

## Association between burnout & sleep quality among physicians working in primary health care centers under ministry of health, Jeddah 2019

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### Abstract

**Introduction:** Physician's multiple struggles with time and prolonged stress, in addition to poor sleep would lead to physical and emotional exhaustion. Therefore, physician's burnout occurs; consequently their performance, judgment and ability to conduct a proper patient care will be affected. The current study aimed at enhancing the quality of care provided to the patients by assessing the relationship between burnout & sleep quality among physicians working in Primary health care centers (PHCC) under Saudi ministry of health, Jeddah 2019.

**Materials and Methods:** Through a cross-sectional design, a representative sample of 229 of physicians working at primary health care centers were randomly selected to answer two Self-administered validated questionnaire, Sleep Quality Index (PSQI) to evaluate the sleep quality over a one-month period and Maslach burnout Inventory (MBI) to assess the overall of burnout. Chi-square analysis and univariate regression analysis were performed using statistical package for the social science (*SPSS version 23*).

**Results:** Overall, a moderate to high burnout scores in the present study was seen among 37.2% physicians, Depersonalization was noted in 89.1%, Emotional exhaustion and personal accomplishment was (67,2% and 42, 1%) respectively. Regression analysis showed being a resident, having specific PHCC administrative tasks, few available doctors (less than 5), and high patients load in OPD per day (OR= 1.06, p<0.001) were main contributors for burnout. Dissatisfaction with the working environment, limited resources available in the PHCC (OR=1.93, p=0.059) and working relation with their manager and other nursing staff were also significantly associated with developing burnout symptoms (OR = 2.35, P = 0.024). Weak positive correlation was noted between number of patients per day and burnout (p<0.001). Sleep disturbance was an independent risk factor of burnout (OR=2.77, p=0.035).

**Conclusion:** More than one-third of the physicians working at Jeddah PHCCs had moderate to high burnout score with sleep disturbance. Several factors like increasing number of doctors, limiting additional workload and improving the facilities need to be addressed to decrease burnout level among physicians. This will ultimately improve the patient care.

**Keywords:** Burnout, Exhaustion, Family physician, Insomnia, Sleep.

### Introduction

There are increasing concerns regarding the physicians' well-being on both the individual level, where it relates to personal health, as well as the patient level, that is to provide high-quality healthcare.<sup>1</sup>

Burnout was initially described by Maslach et al.<sup>2</sup> and a relevant statement has been adopted by the World Health Organization and the European Forum of Medical Associations concerning burnout in 2003.<sup>3</sup> This condition constitutes three major domains: emotional exhaustion (a stress dimension that indicates a depletion of the emotional resources), depersonalization (detachment and dehumanization), and impaired personal achievement (a decline in professional competence and work productivity).<sup>4</sup>

Interestingly, some medical specialties, including family medicine, general internal medicine, and emergency medicine, are more liable to an increased risk of burnout rather than inpatient physicians. Burnout syndrome can also occur as early as in medical students and residents with similar rates to those with full license and practice.<sup>5</sup>

On the other hand, it seems that there might be an interplay between distinct factors leading to burnout. Work stress or the failure to match between the personal and workplace expectations would result in fatigue, mood disorders, and sleep problems. Such factors might ultimately contribute to burnout development. Fatigue is a well-established component yet, however, mental disorders and

sleep disorders are potential complementary risk factors.<sup>6</sup> In particular, disturbed sleep is more pronounced with chronic exposure to job strain. There is an interchangeable relationship between disturbed sleep and burnout, where it has been found that insomnia and burnout predicted each other.<sup>7</sup>

Both sleep disturbance and burnout are closely associated with chronic stress. Nonetheless, the causal relationship between both conditions is still unclear. Multiple longitudinal studies have indicated the impact of burnout on the levels of anxiety and worry, while the increased levels of affective arousal could lead to insomnia.<sup>8,9</sup> On the other hand, given that prolonged sleep disturbance is associated with chronic depletion of personal energy resources, it can exert a mechanistic potential to the development of burnout syndrome.<sup>10</sup>

