



Original Article

Sleep Quality and Its Perceived Impact on Daily Functioning Among Doctors in a Tertiary Hospital in Lahore: A Cross-Sectional Study

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ABSTRACT

Objective: To determine the prevalence of poor sleep quality, its perceived impact on daily functioning, and its association with demographic, work-related, and lifestyle factors among doctors at a tertiary care hospital in Lahore, Pakistan.

Methods: This cross-sectional analytic study was conducted from January to February 2025 among doctors of varying designations like house officers to specialties in public and private sector hospitals in Lahore. A structured, self-administered online questionnaire captured sociodemographic, work-related, and lifestyle/sleep-hygiene data. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI; global score >5 indicating poor sleep quality), alongside a 7-item scale developed for this study to measure perceived functional impact across routine, academic, professional, creative, physical, mental, and health domains. Data were analyzed in SPSS v24 using descriptive statistics, chi-square tests, and binary logistic regression.

Results: Of 136 doctors who completed the questionnaire (analytic PSQI sample, n=101), nearly one-third were classified as poor sleepers. Poorer sleep quality correlated significantly with greater self-reported impairment across all seven functioning domains, most strongly with academic performance ($p=0.416$) and general health ($p=0.409$). Functional impact scores rose by 0.67 points for each 1-point worsening in PSQI score, with sleep quality explaining approximately 15% of variance in total functional impact. A stepwise, dose-response pattern was observed across good, poor, and very poor sleep groups, with physical activity and creative thinking most negatively affected.

Conclusion: Poor sleep quality is prevalent among doctors across all seniority levels in Lahore and is consistently linked to impaired daily and professional functioning, with implications for both physician wellbeing and patient safety.

Keywords: PSQI, Sleep Quality, Stress, Workload, Health professionals, Academic performance, Mental performance, Physical activities, Creative thinking, General health.

INTRODUCTION

Sleep is a basic physiological need for recovery and maintenance of physical and cognitive well-being and disturbances in sleep quality have consequences that reach beyond being simply tired during the day.¹ While poor sleep quality has consistently been associated with impaired concentration, mood disturbance, and a decreased immune function. Higher long-term risk of cardiovascular and metabolic disease. Doctors' sleep is especially stressed out: long hours, frequent night calls, heavy workloads and conflicting priorities among clinical, academic and family matters are well known hazards of poor sleep in all doctors.^{1,2}

In contrast to many occupational groups, doctors' sleep problems don't improve with career progression. Poor sleep quality can impact all medical practitioners.^{3,4} The junior doctors undergo training and examinations, and senior's faculty who are additionally burdened with administrative, teaching and supervisory responsibilities, in addition to their clinical duties. Importantly, poor sleep is not just uncomfortable, doctors also report that it interferes with their ability to function in everyday life, such as completing daily activities, performing at work, concentrating on task, and overall health; which also has direct implication for patient safety.⁵

The current literature from Pakistan provides example of both the extent of the problem and the research gaps. Poor sleepers were more than one-third of all juniors' physicians in the city of Karachi, and the factors associated with poor sleep were female gender, excessive day time sleepiness, and reduced total sleep time according to the Pittsburgh Sleep Quality Index (PSQI) in a cross-sectional study.⁶ Likewise, a survey of medical students in Bahawalpur revealed that 61% of the participants had poor sleep hygiene, and that there was a correlation between having poor sleep hygiene and where they lived, and studying at night.^{7,8} The results indicated that sleep disturbances are prevalent at various levels of medical training and practice in Pakistan, although most of the previous studies have been conducted in under-graduates and house officers only and have neglected the study of doctors as a continuum, ranging from house officers to post-graduates to medical officers to senior faculty.⁸

As might be expected, using locally collected data reinforces the importance of knowing the prevalence in different regions almost 80% of resident physicians living in South India reported poor sleep quality; this was much higher than among Pakistani junior physicians, highlighting the influence of local training structures and duty hours, hospital sector (public versus private), and cultural expectations.⁹ Though there have been some attempts to use standardized instruments of quality of life for assessment of the healthcare workers in Pakistan, few studies have tried to correlate PSQI with a direct doctor-reported assessment of the relationship between sleep quality to the various domains of daily and professional functioning, including routine activities, academic activities, professional functioning, creative functioning, physical functioning, mental functioning, and overall health; instead of a generic QOL score.^{6,10}

As Lahore has several of the largest tertiary care and teaching hospitals, there is a high patient load with long duty and on call hours, as well as a combination of public and private sector practice, it is an important place to consider this relationship. No study has yet combined sleep quality (measured by PSQI) with perceived functional impact of sleep across all levels of doctor designation (house officers to senior faculty) in one setting, the Lahore tertiary hospital, nor investigated the association of sleep related lifestyle behaviors (use of gadgets before sleep, napping habits, duty/night shift load) with both the sleep quality and perceived functional impact of sleep in one hospital. The aim of this study, therefore, was to find out the prevalence of poor sleep quality, perceived impact of sleep on the daily functioning and association of demographic, work related and lifestyle factors in doctors of a tertiary hospital in Lahore.

