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Burnout and Sleep Deprivation in Healthcare Professionals in Karachi: Investigating the Connection

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Abstract

Background

Sleep deprivation is an increasing concern among healthcare professionals, as it significantly affects their mental and physical well-being. Concurrently, burnout rates in this population have been rising, impacting job performance and patient care. Despite these concerns, the relationship between sleep duration and burnout remains insufficiently explored.

Objective

This study aimed to investigate the relationship between sleep duration and burnout among healthcare professionals in Karachi, identifying patterns of sleep deprivation and its potential effects on occupational stress.

Methodology

A cross-sectional study was conducted involving 330 healthcare professionals from medical organisations in Karachi. Participants were selected through non-probability convenience sampling. Data pertaining to sleep characteristics, work-related stress, and burnout symptoms were gathered using structured questionnaires. The association between sleep duration and burnout was analysed using multivariate logistic regression, with statistical significance set at $p < 0.05$.

Conclusion

The findings revealed that a significant proportion of healthcare professionals experienced insufficient sleep, particularly on workdays, with 49.1% reporting only 5-6 hours of sleep. Sleep deprivation was more prevalent among female professionals, and those with shorter sleep durations reported higher rates of work-related stress and burnout. A statistically significant relationship was identified between sleep duration and occupational burnout, emphasizing the need for interventions that promote better sleep hygiene and workload management. Addressing sleep deprivation in healthcare settings may enhance well-being, job satisfaction, and patient care outcomes.

Keywords: burnout, medical professionals, sleep deprivation, depression, low self-esteem

Introduction:

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Burnout is a psychological syndrome that arises from chronic workplace stress characterized by three primary dimensions: emotional exhaustion, depersonalization, and a diminished sense of personal accomplishment. This condition has implications not only for individuals but also for organizations and the quality of care delivered in therapeutic contexts, particularly in healthcare settings where emotional demands are high.

Emotional exhaustion refers to feelings of being overextended and depleted of one's emotional resources, which is often the most noticeable symptom of burnout. Studies indicate that high job demands and ongoing emotional work contribute significantly to emotional exhaustion among

healthcare professionals Shead et al. (1). Depersonalization manifests as a negative or cynical attitude towards one's patients or clients, potentially jeopardizing the quality of care(2). Lastly, a lack of personal accomplishment entails feelings of ineffectiveness and a sense of failure, leading to low morale and job satisfaction among professionals (3). Burnout and sleep deprivation among healthcare professionals have garnered considerable attention, particularly during the COVID-19 pandemic. Research indicates a strong association between burnout and sleep disturbances, leading to adverse effects on both the mental and physical health of healthcare workers.

A substantial body of evidence highlights that healthcare professionals, especially those treating COVID-19 patients, experienced pronounced symptoms of burnout. For instance, a study revealed that 67% of healthcare professionals experienced burnout during this period(4). Additionally, data from multiple countries established that chronic exposure to stress from demanding work environments contributed significantly to burnout, exacerbated by the increased workload and irregular working hours necessitated by the pandemic(5, 6). The cumulative effects of these stressors are seen distinctly among intensive care unit (ICU) staff, whose roles often entail navigating heightened fatigue and compromised cognitive functions, directly impacting patient safety and quality of care(7).

Moreover, the psychological burden shouldered by medical staff frequently manifests as sleep disorders. A systematic review confirms a notable prevalence of insomnia among medical personnel, further aggravated by the pressures of managing critically ill patients in high-stakes environments(8, 9). The interplay between burnout and sleep deprivation is significant; studies indicate that healthcare workers with burnout symptoms often report sleep initiation and maintenance disorders(6, 9). As sleep quality deteriorates, the symptoms of burnout may intensify, creating a vicious cycle wherein inadequate rest further exacerbates emotional exhaustion and stress levels (10, 11).

Investigations into the impact of organizational factors highlight that a lack of support at work, coupled with high job demands, significantly correlates with burnout and sleep disturbances (12, 13). The psychological toll observed in frontline workers is not unique to the pandemic but has been a persistent issue contributing to greater burnout prevalence in high-stress fields such as emergency and intensive care medicine(14, 15). Furthermore, chronic stress responses linked to persistent work overload can impair physiological systems, leading to increased vulnerability to various health complications, including cardiovascular issues and mental health disorders(16, 17).

