

Resilience, Coping Abilities, and Their Association with Sleep Quality and Perceived Stress among Nurses in a Tertiary Care Hospital in Nagpur: A Cross-Sectional Study

V. Komathi¹, J. Mahathi², Dhivya P³, Ritika⁴, Sweta Mittal⁵,
Navya Saini⁶, Bhawana Mahala⁷, Pragati Kumawat⁸

^{1,2,3}Nursing Tutor, College of Nursing, All India Institute of Medical Sciences (AIIMS), Nagpur, Maharashtra, India

^{4,5,6,7,8}Fourth-year BSc (Hons) Nursing students, College of Nursing, All India Institute of Medical Sciences (AIIMS), Nagpur, Maharashtra, India

Abstract

Background: Nurses in tertiary care hospitals work in demanding environments characterized by high patient acuity, workload, shift duties, and emotional demands. Sleep disturbance and perceived stress may adversely affect well-being, while resilience and coping strategies may influence how nurses respond to occupational stress.

Objective: To assess resilience, coping abilities, sleep quality, and perceived stress among nurses and determine their associations with one another and with selected demographic and work-related characteristics.

Methods: A quantitative cross-sectional descriptive-correlational study was conducted among 123 registered nurses at AIIMS Nagpur between June and December 2025. Participants were selected using non-probability proportionate quota sampling from outpatient departments, wards, and special areas. Data were collected electronically using the Pittsburgh Sleep Quality Index (PSQI), Perceived Stress Scale-10 (PSS-10), Brief Resilience Scale (BRS), and Brief COPE. Data were analysed in Jamovi version 2.6. Spearman rank correlation, Mann–Whitney U, and Kruskal–Wallis tests were used after assessment of normality with the Shapiro–Wilk test.

Results: 70 nurses (56.9%) had poor sleep quality (PSQI >5); the median PSQI score was 6 (IQR 2). The median PSS-10 score was 18 (IQR 5.5). Mean BRS score was 3.21 (SD 0.49). Resilience was moderately and inversely correlated with perceived stress ($\rho=-0.483$, $p<0.001$), but was not significantly correlated with PSQI score ($\rho=0.017$, $p=0.849$). Emotion-focused coping was positively correlated with PSQI score ($\rho=0.263$, $p=0.003$), whereas problem-focused and avoidant coping were not significantly correlated with PSQI score. Problem-focused coping was inversely correlated with perceived stress ($\rho=-0.219$, $p=0.015$), while avoidant ($\rho=0.324$, $p<0.001$) and emotion-focused coping ($\rho=0.179$, $p=0.048$) were positively correlated with perceived stress. Sleep quality differed significantly by self-reported physical illness ($U=267$, $p=0.046$), while no significant associations were observed between perceived stress and the demographic/work-related variables examined.

Conclusion: Among nurses in this tertiary care setting, poor sleep quality was common. Higher resilience was associated with lower perceived stress, while coping styles showed domain-specific relationships with stress and sleep. Institutional strategies that strengthen resilience and adaptive coping, alongside attention to sleep health and physical well-being, may be beneficial.

Keywords: nurses; resilience; coping; sleep quality

Introduction

Nurses working in tertiary care hospitals are exposed to high patient acuity, demanding workloads, shift duties, frequent clinical decision-making, and emotionally challenging encounters. These occupational demands can affect sleep and perceived stress and may have implications for nurses' well-being and professional functioning. Recent evidence has reported a substantial burden of poor sleep among nurses, particularly those working in high-acuity settings. A 2025 systematic review and meta-analysis of critical care nurses reported a pooled prevalence of poor sleep quality of 69.2% [1]. Other studies have linked sleep quality with stress, anxiety, and psychological outcomes among nurses [2,3]

Resilience refers to the capacity to recover or bounce back from stress and adversity. Evidence from nursing populations suggests that resilience may act as a protective psychological resource. Studies among nurses and other healthcare professionals have linked resilience with sleep, perceived stress, and occupational well-being [4–9]. Coping strategies may also influence how occupational stress is experienced. Studies examining coping and sleep or stress have identified potentially important roles for problem-solving and avoidance-related coping patterns [10–12], while other nursing research has examined coping strategies in relation to stress and resilience [5,12].