Focusing on physicians, several factors are implicated in sleep disturbance, such as high workload, emotional interactions, demanding work hours, the necessity to make critical judgements, and implementing maximum shift durations and maximum quantity of night work.<sup>11</sup> There are few studies conducted on burnout and sleep quality among primary health care physicians working in Jeddah. The present study aims to assess the prevalence and correlation of burnout & sleep, as well as to identify the factors contributing to physicians' burnout and sleep disturbance

among physicians working in Primary Health care centers (PHCCs) under Ministry of Health (MOH), Jeddah

## Materials and Methods

An analytical cross-sectional study was conducted among physicians working in PHCCs under the umbrella of MOH in Jeddah city, 2019. The duration of the study was five months from Oct 1, 2019, to Feb 31, 2019. Estimated burnout prevalence taken from other study was 25.2% among PHCCs physicians in Jeddah.<sup>12</sup> The total population of physicians working in Jeddah PHCCs taken from MOH and Directorate of Health Affairs was 450. Using these values in EPI-tool software keeping confidence interval at 95% and alpha level of 5% the calculated sample size was 176 physicians. This sample size was increased by 10% to address for non-response and it became 194. Study sample included family physicians (consultants, specialists and residents), general practitioners and dentists and other specialties working in these PHCCs. We used multistage sample technique for data collection.

Jeddah has a total of 47 PHCCs which were stratified in 5 clusters according to their affiliation with the hospitals. We calculated the proportion of doctors to be interviewed from each cluster.

Afterward, the physicians were randomly selected using simple random technique.

A reliable, widely used two validated questionnaire (considered as Gold standard) was used in collect the data and to check the overall burnout and sleep quality.<sup>13,14</sup>

**Sleep Quality Index (PSQI):** It is a 19-item scale used to assess sleep quality over one-month period through seven items: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. A score more than 5 is indicated of poor sleep.

**Maslach burn out Inventory (MBI):** is a validated tool used to measure occupational burnout. It has a total of 22 questions and three components: emotional exhaustion (9 items) which measures loss of emotional energy, depersonalization (5 items) measures an unfeeling and impersonal response toward patients care, treatment, or instruction and personal accomplishment (8 items) measures feeling of loss of achievements or competence. Scoring range from (Never (0) to every day (6), the higher the score in emotional exhaustion and depersonalization items, higher the prediction of burnout. However, in personal accomplishment item lesser the score, higher the prediction of burnout.

Physicians who worked for more than six months were selected for this study after obtaining their written consent to participate. The confidentiality of study subjects was ensured.

Data entry and analysis was done using Computer programs: (*SPSS ver 23*). A p value less than 0.05 considered significant. Chi-square tests was used to measure the associations between burnout & sleep quality. Backward Wald technique in Log Regression Analysis (sociodemographic factors\working environment and overall burnout) to see the predictors for burnout was used. Univariate analysis using chi-square was performed. All significant variables were included in the regression analysis.

Ethical approval was taken from the research committee of Ministry of Health Directorate of Health Affairs, Jeddah. (H-02-J-002).

## Results

A total of 183 physicians working in PHCCs with mean age of  $37 \pm 6.4$  years were included. Out of them around 33.9% (n=62) were general practitioners and family medicine residents were 9.2% (n=17) as shown in fig 1. Other demographic variables are given in table 1.

