduce patient satisfaction and affect treatment quality and disease outcomes. Thus, burnout is a major concern among interns.

Keywords: Depression, burnout, medical interns, impact; productivity.

Introduction
One of the most in-demand occupations is from the field of healthcare [1]. They work for long hours, make difficult decisions, and possibly make sacrifices in their personal lives [2]. Such an emotionally and physically demanding job might have serious negative consequences for their mental health, leading to higher rates of burnout [3].

According to the International Classification of Diseases-11 authority, burnout is considered as an occupational phenomenon as opposed to a medical condition [4]. Nevertheless, it is distinguished by the presence of three primary requirements: emotional exhaustion, depersonalization, and a diminished sense of accomplishment, particularly in jobs that require a high level of interpersonal interaction [4]. Chronic burnout predisposes the physician to a variety of mental illnesses, including depression, anxiety, feelings of lethargy, and fatigue, among others. This results in low productivity and job performance, which could have a significant impact on physician wellness and patient outcomes [5].

Previous research has found that professionals have the highest rate of burnout (54.3%), medical students...
have a rate of 45% [6-8], and medical interns have a rate of 10%-35% [9,10]. According to one study, interns are especially vulnerable to burnout because they were in a new work environment and lacked sufficient experience [11].

Medical internships are important training experiences in which medical interns gain hands-on opportunities to gain high level knowledge and skills within major specializations in a hospital setting, which is a requirement of licensing for medical doctors. These stresses and long hours associated with internships could place a high burden on trainees, resulting in medical errors due to stress or fatigue. Interns are in a weak position as trainees and often fail to express their needs [12].

This could impact on their mental health and well-being and is likely to reduce their ability to provide high quality care to their patients. As a result, they might develop burnout leading to medical errors, malpractice, and a decrease in work concentration [13,14]. Studies have shown that increased work stress could lead to more medical errors, and it has been established that the less stressed the health professionals, the fewer the complications would be [15]. As stated in a study conducted in the United States, preventable mistakes have been the cause of death for approximately 10,000 people [16]. Dealing with human life, on the other hand, leaves little room for error [17].

Although there is extensive literature on burnout, depression, and its relation to medical error among healthcare workers. However, the research in Saudi Arabia linking these variables is lacking. Thus, this study aimed to evaluate the prevalence of burnout and depression among medical interns at the King Abdulaziz University, and to determine the association between burnout and the number of medical errors committed.

**Subjects and Methods**

A cross-sectional survey study was designed and enrolled medical interns from King Abdulaziz University Hospital, Jeddah, Saudi Arabia during the year of 2021. The calculated sample size for this study was 191 participants based on a 95% confidence interval and error margin of 5% using the Raosoft sample size calculator [18]. Medical interns at King Abdulaziz University Hospital during the year 2021 were included in the study. Any forms submitted with missing data were excluded.

An online self-administered questionnaire was used in this study that consisted of three sections composed of the following validated questionnaires: the Depression, Anxiety, and Stress Scale (DASS) Version 21 [19] and the Maslach Burnout Inventory [20].

Section 1 consisted of the DASS [19] to assess affective disorder status. This scale assesses severity using the normal, mild, moderate, severe, or extremely severe classification based on the collective scores within each subscale category. Interpretation of the scale was based on the cut-off scores of Lovibond and Lovibond [19]. Section 2 included the Maslach Burnout Inventory [20]. This is a 22-item assessment scale used to assess burnout among healthcare professionals at all levels. It includes nine items on emotional exhaustion, five items on depersonalization, and eight items on personal accomplishment. Items were recorded on a scale of

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>117 (65.4%)</td>
</tr>
<tr>
<td>25-30</td>
<td>62 (34.6%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>78 (43.6%)</td>
</tr>
<tr>
<td>Female</td>
<td>101 (56.4%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>169 (94.4%)</td>
</tr>
<tr>
<td>Married</td>
<td>10 (5.6%)</td>
</tr>
<tr>
<td>Living situation</td>
<td></td>
</tr>
<tr>
<td>Living alone</td>
<td>9 (5%)</td>
</tr>
<tr>
<td>Living with non-student roommates</td>
<td>2 (1.1%)</td>
</tr>
<tr>
<td>Living with parents/guardians/relatives</td>
<td>163 (91.1%)</td>
</tr>
<tr>
<td>Living with spouse</td>
<td>5 (2.8%)</td>
</tr>
<tr>
<td>Have you committed any medical errors during your internship? (E.g., medical errors may be subjective or recognized by the attending or resident, they do not need to have caused harm to a patient):</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>138 (77.1%)</td>
</tr>
<tr>
<td>Yes</td>
<td>41 (22.9%)</td>
</tr>
<tr>
<td>Type of medical errors (No.:41)</td>
<td></td>
</tr>
<tr>
<td>Errors in medication</td>
<td>16 (39%)</td>
</tr>
<tr>
<td>Errors in investigation (lab work)</td>
<td>7 (17%)</td>
</tr>
<tr>
<td>Errors in data entry (computational errors)</td>
<td>4 (19.6%)</td>
</tr>
<tr>
<td>Wrong patient identification</td>
<td>10 (24.4%)</td>
</tr>
<tr>
<td>Errors in diagnosis</td>
<td>4 (19.6%)</td>
</tr>
</tbody>
</table>

Table 1. Distribution of studied participants according to their demographic and academic data, preferred specialty, and committing medical errors (N = 179).
Burnout and depression

0-6 (0 = never; 1 = a few times per year 2 = one time a month 3 = a few times per month 4 = one time a week 5 = a few times per week and 6 = every day). Burnout was diagnosed when final scores were ≥27 for emotional exhaustion, ≥13 for depersonalization or ≥37 for personal accomplishment. Furthermore, section 3 included a single question that assessed medical interns’ self-reported medical errors.

