International Journal of Community Medicine and Public Health
Duvvuri S et al. Int J Community Med Public Health. 2026 Mar;13(3):1252-1258
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20260677

Original Research Article

Prevalence of burnout, poor sleep quality and quality of life amongst medical and surgical residents in a tertiary care institute in Puducherry

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Received: 26 November 2025
Accepted: 16 February 2026

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ABSTRACT

Background: Burnout and sleep deprivation are increasingly recognized among resident doctors in India, with implications for their well-being and the quality of care they provide. Understanding the magnitude of these issues and their determinants is essential for institutional action. This study aimed to assess the prevalence of burnout and poor sleep quality among postgraduate medical residents and to examine the associations with socio-demographic and bio-behavioral factors. Quality of life was evaluated as a secondary objective.
Methods: A cross-sectional study was conducted at JIPMER, Puducherry, among residents enrolled in MD, MS, DM, MCh, and integrated six-year postgraduate programs. After obtaining informed consent, data were collected via structured interviews using the Copenhagen Burnout Inventory, Pittsburgh Sleep Quality Index, Perceived Stress Scale, and WHO-QOL-BREF. Associations were examined using univariate and multivariable logistic regression.
Results: A total of 162 residents were randomly sampled. Burnout in at least one domain was present in 56.7% of residents, and 29% experienced burnout in two domains. Poor sleep quality was reported by 51.8%, and 84% had moderate to severe perceived stress. Female residents had higher odds of burnout (aOR=4.61). Poor sleep quality (aOR=3.14) and lower QoL scores were strongly associated with burnout, while third-year residents had 0.15 odds compared to first-years. Severe stress and poor sleep were also significantly associated with poorer QoL.
Conclusions: Burnout, poor sleep quality, and elevated stress levels are highly prevalent among residents. Addressing workloads, sleep hygiene, stress-management support, and institutional welfare mechanisms is essential to enhance resident well-being and safeguard patient care.

Keywords: Burnout, Quality of life, Perceived stress, Resident doctors, Sleep quality

INTRODUCTION

Professional and personal burnout affects a significant proportion of resident doctors in India. It has been estimated that nearly one-third of all medical residents experience burnout.[1] Burnout is particularly common among MBBS students, postgraduate residents, and early career physicians, who tend to experience more stress and work-related strain compared to the general population.[2] Burnout is a multidimensional syndrome defined by three key components: emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment.[3] Among residents, burnout is a serious concern, as it directly influences the quality of care provided to patients. It has been linked to lower levels of professionalism, increased medical errors, higher rates of suicidal ideation, and long-term consequences like cardiovascular disease.[2,4,5] Factors commonly associated with burnout include dissatisfaction with workload, strained relationships with peers and seniors, and a perceived lack of autonomy.[6] However, these factors may

vary across states due to the differing residency structures and institutional environments in medical colleges across India.

Sleep deprivation is another major concern for resident doctors. Its link with poor memory retention and decreased daytime alertness is well documented.[7] Sleep quality is a subjective metric, determined not only by the number of hours slept but also by the continuity of sleep, ease of falling asleep, and feeling of refreshment upon waking. Poor sleep quality may present as difficulty falling asleep, frequent awakenings, and inadequate sleep duration.[7] Alami et al found that poor sleep was significantly associated with decreased quality of life and higher daytime somnolence.[8] Another study assessing vigilance and performance among residents on post on-call shift noted significant impairment in reaction time compared to residents not post on-call.[9]

The 1995 WHO Position Paper defined 'quality of life (QoL)' as '*individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns*'.[10] Quality of life is influenced by a range of factors, including age, workload, burnout levels, and social support. Despite its significance, very few studies have examined the quality of life of postgraduate medical students in India. While sleep quality has been studied in undergraduates with poor outcomes consistently reported there is a lack of comprehensive research on QoL and sleep patterns in residents, who are exposed to greater clinical demands and emotional stressors.