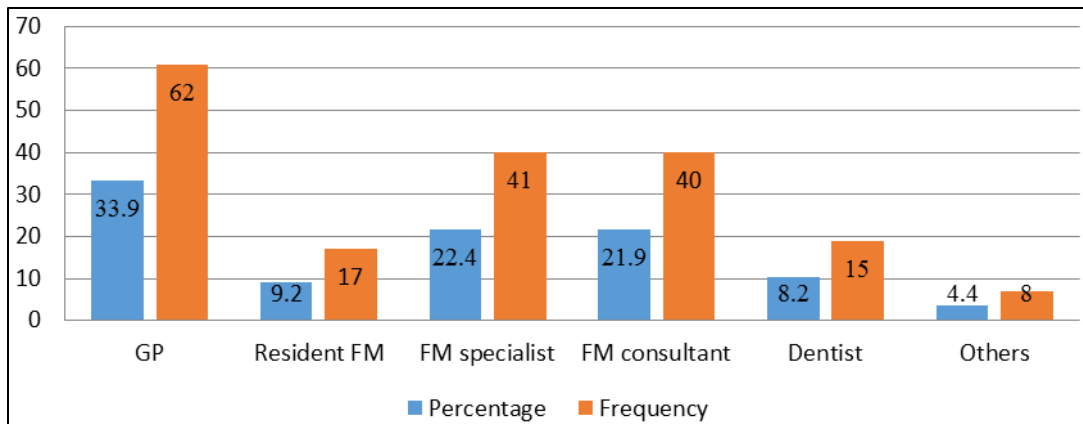
Physicians having more than 5 years working experience were around 42.6%. Majority of the physicians had no additional administrative work 33.9% (n=62). Out of those assigned additional administrative work, PHCC administration (n=52, 28.4%) and training and teaching were the most common (n=43, 23.5%).

On an average the patient load in OPD was around 15 to 30 patients per day. Meanwhile, 13.7% of doctors were seeing more than 45 patients per day. Mean average OPD was around  $28 \pm 13.7$  patients. Around 68% of the physicians were unsatisfied with infrastructure and cleanliness, while around 53% of them were unsatisfied with the available resources in the primary health care centers. Majority of the doctors (65%) feel that they don't have the opportunity to update their knowledge. Most of the physicians (77%) were satisfied with their relationships with the PHCC administrator and other staff members. Only 56% physicians believed that the workload among the physicians was properly distributed. The Number of doctors was less than five physicians in around 90.7% (n=166) of PHCCs, whereas more than ten working physicians in minority of PHCCs was around 2.7% (n=5).

**Table 1:** Demographic Variables of Physicians(n=183)

| Demographic Variables |                    | Frequency | Percentage (%) |
|-----------------------|--------------------|-----------|----------------|
| Gender                | Male               | 57        | 31.1           |
|                       | Female             | 126       | 68.9           |
| Age group             | 25-34 years        | 85        | 46.4           |
|                       | 35 to 44 years     | 61        | 33.3           |
|                       | 45 to 54           | 34        | 18.6           |
|                       | More than 55 years | 3         | 1.6            |

|                       |          |     |      |
|-----------------------|----------|-----|------|
| <b>Marital status</b> | Single   | 31  | 16.9 |
|                       | Married  | 139 | 76   |
|                       | Widow    | 1   | 0.5  |
|                       | Divorced | 12  | 6.6  |



**Fig 1:** Percentage and frequency for different occupational status of working physicians.

Overall moderate to high burnout was noted in n= 68 (37, 2%) physicians while n=115 (62.8%) had no to low burnout. Out of total 183 doctors 123(67, 2%) were suffering from moderate to high emotional exhaustion. Moderate to high depersonalization was noted in 163(89, 1%) physicians while moderate to high Personal accomplishment was noted in 77 (42, 1%) as shown in table 2. The prevalence of sleep deprivation among physician working in PHCCs were 147(80.3%) whereas, only 36(19.7%) had good sleep in the past month (table 2).

**Table 2:** Burnout Categories and Sleep quality among physicians working in PHCCs (n=183)

| <b>Burnout and sleep categories</b> |                          | <b>Frequency</b> | <b>Percent</b> |
|-------------------------------------|--------------------------|------------------|----------------|
| Emotional Exhaustion                | Low or no burnout        | 60               | 32.8           |
|                                     | Moderate to high burnout | 123              | 67.2           |
| personal accomplishment             | Low or no burnout        | 106              | 57.9           |
|                                     | Moderate to high burnout | 77               | 42.1           |
| Depersonalization                   | Low or no burnout        | 20               | 10.9           |
|                                     | Moderate to high burnout | 163              | 89.1           |
| Overall Burnout                     | Low or no burnout        | 115              | 62.8           |
|                                     | Moderate to high burnout | 68               | 37.2           |
| Sleep categories                    | good sleep               | 36               | 19.7           |
|                                     | poor sleep               | 147              | 80.3           |

The overall mean score for burnout was 28.38 (±9, 19). Emotional exhaustion and personal accomplishment mean scores were 19.21 and 13.15 respectively as shown in table 3.