METHODS

Study design and setting

The study was a cross-sectional analytic study and conducted during the period of January 2025 to February 2025 among the doctors in tertiary care hospital Lahore, Pakistan. Staff from both public and private sector hospitals were included, as the clinical practice in the city was mixed. The study population includes doctors of various designations and disciplines such as house officers, postgraduate trainees, medical officers/registrars and senior faculty in medical, surgical and allied specialties (medicine, surgery, pathology, anatomy, ENT, radiology, pediatrics, dermatology and others). Convenience sampling (using an online google form link sent to doctors). During the study period, a total of 136 doctors filled the questionnaire. Ethical approval was obtained. All participants gave informed consent before answering the questionnaire and confidentiality of their answers was ensured throughout.

Inclusion criteria: doctors in practice at the study site(s) at the time of data collection who agree to participate in the study.

Exclusion criteria: If a doctor has an existing sleep disorder diagnosis, if he or she refuses to sign the consent form, or if the responses are complete.

Study instruments:

1. A structured, self-administered online questionnaire was used to collect data in the form of a 4-part questionnaire, namely: The variables measured were sociodemographic factors such as age, gender, height, weight, marital status, hospital sector (public/private/both), qualifications, years of working experience, designation, specialty, number of jobs held, working hours per week, number of night duties per month, monthly income, job satisfaction, and number and range of children.

2. Lifestyle and sleep-hygiene factors, smoking status, medical illness, pre-sleep activities (drinking, eating, prayer), pre-sleep sleeping habits (sleeping in the same position and location, physical activity before sleep, timing of sleep, napping during the day, using electronic gadgets before sleep, and waking manner).

3. Pittsburgh Sleep Quality Index (PSQI) is a validated 19 item self-rated questionnaire to measure sleep quality over the past month according to seven components:

- Subjective sleep quality
- Sleep latency (time to fall asleep)
- Sleep duration
- Habitual sleep efficiency (percentage of time in bed asleep)
- Sleep disturbances
- Sleep medication use
- Daytime dysfunction (impairment)

The scores are added together for each components to get a global PSQI score of 0-21, where a global score > 5 signifies poor sleep quality.

4. Perceived impact of sleep quality on daily functioning - an additional 7-item scale created for the purpose of this study which asked participants to rate how their sleep quality impacts on their routine activities and their academic, professional, creative, physical, mental, and health functioning.

Participants were also invited to name freely the three most important factors, which they saw as affecting the quality of their sleep as well as the three changes which they thought would improve the quality of their sleep.

Data analysis:

Data was analyzed using SPSS version 24. Sociodemographic, work-related and lifestyle variables were described using descriptive statistics (frequency and percentages). Participants were classified as good sleepers (PSQI score < 5) and poor sleepers (PSQI score > 5) based on global cut-off score for PSQI. Association of sleep quality and categorical variables was analyzed using chi-square tests and binary logistic regression was applied to determine independent variables associated with poor sleep quality. P-values were regarded as being statistically significant at <0.05.

DISCUSSION

In this study, it was intended to find out if and how poor sleep quality would impact the day-to-day and work life of doctors in a tertiary hospital within Lahore. The study did not try to explain why sleep is poor (which has been explored in a vast amount of literature) but instead studied the effects of poor sleep, an area that has been understudied in sleep research from a doctor perspective. It was doing so that it discovered nearly one-third of the doctors who participated in the study were considered poor sleepers on the Pittsburgh Sleep Quality Index (PSQI) and that poorer sleep quality was consistently and significantly correlated with greater self-reported impairment in all seven functioning domains examined: routine activities, professional activities, academic performance, mental performance, physical activities, creative thinking and general health.¹¹

This high prevalence of poor sleep quality is fairly similar to that reported elsewhere in the region, and in some instances higher.^{9,10,12} Poor sleep quality and hygiene in sleep were also found in the studies of the junior physicians of Karachi and medical students of Bahawalpur, and in resident physicians of Damascus, the prevalence was even higher among high intensity specialties. This, combined with the current findings, gives a general sense that poor sleep does not seem to be limited to any medical training or practice phase, and is a ubiquitous phenomenon of clinical practice in resource-limited healthcare settings, regardless of career stage, from house officers to senior faculty.^{2,13}

Quality of sleep and functional consequences

The main results of this study are the high and stable correlation between sleep quality and perceived functional impact. Statistically significant positive correlations were found between the PSQI global score and all functioning domains, with the highest being between academic performance and PSQI global score ($\rho=0.416$) and health and PSQI global score ($\rho=0.409$), and comparatively weaker but still significant between mental performance and PSQI global score ($\rho=0.263$). This trend was confirmed by linear regression, which found that the composite functional impact score increased by 0.67 on average for each 1-point decrease in PSQI global score, and that sleep quality explained about 15% of the variance in total functional impact score. This does not leave a lot of variances unexplained, but it is not a trivial value for a single predictor in a multi-determined outcome like perceived functioning and is consistent with sleep quality being one of a few contributing factors to perceived functioning rather than the only one.^{14,15}