Ratnakaran et al have shown that burnout among residents in Kerala, at 37.2%, is more prevalent in medical and surgical specialties than in pre- and para-clinical departments.[1] However, the response rate was somewhat conservative since the survey comprised self-administered questionnaires. Women and younger residents have been found to experience higher levels of burnout, while resilience may act as a protective factor.[11] Forty-five percent of junior residents were reported to have poor sleep quality as per a study conducted in Sikkim.[12] Being posted in the trauma care area was associated with a higher degree of burnout among orthopaedic residents.[13] Solis et al found that female residents scored lower on the physical and psychological domains of the WHO QoL-BREF than their male counterparts, but quality of life has not been explored in the Indian context.[14]

At institutions like JIPMER, postgraduates come from a wide variety of cultural and regional backgrounds. Their circumstances also differ some are married with children, while others live alone in hostels. Factors such as screen time, eating habits, frequency of physical activity, time spent away from home, and smartphone addiction may all influence burnout, sleep quality, and QoL.[15] These have not yet been studied holistically. Understanding these associations can inform institutional changes to improve resident well-being and, by extension, patient care. This study aimed to estimate the prevalence of burnout and poor sleep quality among academic residents in a tertiary care teaching hospital in Puducherry, along with their associations with various sociodemographic factors. Additionally, it aimed to evaluate residents' quality of life using the WHO-QoL-BREF questionnaire.

METHODS

Study design and setting

We conducted an analytical cross-sectional study on the campus of JIPMER, Puducherry a tertiary referral hospital-cum-medical college. Residents enrolled in MD, MS, DM, or MCh programs for at least six months were included. Those unreachable after two documented attempts were excluded.

Sample size and sampling

A 2016 study from Kerala reported work-related burnout in 37.2% of postgraduate residents.[1] Assuming a 5% alpha, 20% relative precision, the calculated sample size was 163. Allowing for a 10% non-response rate, the final sample size was 180. Simple random sampling was done from a line list of all eligible medical residents enrolled for at least six months at the time of data collection.

Ethical approval and funding

Ethical clearance was obtained from the Institute Ethics Committee (IEC-OS/2022/301). Written, informed, witnessed consent was secured from all participants. The authors received no financial support for the research, authorship, and/or publication of this article.

Procedure

Participants were provided a Participant Information Sheet and consented via a written Informed Consent Form. Identifying markers were removed prior to data collection, and strict confidentiality was ensured. Data were collected through face-to-face interviews conducted by a single trained student investigator to minimize non-response and inter-observer variation. Data were entered into MS Excel after anonymization.

Assessment tools

The Copenhagen Burnout Inventory (CBI) (1981) was used to assess burnout in personal, work-related, and patient-related contexts. CBI was deemed adequate for determining burnout prevalence, compared to the more popular Maslach Burnout Inventory (MBI), due to similar psychometric properties.[1,16,17] As per the MBI, higher mean values were associated with greater experienced burnout in the 'Emotional exhaustion' and 'Depersonalization' scales and, inversely, in the 'Personal

accomplishment' scales. However, in the CBI, for all three components, the higher the mean value, the higher the experienced burnout.

The Pittsburgh Sleep Quality Index (PSQI) (1988), with 89.6% sensitivity and 86.5% specificity, was used to assess sleep quality; scores greater than 5 indicated poor sleep quality.[18]

The Perceived Stress Scale (PSS) (1983) categorized stress as mild (0-13), moderate (14-26), and severe (27-40).[19] The Smartphone Addiction Scale-Short Version (SAS-VQ) (2013) was used, with cut-offs of 31 for males and 33 for females.[20] WHO-QoL BREF assessed quality of life; scores less than 60 were considered poor.[10]

Data analysis

Data was analyzed using MS Excel and Stata version 12. Continuous variables were summarized using means with standard deviations or medians with interquartile ranges. Categorical variables were expressed as proportions. Associations were measured using unadjusted odds ratios (ORs) with 95% confidence intervals (CIs) from univariate logistic regression. All variables with p<0.2 in univariate analysis were included in a multivariable logistic regression model using stepwise backward elimination to derive adjusted ORs. A p-value <0.05 was considered statistically significant.