Despite growing international evidence, the dissertation identified a need for evidence from Indian tertiary care settings, where staffing patterns, workload, shift systems, organizational support, and sociocultural context may differ from other settings. The present study therefore examined resilience, coping abilities, sleep quality, and perceived stress among nurses working in a tertiary care hospital in Nagpur and assessed their associations with selected demographic and work-related characteristics.

Objectives

To determine the association between resilience and sleep quality among nurses.

To determine the association between resilience and perceived stress among nurses.

To determine the association between coping abilities and sleep quality among nurses.

To determine the association between coping abilities and perceived stress among nurses.

To determine the association between sleep quality and selected demographic variables.

To determine the association between perceived stress and selected demographic variables.

Methods

Study design and setting

A quantitative cross-sectional descriptive-correlational design was used. The study was conducted at the All India Institute of Medical Sciences (AIIMS), Nagpur, a tertiary care teaching hospital in Maharashtra, India. Data collection was undertaken from June to December 2025 across outpatient departments, general wards, and special areas including intensive care and emergency-related units.

Participants and sampling

The accessible population comprised registered nurses working at AIIMS Nagpur. Eligible participants were full-time registered nurses with at least one year of clinical experience who were willing to participate and provide informed consent. Nurses on extended leave and those working exclusively in administrative or teaching roles without direct patient care were excluded.

The hospital nursing population was reported as 630. A final sample of 123 nurses was determined using a sample-size calculation based on a correlation coefficient, 95% confidence level, 80% power, finite population correction, and a 10% non-response allowance. Non-probability proportionate quota sampling was used to represent nurses from OPD, wards, and special areas according to their distribution in the hospital. The planned allocation was 15 nurses from OPD, 49 from wards, and 59 from special areas.

Measures

Data were collected using a structured self-administered electronic questionnaire comprising a sociodemographic proforma and four standardized instruments:

Pittsburgh Sleep Quality Index (PSQI). The PSQI assesses subjective sleep quality and sleep disturbances over the preceding month. It contains 19 self-rated items generating seven component scores and a global score from 0 to 21; higher scores indicate poorer sleep quality. A global score >5 was classified as poor sleep quality in the present study [13].

Perceived Stress Scale-10 (PSS-10). The PSS-10 measures the extent to which situations are appraised as stressful over the preceding month. Scores range from 0 to 40, with higher scores indicating greater perceived stress[14].

Brief Resilience Scale (BRS). The six-item BRS measures the ability to recover or bounce back from stress. Items are rated on a five-point Likert scale and scored as an average after reverse-coding negatively worded items; higher scores indicate greater resilience[15].

Brief COPE. The 28-item Brief COPE assesses coping responses. In this study, coping was grouped into problem-focused, avoidant, and emotion-focused domains, with higher scores indicating greater use of the respective coping strategies[16].

Data collection procedure

Each investigator was assigned specific departments and shifts. Nurses were approached during duty hours, the study purpose and procedures were explained, and written informed consent was obtained. Participants accessed the electronic questionnaire through a QR code and completed it at their convenience. Completion required approximately 15–20 minutes. No personal identifiers were recorded on the data-collection form.

Ethical considerations

Ethical approval was obtained from the Institutional Ethics Committee of AIIMS Nagpur (Approval No. 1193). Written informed consent was obtained from all participants after explanation of the study purpose, procedures, potential benefits, and minimal risks. Participation was voluntary, participants could withdraw without penalty, and confidentiality and anonymity were maintained. The dissertation states that the study adhered to the ethical principles of the Declaration of Helsinki.

Statistical analysis

Data were cleaned and coded and analysed using Jamovi version 2.6. Distributional assumptions were assessed using the Shapiro–Wilk test. Descriptive statistics included frequencies, percentages, means, standard deviations, medians, and interquartile ranges as appropriate. Spearman’s rank correlation was used to examine associations between continuous study variables. For Spearman correlations, 95% confidence intervals were estimated using a percentile bootstrap procedure with [5, 000] resamples. Mann–Whitney U tests were used for comparisons involving two independent groups, and Kruskal–Wallis tests were used for comparisons involving more than two groups. Statistical significance was set at $p < 0.05$.