These findings were further enhanced by an additional, clinically intuitive finding from the one-way ANOVA comparison of the good, poor, and very poor sleep quality groups: functional impact scores also increased in a step-wise manner across the three sleep quality groups in each of the domains, indicating a dose-response relationship in which each incremental worsening in sleep quality corresponded to an incremental worsening in perceived disruption to daily and professional functioning rather than a simple threshold effect.¹⁶ This pattern does lend some support to the notion that modestly, not necessarily the most severely affected, intervention to improve sleep quality could plausibly lead to measurable improvements in doctors' day to day functioning.¹⁷

Domain-specific patterns

Interestingly, physical activities and creative thinking were the most negatively impacted by poor sleep quality as rated by the doctors, whereas academic performance was rated as least negatively impacted, in absolute terms, even though academic performance had one of the strongest statistical associations with the PSQI score.¹⁸ It is important to note that this can be differentiated: a domain could have a high relative score with sleep quality (i.e., it can be worse by a lot as sleep gets worse) and not necessarily the highest absolute score in the whole sample.¹⁹ Prefrontal cortical function and physical energy resources, such as physical stamina and creative or divergent thinking, are both found in the broader sleep literature to be especially vulnerable to sleep loss, because they rely heavily on these resources.²⁰ Although there is no formal psychometric validation of the functional impact scale used in this study, it is intuitively recognized by the doctors in this study.^{14,21}

Interpretation - in relation to workforce and Patient safety

In addition to its patient health and safety implications, the regular linkage between poor sleep and suboptimal professional functioning observed in this study has implications for the health system.²² If a doctor says that poor sleep predominantly or always impairs his or her activities and mental performance, then he or she is saying that he or she is most likely working below their intended capacity, and this is consistent with many other studies that have shown how sleep-deprived clinicians have slower reaction times, poorer judgement and a higher risk of clinical error.^{18,22} The results of this study are of prime importance in the Pakistani context where tertiary hospitals are subjected to great stress on staffing and resources and not only the doctors' sleep quality, but the health system quality and safety would also be affected.^{10,23}

Novelty and contribution

The existing literature in Pakistan and elsewhere on the sleep of doctors has focused on determining factors that make sleep poor such as workload, specialty, seniority, examination stress, etc.^{8,10} In contrast, the present study specifically examined consequences, how doctors feel sleep impacts their routine, professional, academic, cognitive, physical and health outcomes.^{6,24} To the best of the authors' knowledge this shift in framing is one of the first attempts, in a Pakistani tertiary care setting, to quantify this relationship directly, between all doctors (house officers and faculty) irrespective of training grade.¹⁰ This study established the sleep and functioning relationship as not being limited to trainees subjected to examination stress, but as being present throughout the entire seniority range, implying that it may be related to a more structural aspect of clinical work as a whole rather than just the examination stress of postgraduate training.²⁵

Limitations

There are a few caveats to be noted in interpreting these results. First, because of the cross-sectional design, the results of this study do not mean to suggest any causation: it is biologically and behaviorally logical to believe that poor sleep harms functioning, but equally logical to believe that the nature of a heavy workload or a health problem that affects functioning impacts sleep, and that the relationship may be bi-directional.

Second, the perceived functional impact scale used here is specific to this study and has not been formally psychometrically validated, unlike the PSQI, and must be viewed as a subjective self-report of the functional impact rather than as an objective indicator of functional impact.

Third, the analytic sample used in PSQI-based analyses was 101, rather than 136 people, due to the removal of responses that were missing or unpassable in the bedtime, wake time, and sleep duration items of the PSQI, and these losses of analytic sample size might have contributed to the prevalence and association estimates being biased if the missing responses were not random, such as if they were more common among those with erratic doctor schedules.

Fourthly, it is a single center study based on a self-administered online questionnaire, which may not be generalizable to other cities or types of hospitals or practice settings in Pakistan and has the limitations of self-report and social desirability bias. Lastly, the analysis failed to account for potential confounding factors, such as age, specialty, working hours, or hospital sector, which may account for some of the relationships between functional impact and sleep quality observed and not be exclusive to sleep alone.

Future directions

Longitudinal or diary study designs that would allow for temporal precedence between sleep disturbance and functional impairment, ideally with objective sleep measurement (actigraphy) as well as self-reported measures, are recommended for future study. To determine if the sleep and functioning relationship is independent of these work-related factors, multivariable analyses controlling for specialty, designation, working hours and hospital sector would clarify this. Finally, future studies should consider the potential utility of developing interventions specifically for certain domains, such as physical activity and creative thinking, that seem to be especially sensitive to sleep quality, or of evaluating the potential of such targeted interventions, such as a protected rest period after night duty or a structured napping policy, among doctors.

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