RESULTS

Out of 180 residents approached, 162 participated in the study, yielding a response rate of 90%. Based on our classification, participants included 17 (10.6%) pre-clinical and para-clinical, 97 (59.9%) clinical non-surgical, and 48 (29.5%) surgical residents. The highest representation was from the departments of General Medicine and Obstetrics and Gynaecology, with 15 participants each. Nearly half the participants were in the third year of their residency, and 46 (28.4%) reported being married. Other socio-demographic details are represented in Table 1. Personal burnout was observed in 44.4% of residents, while work-related burnout was observed in 38.9% (Table 2).

Personal burnout was more prevalent among women (p<0.001) and was positively associated with moderate to severe perceived stress, as measured by the PSS (p<0.035 and p<0.002, respectively). It was also more prevalent in those with poor sleep quality (p<0.008).

Work-related burnout was higher among residents aged 30 or older (p=0.055), higher in clinical departments (p=0.032), and increased in the second and third years of residency (p=0.035 and p=0.004). It was also found to be significant among married residents (p=0.009), those with moderate to severe perceived stress (p=0.009 and p=0.002, respectively), and was positively associated with poor sleep quality (p=0.019).

Perceived stress was moderate to severe in 84% of residents. Further analysis revealed that burnout was present in 56.7% of residents in at least one domain, 29% in any two domains, and 4.32% in all three domains. Poor sleep quality was observed in 51.8% of residents and was associated with moderate perceived stress (p-value= 0.002). Poor quality of life, as measured by the WHO-QoL-BREF questionnaire, was higher among second-year residents (p=0.045) and third-year residents (p=0.034). It was found to be significantly associated with those having severe PSS scores (p<0.001) and poor sleep quality (p<0.011). Table 3 presents the regression analysis of factors associated with burnout among the resident doctors. Variables such as age, department/specialty, marital status, and alcohol use were excluded from the multivariable model because their p-values were greater than 0.02 in the univariable analysis. Female residents had significantly higher odds of experiencing burnout than males (aOR=1.87, p=0.001). Third-year residents had lower odds of burnout than first-year residents (aOR=0.73, p=0.008). Residents who did not speak Tamil had significantly lower odds of burnout (aOR=0.70, p<0.001). Moderate perceived stress was associated with an increased risk of burnout (OR=1.33, p=0.04). Poor sleep quality was strongly associated with burnout (aOR=1.92, p<0.001). Quality of life also played a crucial role- residents in the "Very Good" category (aOR=0.73, p<0.006) had significantly lower odds of burnout than those with “neither poor nor good” quality of life.

Table 1: Socio-demographic details of participants in the study (n=162).

Variables		N (%)
Age [Mean (SD)]		27.6 (3.1)
Males		87 (53.7)
Monthly family income[#] [Median (IQR)]		195000 (150000)
Specialty	Pre-clinical	5 (3.1)
	Para-clinical specialties	12 (7.5)
	Clinical non-surgical	97 (59.9)
	Surgical	48 (29.5)
Year of study of the course	First	25 (15.4)
	Second	62 (38.3)
	Third	75 (46.3)

Continued.

Variables		N (%)
Currently married		46 (28.4)
Native state	States of South India*	130 (80.2)
	Other states of India	32 (19.8)
Living situation	Hosteller	36 (22.2)
	Day scholar	126 (78.8)
Can understand spoken Tamil		155 (95.7)
Can converse in Tamil		144 (88.9)
Currently using tobacco		12 (7.4)
Currently using alcohol		43 (26.5)
Diagnosed mood disorder present#		7 (4.32)

Note: *Tamil Nadu, Kerala, Puducherry, Karnataka, Andhra Pradesh, and Telangana are included in southern India #Self-reported.