Results

Participant characteristics

A total of 123 nurses were included. Most participants were aged 27–30 years (73, 59.3%), were female (94, 76.4%), and were unmarried (73, 59.3%). Most were nursing officers (103, 83.7%), worked in special areas (59, 48.0%) or wards (49, 39.8%), and performed shift-wise duty (97, 78.9%). Nearly all participants had a BSc qualification (120, 97.6%). Self-reported physical illness was present in 8 participants (6.5%).

Table 1. Sociodemographic and Work-Related Characteristics of Participants (N = 123)

Variable	Category	n	%
Age, years	24–26	36	29.3
	27–30	73	59.3
	31–33	12	9.8
	34–36	2	1.6
Gender	Female	94	76.4
	Male	29	23.6
Marital status	Unmarried	73	59.3
	Married	50	40.7
Designation	Nursing officer	103	83.7
	Senior nursing officer	20	16.3
Workplace	Special areas	59	48.0
	Ward	49	39.8
	Outpatient department	15	12.2
Work shift	Shift-wise	97	78.9
	General shift	26	21.1
Education	Bachelor of Science (BSc)	120	97.6
	Master of Science (MSc)	3	2.4
Physical illness	Yes	8	6.5
	No	115	93.5

Sleep quality, perceived stress, resilience and coping

Poor sleep quality was reported by 70 nurses (56.9%), while 53 (43.1%) had PSQI scores ≤ 5 . The overall median PSQI score was 6 (IQR 2). The median PSS-10 score was 18 (IQR 5.5; observed range 7–35). For descriptive presentation, the dissertation divided PSS-10 scores at the sample median: 67 (54.5%) had scores ≤ 18 and 56 (45.5%) had scores > 18 . This median split should not be interpreted as a validated severity classification.

The mean BRS score was 3.21 (SD 0.49). For sample-based descriptive categorization, 67 (54.5%) scored at or below the sample mean and 56 (45.5%) scored above it. Problem-focused coping had a median of 2.50 (IQR 0.625); avoidant coping had a mean of 1.87 (SD 0.362); and emotion-focused coping had a mean of 2.15 (SD 0.438).

Table 2. Distribution of the Principal Study Variables (N = 123)

Measure	Statistic/category	Result
Pittsburgh Sleep Quality Index	Median (IQR)	6 (2)
Pittsburgh Sleep Quality Index	Good sleep quality, ≤ 5	53 (43.1%)
Pittsburgh Sleep Quality Index	Poor sleep quality, > 5	70 (56.9%)
Perceived Stress Scale-10	Median (IQR)	18 (5.5)
Perceived Stress Scale-10	$\leq$ sample median (≤ 18)	67 (54.5%)
Perceived Stress Scale-10	$>$ sample median (> 18)	56 (45.5%)
Brief Resilience Scale	Mean (SD)	3.21 (0.49)
Problem-focused coping	Median (IQR)	2.50 (0.625)
Avoidant coping	Mean (SD)	1.87 (0.362)
Emotion-focused coping	Mean (SD)	2.15 (0.438)

Associations among resilience, coping, sleep quality and perceived stress

Table 3. Spearman Rank Correlations Among Principal Study Variables

Variable pair	Spearman ρ	95% CI	p	Interpretation
Resilience vs. Pittsburgh Sleep Quality Index	0.017	−0.155 to 0.196	0.849	Not significant
Resilience vs. Perceived Stress Scale-10	−0.483	−0.607 to −0.340	< 0.00000002	Significant inverse association
Problem-focused coping vs. Pittsburgh Sleep Quality Index	0.165	−0.018 to 0.347	0.068	Not significant
Avoidant coping vs. Pittsburgh Sleep Quality Index	0.065	−0.130 to 0.260	0.475	Not significant
Emotion-focused coping vs. Pittsburgh Sleep Quality Index	0.263	0.094 to 0.417	0.003	Significant positive association with poorer sleep quality