While both sleep deprivation and burnout are widely acknowledged as pressing issues, the intricate relationship between the two remains underexplored, particularly in specific contexts such as healthcare systems in Karachi. Understanding this relationship is crucial to developing targeted interventions to improve healthcare professionals' well-being, enhance job satisfaction, and safeguard patient care quality. By addressing the patterns of sleep deprivation and its potential effects on occupational stress, this study seeks to fill the research gap and provide evidence-based insights to support healthcare policy reforms and workplace wellness programs.

This study is the first to explore the link between burnout and sleep deprivation among medical professionals in Karachi. It aims to identify their prevalence, causes, and impact on well-being and performance. The findings will help develop targeted interventions to improve work-life balance, job satisfaction, and patient care while contributing to future research on occupational health in Pakistan.

Materials and Methods

Study Design and Participants

This study utilized a descriptive cross-sectional design to assess the correlation between burnout and sleep deprivation among medical professionals in Karachi, Pakistan. A total of 330 healthcare professionals, including both male and female participants working in hospitals, clinics, and other medical organizations within Karachi, were included. Participants were selected using non-probability convenience sampling, where individuals were recruited based on their availability and willingness to participate.

Data collection was conducted between November and December 2024 using a structured survey. The inclusion criteria required participants to be licensed

medical professionals with at least one year of work experience in Karachi. Exclusion criteria included:
(a) medical students or professionals in training,
(b) lack of consent to participate, and
(c) incomplete survey responses.

Ethical Considerations

Before data collection, all participants were provided with detailed information about the study, including its objectives and procedures. Participation was voluntary, and individuals could withdraw at any stage without any repercussions. Written informed consent was obtained from all participants. The study was approved by the Institutional Research Ethics Committee, and all procedures followed the ethical principles outlined in the 1975 Declaration of Helsinki and its subsequent amendments.

Variable Measurements

Sociodemographic Data

A registration form was used to collect key demographic details, including age, gender, years of experience, and professional role.

Sleep Duration

Sleep duration was assessed through the question:
"How many hours do you sleep on workdays and days off?"
Participants selected one of the following response categories:
<7 hours = Short sleep
≥7 hours = Adequate sleep
Due to time constraints in accessing healthcare professionals, a simplified question format was used instead of an extensive questionnaire, a method validated in previous research.

Burnout Measurement

Burnout was assessed using a modified and validated scale based on the Maslach Burnout Inventory (MBI). The instrument consisted of 22 items measured on a 7-point Likert scale (0 = "Never" to 6 = "Every day"). The scale evaluated three key dimensions of burnout:
The reliability of the instrument was confirmed with a Cronbach's alpha coefficient of 0.95.

Statistical Analysis

Categorical variables were presented using frequencies (%), while numerical variables were reported as medians and interquartile ranges (IQRs). An Independent t-test was used to compare stress levels based on sleep duration.
Confounding variables were controlled based on epidemiological criteria.
A p-value < 0.05 was considered statistically significant. All statistical analyses were performed using SPSSv21 software.

Table: 01 Demographic characteristics of sample

Characteristics		n	%
Gender			
	Female	180	54.5
	Male	150	45.4
	Total	330	100.0
Profession			
General Dentist		192	58.2
Doctor		36	10.9
Medical Educationist		12	3.6
House officer		24	7.3
Academician		18	5.5
Maxillofacial surgeons		6	1.8
undergraduate		6	1.8
Pharmacist		18	5.5
Cardiologist		6	1.8
Dentist - Prosthodontist		6	1.8
Years of Experience			
1-5 years		198	32.0
6-10 years		48	7.8
11-15 years		30	4.9
16-20 years		12	1.9
21-25 years		12	1.9
>25 years		12	1.9
Nil		18	2.9
Organization			
Clinics and Private organization		138	41.8
Clinics and government organization		192	58.2

Result:

The study included a total of 330 participants, with 54.5% (n = 180) being female and 45.4% (n = 150) male.

The majority of participants were General Dentists, accounting for 58.2% (n = 192) of the sample. Doctors made up 10.9% (n = 36), followed by Medical Educationists (3.6%, n = 12), House Officers (7.3%, n = 24), and Academicians (5.5%, n = 18). Smaller proportions included Maxillofacial Surgeons (1.8%, n = 6), Undergraduates (1.8%, n =

6), Pharmacists (5.5%, n = 18), Cardiologists (1.8%, n = 6), and Prosthodontists (1.8%, n = 6).

