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Managing Nurse Well-Being in Modern China: An Administrative Study on Factors Influencing Sleep Quality

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Abstract

This study examined sleep quality and its associated factors among clinical nurses in a Grade A tertiary hospital in Jiangsu Province, China. Specifically, it investigated the demographics, lifestyles, health-related issues, psychologies, and administrative factors associated with poor sleep quality and development of nursing-management recommendations based on the findings.

A quantitative cross-sectional survey design was used. A total of 150 registered nurses from ten clinical departments participated in the study. Data were collected through online questionnaire that included demographic information, lifestyle and health-related variables, administrative factors, the Pittsburgh Sleep Quality Index (PSQI), the Epworth Sleepiness Scale (ESS), the Insomnia Severity Index (ISI), the Perceived Stress Scale (PSS-10), and measures of perceived organizational support. Descriptive statistics, group comparisons, Spearman correlation, univariate analysis, and binary logistic regression were used.

Poor sleep quality defined as PSQI > 5 was observed among 96 respondents (64.0%). Excessive daytime sleepiness (ESS ≥ 10) was also reported by 96 respondents (64.0%). Insomnia symptoms (ISI ≥ 8) were present in 97 respondents (64.7%), while 67 respondents (44.7%) met the criterion for clinical insomnia (ISI ≥ 15). No statistically significant differences in ESS or PSQI scores were found across demographic groups. In the adjusted logistic regression model, low perceived organizational support (OR = 43.26), frequent night shifts (OR = 8.12), and high perceived workload (OR = 4.35) were significantly associated with higher odds of poor sleep quality. Regular exercise was associated with lower odds of poor sleep quality (OR = 0.33).

The findings indicate that poor sleep quality is highly prevalent among clinical nurses and is primarily associated with modifiable organizational and work-related factors. Nursing administrators should strengthen organizational support, improve shift scheduling, manage workload and staffing conditions, and promote accessible health and stress-management programs for nurses.

Keywords: *Sleep Quality, Nurses, Organizational Support, Night Shift Workload, and Nursing Management.*

INTRODUCTION

In the light of increasing demand for healthcare services in modern society nursing has become an essential part of the healthcare system. Nursing is a demanding high-risk profession that involves a range of tasks including clinical support, patient care, and health education. But sleep deprivation among nurses can lead to fatigue or burnout with its adverse effect on their performance and raise the risk of medical errors (Yang et al., 2022). The Chinese National Health Commission (2025) stated that sleep mental health and several illnesses are closely related to health. Some detrimental health can affect the result of sleep disturbances. The combined effects of sleep loss and circadian disruption experienced during shift work will lead to the development of metabolic disorders. For the nursing workforce, healthy sleep serves not only as a foundation for maintaining physical and psychological well-being but also as a critical prerequisite for accurate clinical decision-making and efficient work. Bad sleep quality was reported in many countries. Poor sleep quality was assessed to be present in 61% of nurses and the average PSQI score was more than the generally used cut-off point. Ji et al. (2023) conducted a meta-analysis of 53 studies where the findings of individual research were even more impressive, with 90.4% for nurses in South Korea (Hong & Lee, 2020) and 77.4% for hospital nurses in Iran (Khatony et al., 2020). As prior studies have shown, poor sleep quality is not limited to certain countries or medical institutions as the prevalence rates may vary. Individual study data were even

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more impressive since nurses in South Korea had a rate of 90.4% (Hong & Lee, 2020) and hospital nurses in Iran had a rate of 77.4% (Khatony et al., 2020). Poor sleep quality is not limited to a few nations or medical institutions prevalence statistics may vary across previous studies as implemented due to its readiness (Mallillin et al., 2020)

This is a common situation in China's hospitals where Dong et al. (2017) reported that nurses' poor sleep quality situation was 63.9%. The situation was pronounced in Jiangsu Province. Due to the rapid expansion of medical services and hospital capacity. Jiangsu Province accounted for 5.86% of the country's total hospital beds in 2020 which is higher than the national average (Chen, 2023). The proportion of patients admitted will gradually rise making it highly dependent on the staffing of clinical nursing staff as well as their scheduling and shift management. High patient demands, irregular shifts, and limited rest time expose nurses to greater risks. Therefore, the quality of sleep has a close relationship with the nurses' own health, work focus, clinical judgment, and ability to provide safe medical care. Some studies show that nurses' sleep quality problems may relate to personal factors. Factors such as age, gender, and marital status influence sleep patterns. Older nurses and those who are married or have family responsibilities are likely to report poor sleep quality (Chu et al., 2022). Lifestyle factors will also influence sleep quality as to drinking alcohol that can disturb the sleep structure (Lu et al., 2021). Caffeine intake can prolong or shorten sleep time (Clark & Landolt, 2017) and a lack of physical activity or exercise is related to sleep quality (Chu et al., 2022). Health problems (including chronic diseases and the use of drugs such as antidepressants, beta-blockers, etc. can aggravate the deterioration of sleep quality through physiological and pharmacological (Gonçalves et al., 2013).