Table 2: Prevalence of burnout, perceived stress, and poor quality of life among study participants (n=162).

Variable	N (%)
Burnout	
Burnout across domains	
Personal burnout	72 (44.4)
Work-related burnout	63 (38.9)
Patient-related burnout	11 (6.8)
Number of domains in which burnout is present	
Burnout present in any one domain	92 (56.7)
Burnout present in at least two domains	47 (29.0)
Burnout present in all three domains	7 (4.32)
Perceived stress	
Mild (0-13)	25 (15.4)
Moderate (14-26)	122 (75.3)
Severe (27-40)	15 (9.25)
Smartphone Addiction Present (SAS-VQ)	1 (25.9)
Poor Sleep Quality (PSQI >=5)	84 (51.8)
Quality of Life (WHO-QOL-BREF) [mean (SD)]	
Total score (100)	67 (9.9)
Physical domain (20)	15.3 (2.18)
Psychological domain (20)	13.7 (2.2)
Social relationships domain (20)	14.9 (2.4)
Environment domain (20)	14.9 (1.7)
Overall quality of life score (on a Likert scale of 1-5)	3.46±0.88
Overall health satisfaction score (on a Likert scale of 1-5)	3.03±1.02

Table 3: Factors associated with burnout among resident doctors in a tertiary care teaching hospital in Puducherry (n=162).

Variables	Categories	Burnout absent, N (%)	Burnout in any domain, N (%)	OR (95% CI)	P value	aOR (95% CI)	P value
Gender	Male (n=87)	48 (55.2)	39 (44.8)	(Reference)		(Reference)	
	Female (n=75)	22 (29.3)	53 (70.7)	2.96 (1.54-5.69)	0.001	1.87 (1.38-2.54)	0.001
Year of study of course	First (25)	4 (16)	21 (84)	(Reference)		(Reference)	
	Second (62)	27 (43.6)	35 (56.4)	4.05 (1.24-13.20)	0.025	0.93 (0.72-1.21)	0.578
	Third (75)	39 (52)	36 (48)	5.69 (1.78-18.17)	0.002	0.73 (0.56-0.96)	0.024
Native state	Southern India (130)	60 (46.2)	70 (53.8)	(Reference)		(Reference)	
	Other parts of	10 (31.25)	22 (68.75)	1.88 (0.83-4.29)	0.131	0.83 (0.65-1.08)	0.158

Continued.