Years of Experience

The majority of participants had 1-5 years of professional experience (32.0%, n = 198). Other groups included those with 6-10 years of experience (7.8%, n = 48), 11-15 years (4.9%, n = 30), 16-20 years (1.9%, n = 12), 21-25 years (1.9%, n = 12), and over 25 years of experience (1.9%, n = 12). Additionally, 2.9% (n = 18) of participants reported having no professional experience.

Organizational Background

Regarding workplace settings, 41.8% (n = 138) of participants were associated with private clinics or organizations, while 58.2% (n = 192) worked in both clinics and government organizations.

Table: 02 Sleep Characteristics

Sleep Characteristics		**n**	**%**
Hours of sleep on workdays	2 hours	6	1.8
	3-4 hours	12	3.6
	5-6 hours	162	49.1
	7-8 hours	144	43.6
Hours you sleep on days off	10-12	30	9.1
	24 hours	6	1.8
	5-6	42	12.7
	7-9	246	74.5
	what are days off	6	1.8
Experience difficulty falling asleep or staying asleep?	Most of the time	84	25.5
	Never	18	5.5
	Occasionally	174	52.7
	very less	54	16.4
Feel well-rested after sleep	No	120	36.4
	Yes	210	63.6
Naps during the day due to inadequate sleep at night	No	174	52.7
	Yes	156	47.3

Sleep Duration on Workdays

The majority of participants reported sleeping for 5-6 hours on workdays, representing 49.1% (n = 162) of the sample. This was followed by those who slept for 7-8 hours (43.6%, n = 144). A smaller proportion of participants reported shorter sleep durations, with 3-4 hours of sleep reported by 3.6% (n = 12) and only 1.8% (n = 6) reporting 2 hours of sleep.

Sleep Duration on Days Off

On days off, a significant proportion of participants achieved longer sleep durations, with 74.5% (n = 246) reporting 7-9 hours of sleep. Sleep durations of 10-12 hours were reported by 9.1% (n = 30), while 12.7% (n = 42) of participants reported sleeping for 5-6 hours. A small proportion (1.8%, n = 6) reported either 24 hours of continuous sleep or indicated unfamiliarity with the concept of "days off."

Difficulty Falling Asleep or Staying Asleep

A majority of participants occasionally experienced difficulty falling or staying asleep, accounting for 52.7% (n = 174). This was followed by 25.5% (n = 84) who reported such difficulties "most of the time." A smaller group reported experiencing difficulties "very less" (16.4%, n = 54), while 5.5% (n = 18) indicated that they never experienced any issues with sleep initiation or maintenance.

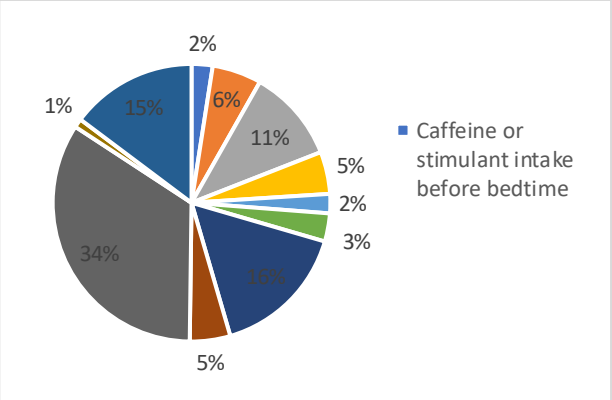
Feeling Well-Rested After Sleep

The majority of participants (63.6%, n = 210) reported feeling well-rested after sleep, while 36.4% (n = 120) did not feel adequately rested.

Daytime Napping

About 47.3% (n = 156) of participants indicated taking naps during the day due to inadequate sleep at night. The remaining 52.7% (n = 174) reported not requiring daytime naps.