Variable pair	Spearman ρ	95% CI	p	Interpretation
Problem-focused coping vs. Perceived Stress Scale-10	-0.219	-0.383 to -0.046	0.015	Significant inverse association
Avoidant coping vs. Perceived Stress Scale-10	0.324	0.145 to 0.488	0.00026	Significant positive association
Emotion-focused coping vs. Perceived Stress Scale-10	0.179	0.011 to 0.341	0.048	Significant positive association

The correlation between resilience and PSQI score was negligible and not statistically significant (Spearman's $\rho = 0.[017, 95]\%$ CI: -0.155 to 0.196 , $p = 0.849$). In contrast, resilience showed a moderate inverse association with perceived stress ($\rho = -0.[483, 95]\%$ CI: -0.607 to -0.340 , $p < 0.001$), indicating that higher resilience scores were associated with lower perceived stress. Among the coping domains, emotion-focused coping was positively associated with PSQI score ($\rho = 0.[263, 95]\%$ CI: 0.094 to 0.417 , $p = 0.003$), indicating that greater use of emotion-focused coping was associated with poorer sleep quality. Problem-focused coping was inversely associated with perceived stress ($\rho = -0.[219, 95]\%$ CI: -0.383 to -0.046 , $p = 0.015$), whereas avoidant coping ($\rho = 0.[324, 95]\%$ CI: 0.145 to 0.488 , $p < 0.001$) and emotion-focused coping ($\rho = 0.[179, 95]\%$ CI: 0.011 to 0.341 , $p = 0.048$) were positively associated with perceived stress.

Associations with demographic and work-related characteristics

Sleep quality was not significantly associated with gender ($U=1264$, $p=0.551$), marital status ($U=1795$, $p=0.876$), designation ($U=1006$, $p=0.871$), work shift ($U=1212$, $p=0.759$), educational qualification ($U=169$, $p=0.855$), workplace area ($\chi^2=0.0128$, $df=2$, $p=0.994$), years of experience ($\chi^2=2.55$, $df=3$, $p=0.466$), or age ($\rho=0.004$, $p=0.962$). Physical illness was significantly associated with poorer sleep quality: participants reporting physical illness had a median PSQI score of 9 (IQR 4.5) compared with 6 (IQR 2) among those without reported physical illness ($U=267$, $p=0.046$).

Perceived stress was not significantly associated with gender ($U=1262$, $p=0.547$), marital status ($U=1815$, $p=0.959$), designation ($U=999$, $p=0.834$), work shift ($U=970$, $p=0.070$), educational qualification ($U=170$, $p=0.876$), physical illness ($U=358$, $p=0.293$), workplace area ($\chi^2=1.0502$, $df=2$, $p=0.592$), years of experience ($\chi^2=3.84$, $df=3$, $p=0.279$), or age ($\rho=0.082$, $p=0.367$).

Discussion

The principal finding was that 56.9% of nurses had poor sleep quality, with a median PSQI score of 6. This burden is consistent with the broader nursing literature. The dissertation cites a 2025 meta-analysis reporting pooled poor sleep quality of 69.2% among critical care nurses¹, while earlier studies have also reported a substantial burden of poor sleep among nurses[7,8]. Differences in prevalence may reflect variation in clinical setting, work patterns, participant characteristics, and measurement context. The present finding nevertheless indicates that sleep health warrants attention among nurses in tertiary care environments.

Resilience was not significantly associated with PSQI score in this sample ($p=0.017$, $p=0.849$). This finding differs from studies in which resilience was associated with sleep quality among nurses, including research among newly employed nurses and ICU nurses[4,6]. The absence of a measurable cross-sectional association in the present sample suggests that resilience alone may not account for sleep quality, which may also be influenced by shift timing, physical health, workload, environmental conditions, and other unmeasured factors. Because these factors were not comprehensively measured, causal explanations cannot be drawn.

In contrast, resilience showed a clear inverse association with perceived stress ($p=-0.483$, $p<0.001$). This finding is consistent with previous research reporting inverse relationships between resilience and perceived stress among nurses and healthcare professionals[6–9]. Resilience may therefore represent a relevant psychological resource for stress management in tertiary care nursing. However, the cross-sectional design does not establish whether higher resilience reduces stress, whether lower stress facilitates resilience, or whether both are influenced by other factors.