Variables	Categories	Burnout absent, N (%)	Burnout in any domain, N (%)	OR (95% CI)	P value	aOR (95% CI)	P value
	India (32)						
Speaks Tamil	Yes (18)	2 (11.1)	16 (88.9)	(Reference)		(Reference)	
	No (144)	68 (47.2)	76 (52.8)	0.14 (0.03–0.63)	0.004	0.70 (0.58-0.87)	0.000
Tobacco use	No (150)	62 (41.3)	88 (58.67)	(Reference)		(Reference)	
	Yes (12)	8 (66.7)	4 (33.3)	2.84 (0.82-9.84)	0.129	0.84 (0.65-1.08)	0.190
Diagnosed mood disorder	No (155)	69 (44.5)	86 (55.5)	(Reference)		(Reference)	
	Yes (7)	1 (14.3)	6 (85.7)	0.21 (0.02-1.77)	0.141	1.13 (0.96-1.33)	0.138
Perceived stress	Mild (25)	20 (80)	5 (20)	(Reference)		(Reference)	
	Moderate (122)	50 (41.0)	72 (59.0)	5.76 (2.03-16.36)	0.001	1.33 (1.01-1.71)	0.040
	Severe (15)	0 (0)	15 (100)	NA		1.33 (1.01-1.71)	0.040
Smartphone addiction	No (120)	57 (47.5)	63 (52.5)	(Reference)		(Reference)	
	Yes (42)	13 (31.0)	29 (69.0)	2.02 (0.95-4.25)	0.065	1.25 (0.94-1.67)	0.154
Sleep quality	Normal (78)	47 (60.2)	31 (39.8)	(Reference)		(Reference)	
	Poor (84)	23 (27.4)	61 (72.6)	4.02 (2.07-7.78)	<0.001	1.92 (1.45-2.57)	0.000
Quality of life category (WHO-QOL-BREF)	Very poor (3)	0 (0)	3 (100)	0.34 (0.02-7.16)	0.551	1.07 (1.00-1.17)	0.092
	Poor (24)	5 (20.8)	19 (79.1)	0.65 (0.19-2.16)	0.561	1.26 (0.97-1.60)	0.074
	Neither poor nor good (38)	11 (28.9)	27 (71.1)	(Reference)		(Reference)	
	Good (88)	46 (52.3)	42 (47.7)	2.69 (1.19-6.08)	0.019	0.76 (0.57-1.00)	0.062
	Very good (9)	8 (88.9)	1 (11.1)	19.64 (2.19-176.15)	0.002	0.73 (0.59-0.91)	0.006
Health Satisfaction (WHO-QOL-BREF)	Very dissatisfied (14)	0 (0)	14 (100)	0.04 (0.00-0.75)	0.001	1.46 (1.23-1.70)	0.000
	Dissatisfied (34)	11 (32.4)	23 (67.6)	0.59 (0.24-1.46)	0.266	1.09 (0.84-1.43)	0.498
	Neither satisfied nor dissatisfied (49)	22 (44.9)	27 (55.1)	(Reference)		(Reference)	
	Satisfied (61)	35 (57.4)	26 (42.6)	1.65 (0.77-3.53)	0.250	0.81 (0.60-1.10)	0.172
	Very satisfied (4)	2 (50)	2 (50)	1.23 (0.16-9.43)	1.000	0.98 (0.84-1.13)	0.914

DISCUSSION

Among the medical residents enrolled in the postgraduate programmes at this tertiary referral hospital and medical college, the prevalence of burnout was notably high at 56.7%. This could be due to long work hours, skipped meals, and poor sleep quality, as previous results have indicated.[2,4,6,7] Poor sleep quality and its causes need further analysis, as described below. However, improving sleep quality could significantly reduce burnout and thereby improve patient outcomes.

Furthermore, our findings align with Shanafelt's, indicating that trauma surgeons, vascular surgeons, and surgeons are more likely to experience higher levels of burnout.[21] We also concur with Galaiya et al, who found that women are more vulnerable to this condition (aOR=4.61, p-value=0.001).[22] They also reported mixed outcomes on the relationship between training level and burnout levels.[11] However, our findings clearly showed that third-year residents had decisively lower odds of burnout than first-year residents (aOR=0.15, p-value=0.008).

Interestingly, we found that residents who did not speak Tamil, regardless of their place of origin, had significantly lower odds of burnout (aOR=0.11, p-value=0.024). Studies have shown that interactions with distrustful and uncooperative patients, as well as those with unrealistic expectations, are significant causes of burnout.[6] Hence, we posit that the language barrier may have acted as a protective factor from patient-related burnout.

In contrast, residents with high perceived stress had 2.5 times the odds of being burnt out, demonstrating that perceptions of working hours and workload were key decisive factors, over and above other tangible factors such as department, marital status, tobacco/alcohol use, etc. This highlights the role of coping strategies, which this study does not assess, but which may influence burnout levels. Howlett et al postulated that emotion-related coping was negatively associated with burnout, and task-related coping was positively associated with burnout.[23] It has been previously established that those who seek professional help for better coping strategies have lower levels of emotional exhaustion than those who do not.