**Table 3:** Mean score and standard deviation of burnout and sleep quality

| <b>Category</b>         | <b>Mean score</b> | <b>SD</b> |
|-------------------------|-------------------|-----------|
| Burnout:                |                   |           |
| Overall Burnout         | 28.38             | 9.19      |
| Emotional exhaustion    | 19.21             | 6.59      |
| Personal Accomplishment | 13.15             | 5.11      |
| Depersonalization       | 11.09             | 3.68      |
| Total sleep Score       | 7.65              | 3.32      |

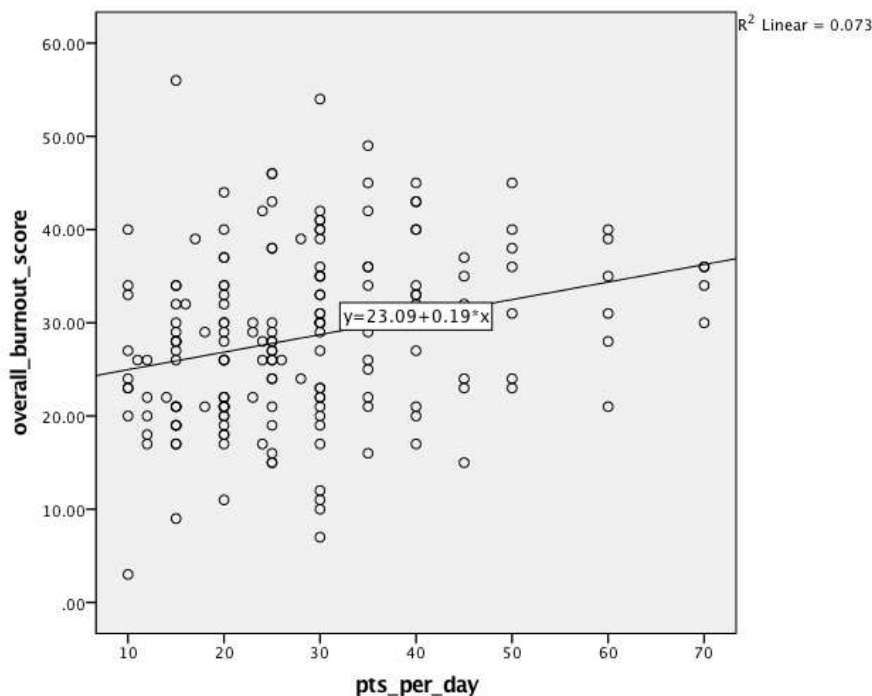
Chi-square analysis was conducted to test the association between sociodemographic factors and overall burnout, significant association of high burnout was observed among those with higher experience (P value =0.025). GPs and family medicine residents were suffering from higher burnout as compared to specialist/consultants (P value =0.024).

Another Chi-square analysis was conducted to test the association between working environment/conditions factors and overall burnout, significant association shown in table 4