Figure 01: Factors Contributing sleep disturbance

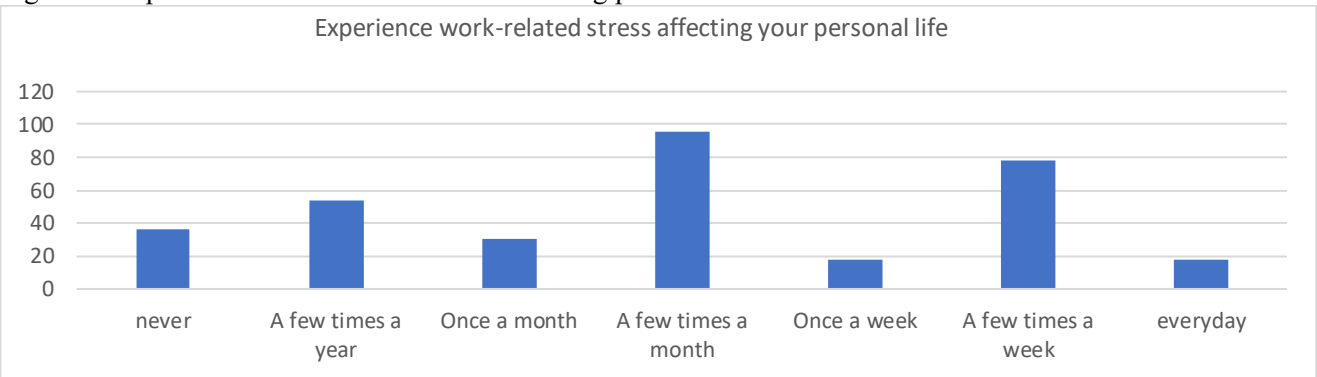


The Figure illustrates various factors contributing to sleep disturbances among participants like:

Irregular Sleep Schedule (34%): This was identified as the most significant contributor to sleep disturbances, highlighting the impact of inconsistent sleep patterns on overall rest.

Uncomfortable Sleeping Environment (16%): Factors such as unsuitable mattresses, improper room temperature, and other environmental conditions were the second most common cause, emphasizing the importance of optimizing the sleep setting.
Family or Household Responsibilities (15%): The third leading factor, reflecting the burden of personal obligations on sleep quality.
Caffeine or Stimulant Intake Before Bedtime (11%): Late-night consumption of coffee or other stimulants was a considerable factor in disrupting sleep initiation.
Social Commitments or Late-Night Activities (6%): This suggests that social engagements can lead to a reduced or irregular sleep routine.
Frequent Nighttime Awakenings (5%): Participants indicated waking up often during the night, which interrupts sleep continuity.
Other Factors (5%): Includes miscellaneous or unspecified causes of sleep disturbances.
Unknown Causes (3%): For a small percentage, the reasons for sleep disturbances were unclear or unidentified.
Medical Conditions (2%): Chronic health issues such as insomnia or sleep apnea were less frequently reported but still notable contributors.
Stress or Anxiety (2%): Psychological factors like stress played a minor but impactful role in affecting sleep quality.
Noise (1%): External noise disturbances had the least contribution but still affected some participants

Figure 02: Episodes of work-related stress affecting personal life



How frequently do participants experience work-related stress that impacts their personal lives:
Never: Around 36 individuals reported that work-related stress does not affect their personal lives, indicating a minority of participants who manage to maintain a work-life balance effectively.
A Few Times a Year: Approximately 54 participants experience stress only occasionally throughout the year, suggesting that work-related pressures are infrequent for this group.
Once a Month: Around 30 individuals face work-related stress on a monthly basis, indicating a moderate but periodic impact on their personal lives.
A Few Times a Month: Stress occurs more frequently for about 96 participants, representing the largest group. This highlights the prevalence of work-related stress among healthcare professionals and its significant impact on personal well-being.
Once a Week: Approximately 18 participants encounter stress weekly, reflecting regular exposure to work-related challenges affecting their personal lives.
A Few Times a Week: Around 78 individuals report experiencing stress multiple times a week, demonstrating a substantial and recurring pattern of stress in this group.
Everyday: A total of 18 participants face work-related stress daily, indicating the most severe and persistent level of stress affecting their personal lives.

Table: 03 Sleeping hours of different genders

		Hours of sleep				P-value
		2 hrs	3-4hrs	5-6hrs	7-8hrs	
Gender	Male	6	12	54	78	<0.001
	Female	0	0	108	66	
Total		6	12	162	144	
Off sleep						
Gender		10-12	24 hours	4-6	7-9	P-value
Male		18	6	12	114	<0.001
Female		12	0	30	132	

The table reveals a statistically significant association between sleep duration on workdays and gender, as indicated by a p-value of <0.001.

Among males, the majority reported sleeping 7-8 hours (78 cases), followed by 5-6 hours (54 cases). Only a small number reported very short sleep durations of 2 hours (6 cases) or 3-4 hours (12 cases). In contrast, females predominantly reported 5-6 hours of sleep (108 cases), with fewer reporting 7-8 hours (66 cases). Notably, no female participants reported sleeping as little as 2 or 3-4 hours.

This suggests that males were more likely to get 7-8 hours of sleep on workdays compared to females, while females were more likely to experience intermediate sleep durations (5-6 hours).