Stress-reduction measures, such as group discussions and cognitive-behavioural therapy, are well-documented methods to protect against emotional exhaustion and personal burnout.[6,24] However, patient-related burnout was reported only in 6.8% of residents (with insignificant differences between clinical and paraclinical departments). Hence, the significant association between perceived stress and burnout is likely due to the strongly positive associations between perceived stress and patient- and work-related burnout. To effectively address both of these, we recommend comprehensively assessing factors like work hours, workload, and doctor-to-patient ratio accordingly reorienting the workflow.

Sleep quality was poor in 51.8% of residents and was associated with a significant difference in nativity from other states in India and a lower understanding of spoken Tamil. Since work- and patient-related burnout are positively associated with knowledge of spoken Tamil, it is essential to implement measures to identify the exact cause of distress and investigate possible workplace discrimination due to nativity. Based on further analysis, poor sleep quality was found to be significantly associated with smartphone addiction, moderate perceived stress, and burnout. It has been found that smartphone addiction is associated with poor sleep quality but not vice versa. Likewise, an association was found between smartphone addiction and perceived stress, thus bringing us to the conclusion that smartphone addiction is perhaps a coping strategy for stress and sleeplessness.[7] However, the association between poor sleep quality and burnout could be due to one or the other.[7]

Eating habits and physical activity were found to have insignificant associations, in contrast to previous studies.[7]

It is well known that each person works best according to their circadian rhythm. Deviation from this time of peak performance can lead to decreased attention span and alertness, as well as prolonged sleep debt.[25,26] Hence, a thorough investigation of factors such as non-availability of comfortable duty resident rooms on shifts, heavy workload, back-to-back duties, and irregular schedules may be required to improve sleep quality.

In our study, we also found that poor quality of life was significantly associated with poor sleep quality, severe perceived stress, older age (>30 years), and with the second and third years of residency compared to the first year. Previous studies have also established a positive association between quality of life and burnout.[1] It is commonly known that the second and third years of residency are associated with more responsibility for patient care, greater accountability, and more academic pressure due to thesis preparation and approaching exams. A study into how the work schedule may be altered to accommodate growing responsibilities would improve health.

It has been established that increased burnout, poor sleep quality, and a poor quality of life are closely linked. Efforts to improve one of these domains will improve the others.

A limitation of our study lies in the cross-sectional nature of the study, which precludes causal inference, and the self-reported nature of much of the data. Further, we are limited by the reliability of the tool used to assess sleep quality - the PSQI is not well-suited to evaluate sleep quality amongst physicians, since some residents are unable to provide the accurate time of waking up, sleeping, and the average number of hours of sleep, due to the irregularity of sleeping hours in clinical residents. Thus, there is a need to develop a more suitable instrument, which may have higher reliability than self-reported questionnaires. A more precise, quantitative assessment of sleep duration, patterns, and recovery time would enable better planning for residency programmes.

CONCLUSION

A significant proportion of residents appear to be experiencing personal burnout. While the underlying causes warrant further investigation, identifying associated modifiable factors presents an opportunity to develop targeted interventions that support resident well-being. Notably, 84% of residents reported moderate to severe levels of perceived stress. Further, reduced sleep quality was another prominent finding, underscoring the need to evaluate contributory factors such as duty schedules and workload distribution.

This highlights the urgent need for structured institutional support, including the appointment of dedicated Welfare Officers and the provision of protected time for rest and recovery. Further, regular mental health assessments, equitable task allocation, supportive supervisory systems, and improvements in rest infrastructure are critical. These measures are not only necessary to enhance the training environment but also crucial in safeguarding the quality of patient care. Addressing burnout, sleep deprivation, and stress among residents is not optional it is essential for a resilient and responsive health system.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Duvvuri S, Khaitan A, Gola A, Menon V, Roy G. Prevalence of burnout, poor sleep quality and quality of life amongst medical and surgical residents in a tertiary care institute in Puducherry. Int J Community Med Public Health 2026;13:1252-8.