**Table 4:** Working environment/conditions and it's relation to burnout

| Working environment variable                                      | Overall burnout          |                                 | p-value |
|-------------------------------------------------------------------|--------------------------|---------------------------------|---------|
|                                                                   | No or low burnout No.(%) | Moderate or high Burnout No.(%) |         |
| Additional administrative work:                                   |                          |                                 | 0.014   |
| Training and teaching                                             | 30(69.8)                 | 13(30.2)                        |         |
| PHCC administration                                               | 23(44.2)                 | 29(55.8)                        |         |
| quality control                                                   | 9(75.0)                  | 3(25.0)                         |         |
| accreditation work                                                | 1(33.3)                  | 2(66.7)                         |         |
| none                                                              | 46(74.2)                 | 16(25.8)                        |         |
| Combination                                                       | 6(54.5)                  | 5(45.5)                         |         |
| Satisfaction with the Working environment and available resources |                          |                                 | 0.015   |
| Yes                                                               | 62(72.1)                 | 24(27.9)                        |         |
| No                                                                | 53(54.6)                 | 44(45.4)                        |         |
| manager and other staff relationship satisfaction:                |                          |                                 | 0.008   |
| yes                                                               | 93(68.4)                 | 43(31.6)                        |         |
| No                                                                | 22(46.8)                 | 25(53.2)                        |         |
| Number of doctors per day:                                        |                          |                                 | 0.044   |
| less than 5                                                       | 88(59.5)                 | 60(40.5)                        |         |
| 5-10                                                              | 14(66.7)                 | 7(33.3)                         |         |
| more than 10                                                      | 13(92.9)                 | 1(7.1)                          |         |

As the number of patients increased per day, the overall burnout in the doctors also increased, as shown in the graph. There is a positive weak correlation between number of patients per day and overall burnout. (Person correlation = 0.271, P < 0.001).



**Fig. 2:** Scatter Plot showing Correlation between Daily OPD and burnout

Chi square analysis for association between sleep quality and sociodemographic data showed statistical significance in marital status, married doctors complained more of the poor sleep quality (p=0.008). While, the other sociodemographic variables and environment/conditions had no significant association with the quality of sleep.

One factor in working environment affecting sleep quality is shown in table 6.

**Table 6:** Working environment/conditions and it's relation to sleep quality

| Working environment/conditions | Sleeping groups          |                          | p-value |
|--------------------------------|--------------------------|--------------------------|---------|
|                                | good sleep<br>N= No. (%) | poor sleep<br>N= No. (%) |         |
| Number of doctors per day      |                          |                          |         |
| less than 5                    | 27 (18.2)                | 3 (14.3)                 | 0.069   |
| 5-10                           | 6 (42.9)                 | 18 (85.7)                |         |
| more than 10                   |                          | 8 (57.1)                 |         |

The correlation between burnout (MBI) and sleep quality (PSQI) among doctors working in PHC 2019, Jeddah showed a significant association as given in table 7.

**Table 7:** Correlation between burnout and sleep quality

|              |            | Burnout categories |                          | P-value          |
|--------------|------------|--------------------|--------------------------|------------------|
|              |            | No or low burnout  | Moderate or high burnout |                  |
| Sleep groups | good sleep | 28(24.3)           | 87 (75.7)                | 0.039<br>OR=2.41 |
|              | poor sleep | 8 (11.8)           | 60 (88.2)                |                  |

Logistic regression analysis was applied. As shown in table 8, four factors were highlighted as significant predictors for overall burnout. Regression analysis highlighted that the overall burnout was effected within the physicians relation with other staff members. ( OR = 2.35, P = 0.024 ) similarly physicians getting less sleep were about 3 times more burnout as compared to those having proper sleep ( OR = 2.77, p = 0.035 ) increase in patient load was also significantly associated with overall burnout. Limited available resources at the PHCC was also a predictor for burnout however the value was not significant (OR = 1.93, p=0.05) as shown in the table 8.

**Table 8:** Regression for Sleep quality and overall burnout

| Variable                  | B     | S.E. | Wald   | df | Sig.  | Odds ratio (OR) | 95% C.I. |       |
|---------------------------|-------|------|--------|----|-------|-----------------|----------|-------|
|                           |       |      |        |    |       |                 | Lower    | Upper |
| Available Resources       | .660  | .349 | 3.567  | 1  | .059  | 1.934           | .975     | 3.836 |
| Relationship with staff   | .855  | .379 | 5.094  | 1  | .024  | 2.352           | 1.119    | 4.944 |
| Sleep category            | 1.020 | .485 | 4.426  | 1  | .035  | 2.773           | 1.072    | 7.172 |
| Number of patents per day | .065  | .015 | 19.237 | 1  | .0001 | 1.067           | 1.037    | 1.099 |