The sleep duration patterns on days off also showed significant gender differences, as indicated by a p-value of <0.001:

Among males, the majority (114 cases) reported sleeping 7-9 hours. Other durations included 10-12 hours (18 cases), 4-6 hours (12 cases), and a very small number reporting 24 hours of continuous sleep (6 cases).

Female participants also predominantly reported 7-9 hours of sleep (132 cases), but other durations included 10-12 hours (12 cases) and 4-6 hours (30 cases). None of the female participants reported sleeping for 24 hours.

This indicates that on days off, both males and females tend to have longer sleep durations, with most reporting 7-9 hours. However, females were more likely to report intermediate sleep durations (4-6 hours), while a slightly higher proportion of males reported extended sleep durations (10-12 hours).

Burnout is amplified by chronic sleep deprivation, as participants in high-stress environments (e.g., clinics and government organizations) juggle professional duties while battling inadequate rest. Irregular sleep schedules, difficulty falling/staying asleep, and failure to feel well-rested lead to cognitive fatigue, decreased productivity, and emotional exhaustion—all hallmarks of burnout. Participants in dual work settings (clinics and government organizations) are particularly affected, as their workloads and stress levels are higher compared to those working solely in private clinics.

Discussion:

Burnout and sleep deprivation are widely recognized as critical occupational health concerns among healthcare professionals. This study, the first of its kind conducted in Karachi, Pakistan, highlights the significant association between sleep deprivation and burnout among medical professionals. The findings align with global research demonstrating that inadequate sleep is a key factor contributing to emotional exhaustion, depersonalization, and reduced professional efficacy (18).

Our study revealed a high prevalence of burnout and sleep deprivation among medical professionals in Karachi, consistent with international findings. Studies indicate that healthcare workers, particularly those in high-stress environments such as hospitals and emergency departments, are at an increased risk of experiencing chronic sleep deprivation and burnout(19). Sleep deprivation impairs cognitive function, decision-making, and overall job performance, which can compromise patient safety (20).

The results support existing literature that highlights sleep deprivation as a major predictor of burnout. Research supports a direct link between sleep deprivation and burnout. For example, a study found that burnout prevalence was notably higher among neuro-interventionalists who reported sleep deprivation, estimating that maladaptive sleep behaviors led to burnout rates around 50% (21). This finding is corroborated by studies identifying lack of sleep as a primary risk factor for burnout across various professional settings. For instance, research indicated that medical students suffering from sleep deprivation experienced higher instances of burnout, with disturbances in sleep quality directly associated

with poor health outcomes, including depression and anxiety (22).

First, burnout negatively influences healthcare professionals' job performance and quality of patient care. Research indicates that healthcare providers experiencing high levels of burnout are more prone to making medical errors, which poses a direct risk to patient safety(23). The correlation between high burnout levels among surgeons and an increased likelihood of major medical errors vividly illustrates this point (24). Such findings emphasize the pressing need to address burnout not only to enhance healthcare professional well-being but also to safeguard patient outcomes.

Recommendations and Future Research

Based on our findings, we recommend implementing policies that regulate work hours, promote adequate rest, and provide psychological support for healthcare workers. Hospitals and medical institutions should consider fatigue management strategies, including structured rest breaks, shift adjustments, and stress management programs(25)Future research should explore long-term interventions and their effectiveness in reducing burnout and improving sleep quality among Pakistani medical professionals.

Limitations

Despite its strengths, this study has some limitations. Using self-reported data may introduce recall bias and subjective variability in sleep duration assessment. Additionally, the cross-sectional design prevents the establishment of a causal relationship between sleep deprivation and burnout. Longitudinal studies with objective sleep-tracking methods (e.g., actigraphy or polysomnography) are recommended to validate these findings.

Conclusion

This study provides crucial insights into the high prevalence of burnout and sleep deprivation among medical professionals in Karachi, Pakistan. Given the detrimental effects on both healthcare workers and patient safety, it is imperative to implement workplace interventions aimed at improving sleep hygiene and reducing occupational stress. Addressing these issues will enhance professional well-being and ultimately lead to better healthcare outcomes.

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Dr. Saba Tabassum Khan: Concept and main idea
Dr. Syed Masood Ul Hasan: Supervising and approval for final manuscript submission
Dr. Uzair Hashmi: Data collection
Dr. Husain Nathani: Write up and final drafting
Dr. Taha Usman: Critical analysis and writeup of final manuscript