Statistical analyses were performed using Statistical Packages for the Social Sciences (version 26). The relationship between variables was tested using the Chi-square test ($\chi^2$) and correlations were performed using the Spearman’s test. Results were established as significant when p-values of ≤0.05 were obtained. All quantitative data were tabulated, and quantitative values were provided as numbers and/or percentages.

**Results**

Majority of the participants (65.4%) were aged between 18 and 24 years and were predominantly female (56.4%). Of the participants surveyed, 94.4% were single, and around 91% lived with parents/guardians/relatives. Medical errors during internships were reported by 22.9% interns surveyed. Among those who committed medical errors, the most common errors were in medication (39%) followed by wrong patient identification (24.4%) (Table 1).

Furthermore, 12.8% and 6.7% interns had mild and moderate depression, respectively. However, none of the participants had severe or extremely severe depression. Of the participants, mostly (19.6%) had moderate levels of anxiety and mild (6.1%) levels of stress. The current study also found that 38% participants had burnout (Figure 1).

The correlation between depression and anxiety levels and committing medical errors was non-significant ($p = >0.05$). In contrast, stress and burnout were significantly correlated with an increase in committing medical errors ($p = <0.05$) (Table 2).

The Maslach Burnout Inventory scores and total DASS scores showed a significant positive correlation ($r = 0.45$, $p$-value = <0.001). Similarly, significant positive correlations between the emotional exhaustion, depersonalization, and personal accomplishment components of the Maslach Burnout Inventory and all the depression, anxiety, and stress components of the DASS scale ($p = <0.05$) were observed (Table 3).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Have you committed any medical errors during your internship?</th>
<th>$\chi^2$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>14.6%</td>
<td>1.45</td>
<td>0.483</td>
</tr>
<tr>
<td>Anxiety</td>
<td>34.1%</td>
<td>2.19</td>
<td>0.7</td>
</tr>
<tr>
<td>Stress</td>
<td>14.6%</td>
<td>6.89</td>
<td>0.032</td>
</tr>
<tr>
<td>Burnout</td>
<td>51.2%</td>
<td>3.95</td>
<td>0.047</td>
</tr>
</tbody>
</table>

**Figure 1.** Distribution of depression, anxiety, and stress levels among studied participants.
Burnout and depression

Table 3. Spearman's correlation analysis between total Maslach Burnout Inventory scores and its components.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total burnout score</th>
<th>Emotional exhaustion score</th>
<th>Depersonalization score</th>
<th>Personal accomplishment score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$r$ (p-value)</td>
<td>$r$ (p-value)</td>
<td>$r$ (p-value)</td>
<td>$r$ (p-value)</td>
</tr>
<tr>
<td>Total DASS score</td>
<td>0.45 (&lt;0.001)</td>
<td>0.47 (&lt;0.001)</td>
<td>0.42 (&lt;0.001)</td>
<td>0.33 (&lt;0.001)</td>
</tr>
</tbody>
</table>

Discussion

This study aimed to look at whether higher levels of burnout and stress would be associated with an increased number of medical errors made by medical interns on rotation.

The life of a physician is demanding, and many interns struggle to transition from medical school to the responsibility of the working environment. These difficulties which trainees face might be attributed to lack of experience in coping with stressful surroundings, as well as the burden of future career and training decisions [21, 22]. Burnout is associated with high levels of occupational stress [23]. The current study found a considerable number of the participants to have burnout (38%), this percentage is similar to the previous studies [24, 25].

The previous studies observed high prevalences of stress (29.7%), anxiety (39.9%), and depression (26.2%) and burnout (50%) [26, 27]. Contrary to these studies, the percentage of depression and anxiety among the participants in this study was relatively lower (6.1%, 19.6%, 19.5%, and 38%, respectively).

Depression, anxiety, stress, and burnout often occur together. For example, in a prior study, a significant overlap was found between burnout and depression among trainee physicians [28], whereas, in this study it was found that medical interns were more likely to be depressed and based on previously done studies depression was significantly correlated with burnout [29].

A recent meta-analysis of 47 studies and over 4,200 physicians determined that physician burnout increases the likelihood of adverse patient safety occurrences [30]. Other similar studies also concluded that burnout was linked to perceived medical errors among interns and residents with greater degrees of burnout [12].

In line with previous research, the current results showed that participants who were stressed and burned out were more likely to commit medical errors. Therefore, measures to reduce stress and burnout among medical interns are urgently needed. Strategies to address burnout among interns would ensure that their well-being is maintained and/or improved, which would ultimately enable them to continue to provide the highest possible quality of patient care continuously. Although the currently used questionnaires were intended to detect stress and burnout among the medical interns, it is quite likely that medical interns suffering from burnout might be less inclined to complete the online surveys due to competing interests such as time pressure and/or lack of energy or interest.

Conclusion

Physician burnout could lead to inattentive behavior, medical errors, and lead to malpractice, all of which reduce patient satisfaction and affect treatment quality and disease outcomes. Burnout is a major concern among interns, according to the current research. The findings of the current study strongly indicates that further investigation and implementation of methods aimed at preventing burnout are urgently needed to protect the quality of life of young medical doctors and ultimately preserve the quality of delivery provided to their patients. Although burnout among healthcare workers and its impact on patient care has been extensively studied, research on the link between it and medical errors is inadequate. More studies are required to accurately define this probable association.

List of Abbreviations

DASS Depression, Anxiety, and Stress Scale

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

None.

Consent to participate

Written informed consent was obtained from all the participants.

Ethical approval

The study was approved by the Institutional Review Board of the biomedical ethical committee at King Abdulaziz University Hospital (Ref: 658-20) Monday, December 21, 2020.

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References

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