Coping patterns showed domain-specific relationships with the outcomes. Problem-focused coping was associated with lower perceived stress, whereas avoidant and emotion-focused coping were associated with higher perceived stress. Greater use of emotion-focused coping was also associated with poorer sleep quality. These findings are broadly compatible with previous work indicating that coping strategies can influence the relationship between stress and sleep, although the direction and classification of coping strategies can vary across instruments and populations[10–12]. Importantly, the present findings should not be interpreted to mean that all emotion-focused coping is maladaptive; the Brief COPE contains heterogeneous coping responses, and the dissertation grouped domains for analysis.

Self-reported physical illness was the only demographic/health characteristic significantly associated with sleep quality. Participants reporting physical illness had higher median PSQI scores than those without reported illness. This finding is clinically plausible but should be interpreted cautiously because the study did not characterize the type, severity, duration, or treatment of physical illnesses. No demographic or work-related variable was significantly associated with perceived stress, although the comparison by work shift approached but did not reach statistical significance ($p=0.070$).

From a nursing-service perspective, the findings support consideration of resilience-building and coping-skills interventions alongside organizational approaches to sleep health. The dissertation recommends resilience and stress-management programmes, continuing nursing education on adaptive coping, attention to staffing and shift scheduling, sleep-hygiene education, and strengthened counselling and mental-health support. Such interventions should ideally be evaluated using longitudinal or experimental designs rather than inferred from cross-sectional associations.

Strengths and limitations

Strengths include assessment of four relevant psychological and occupational-health constructs using established instruments, representation of nurses from OPD, wards, and special areas through proportionate quota sampling, and use of non-parametric analyses after formal assessment of normality. The sample was drawn from a single tertiary care hospital and used non-probability sampling, which limits generalisability.

The sample was predominantly young, female, and BSc-qualified, with limited representation of older nurses.

Data were self-reported and may be affected by response or recall bias.

Questionnaires were completed during or around duty hours, and participant fatigue may have affected responses.

Several variables were non-normally distributed, requiring non-parametric analysis and limiting the range of statistical modelling undertaken.

Workplace exposures such as objective workload, staffing ratios, and detailed shift characteristics were not directly measured.

The cross-sectional design prevents determination of temporal or causal relationships.

Conclusion

Poor sleep quality was common among nurses working in this tertiary care hospital. Higher resilience was associated with lower perceived stress but was not significantly associated with sleep quality. Coping strategies showed differential associations: problem-focused coping was associated with lower perceived stress, whereas avoidant and emotion-focused coping were associated with higher perceived stress; emotion-focused coping was also associated with poorer sleep quality. Physical illness was associated with poorer sleep quality, while the other demographic and work-related characteristics examined were not significantly associated with sleep or perceived stress. These findings support integrated approaches that address resilience, adaptive coping, sleep health, and nurses' physical and occupational well-being.

Implications For Nursing Practice

Consider periodic screening for sleep problems and perceived stress among nursing staff.

Integrate resilience-building, problem-solving, and adaptive coping skills into continuing nursing education.

Strengthen access to counselling and mental-health support within healthcare institutions.

Promote evidence-informed shift scheduling, adequate rest between shifts, and adequate staffing.

Include sleep-hygiene education and practical self-care strategies in staff-wellness initiatives.

Declarations

Ethics approval: Approved by the Institutional Ethics Committee of AIIMS Nagpur, Approval No.1193.

Consent to participate: Written informed consent was obtained from all participants.

Funding: No external funding was received for this study.

Competing interests: The authors declare that they have no competing interests.

Data availability: The data generated and/or analyzed during this study are available from the corresponding author on reasonable request. Data will be shared only in a de-identified form to ensure the confidentiality and privacy of participants and will not include any information that could reveal participant identity.

Author contributions: The student authors contributed to the development and preparation of the research project, participant recruitment, data collection, and initial organization of the study data. The faculty authors contributed to refinement of the study protocol, supervision of the research process, interpretation of findings, and data analysis. All authors contributed to the review and revision of the manuscript, approved the final version, and agreed to be accountable for the work.

Trial registration: Not applicable; this was a cross-sectional observational study.

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