## Discussion

The study aimed towards enhancing the quality of provided care to the patients by assessing the relationship between burnout and sleep quality among physicians working in PHC centers. We found in the present study that 37.2% of the included physicians experienced moderate to high scores of burnouts. Furthermore, being a resident and general practitioner, having specific PHCC administrative tasks, low numbers of working doctors (less than 5), and high number of checked patients per day, as well as dissatisfaction with the working environment and sources and dissatisfaction with the relationship with manager and other staff were significantly associated with developing burnout symptoms. Significantly, sleep disturbance was an independent risk factor of burnout.

### The vulnerability of family medicine physicians to burnout

In 2017, family medicine physicians ranked third among other specialties who developed burnout in the United States.<sup>15</sup> However, the causes and associated factors of burnout in this specialty remained unclear. Physicians' job demand is an important determinant of job stress in family medicine. Such a specialty is not limited by patient's age, gender, or the place where care is provided. It has a broad

scope of practice and its implication at the healthcare level is beneficial for reducing the odds of hospitalization and the overall cost of care<sup>(16)</sup>. The challenge is that a family doctor is either employed or is integrated as a member of an organized staff, which could affect the professional satisfaction.

In the literature, burnout prevalence among family physicians ranged from 25% to 63%,<sup>17-20</sup> and our prevalence rate lies within these limits. In our analysis, both depersonalization and emotional exhaustion represented the highest domains among the participating physicians (89.1% and 67.2%, respectively), which is consistent with previous reports among family physicians in Saudi Arabia,<sup>12</sup> Canada<sup>19</sup> and Turkey.<sup>21</sup>

### Sleep disturbance and burnout

Regarding relation between sleep disturbance and burnout, the present study shows a significant correlation between sleep disturbance and the risk of burnout.

Physicians with a disturbed sleep in present study were around 3 times more likely to develop burnout as compared to their peers with normal sleep. From a general psychiatric perspective, this was consistent with a previous report which indicated a 3.5-fold increased risk of having a depressive episode in people with persistent sleep problems.<sup>22</sup>

### Burnout in residents and general practitioner: a remarkable burden

In the present study, we found a statistically significant increase in the number of FM residents and general practitioner with moderate to high burnout rather than more experienced FM physicians. New doctors may exhibit psychological morbidity and burnout symptoms as they undergo new experience of dealing with sick patients. Personal variation might play an important role in the response of them to their new overwhelming feeling of the risk of doing a mistake that might cost someone their life<sup>(23)</sup>. Several domains are affected in the daily life of those doctors, including a lack of motivation, impaired higher order thinking, less communication with other staff and perceived medical errors.<sup>24</sup>

### The perceived consequences of burnout on the physician, patient, and organization

The health consequences of burnout are detrimental. Professional distress can lead to severe mental manifestations, including depression, anxiety, and this could be associated with divorce, broken relationships and suicide.<sup>25</sup> Finally, as for patient care, physician burnout can be associated with increased medical errors and a higher risk of malpractice. This would ultimately reflect on the quality of provided care and patient outcomes.<sup>26</sup>

### Limitations

In the present study, we used the MBI which has been validated to investigate burnout and sleep quality (PSQI) tools among the participants. However, we computed the risk factors of burnout in a cross-sectional design, which might be better elicited in longitudinal studies to identify other confounding factors that might interfere with the interpretation. Additionally, it's covering the PHCC under the ministry of health which can't be generalized to other hospitals and centers.

### Conclusion

Burnout has major significances related to Doctors' health. More than one-third (37.2%) of the physicians in Jeddah had moderate to high burnout scores, and this was associated with the parameters of increased workload. Notably, physicians with a sleep disturbance had a 3-fold increase in the risk of developing burnout when compared to other with proper sleep.

Based on current study, the prevalence rate indicates that this issue is rooted in the healthcare system rather than to the personal characteristics. This indicate urgent interventions that could affect the quality of life of the physicians. This way, healthcare organizations are required to address the associated factors.

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