The health care system in China has been gradually changing from traditional treatment of illness to health management of people's lives. The change is partly due to economic growth, increased concern about health, and greater demand for services. On the other hand, more people need nursing services as hospital grows and medical technology improves. Nurses are important part of healthcare services and their performance directly affects the quality of care and patient safety. Nationally, there are many rules and policy documents that are related to nurses' working conditions and job rights. Article 36 of the Labour Law of the People's Republic of China limits standard working hours to no more than eight hours a day and 44 hours a week on average. Article 15 of the Mental Health Law of the People's Republic of China (2018 Amendment) requires employers to provide a working environment to support employees' physical and mental health. The Law of the People's Republic of China on Basic Medical and Health Care and the Promotion of Health took effect in 2020. It strengthens occupational health protection and requires measures to improve workplace environment and condition knowledge (Mallillin et al., 2020).

Furthermore, the National Nursing Development Plan (2021-2025) calls on healthcare institutions to protect nurses' lawful rights and to provide necessary health protection and medical care measures. The laws and policies provide the basis for examining how working hours, shift arrangements, workload, and other workplace conditions relate to nurses' sleep quality. China has implemented a series of national-level legal and regulatory frameworks to protect nurses' occupational health. The International Labour Organization Convention No. 149 on Nursing Personnel (ILO, 2005) provides detailed regulation regarding nurses' working hours, rest rights, and shift systems including limiting daily working hours to 8 hours in ensuring at least 48 hours of weekly rest and guaranteeing at least 12 consecutive hours of rest between shifts. All of these worldwide standards show how important it is to manage nurses' work schedules to ensure they get enough rest and stay healthy at work. The policies are meant to protect nurses. Studies have shown that their real working condition often doesn't meet the standards. This is especially true in busy healthcare facilities. This is a higher-than-average beds in the country for 2020. The tertiary hospitals in the area are known for having a lot of patients, complicated cases, and a lot of shift work. Irregular shifts and low nurse-to-bed ratios are particularly associated with poor sleep quality such as emergency departments and intensive care units. The research is mainly based on the aspects of paying attention to nurse personal lifestyles and psychological factors. However, compared with "management-level factors" such as scheduling, workload, staffing, and organizational support, it is difficult to directly change nursing management policy as evidenced by research on individual factors among nurses. Also, many studies do not consider sleep status in a broader occupational and organizational context when assessing it (Menati, 2026). Sleep indicators alone may not explain how these management factors cause the problem. Apparently, the different geographic characteristics of each region, medical resources, medical services and workload are also different. The research results of other regions or different levels of medical institutions may not be directly applicable to this situation. More local evidence is needed to identify personal and work-related factors and develop interventions suitable for local conditions. This study discusses the relationships among demographic characteristics, lifestyle, health status, psychological factors, management factors and sleep quality situations in the nursing group of Grade A tertiary hospitals in Jiangsu Province to provide a clearer guidance as basis for clinical nursing management through a comprehensive analysis of personal factors and workplace factors (Ghobeishipour et al., 2026).

STATEMENT OF THE PROBLEM

This study aims to explore the demographic, lifestyle, health, psychological, and administrative factors associated with nurses' sleep quality in Grade A tertiary institutions in

Jiangsu Province, China. Specifically, the study is intended to answer the following questions:

1. What is the demographic profile of the respondents in terms of

1.1 gender,

1.2 age,

1.3 marital status,

1.4 educational attainment,

1.5 employment type,

1.6 living arrangement,

1.7 clinical specialization, and

1.8 years of nursing experience

2. What is the prevalence and severity of poor sleep quality among nurses as measured through

2.1 Epworth Sleepiness Scale (ESS),

2.2 Pittsburgh Sleep Quality Index (PSQI), and

2.3 Insomnia Severity Index (ISI)

3. What is the relationships between lifestyle habits, including alcohol consumption, smoking status, caffeine intake, physical exercise, and dietary regularity, and sleep-related outcomes among nurses?

4. Is there a significant difference in the prevalence of poor sleep quality as to ESS when nurses are grouped according to demographic profile?

5. Is there a significant difference in the prevalence of poor sleep quality as to PSQI when nurses are grouped according to demographic profile?

6. Among the demographic, lifestyle, health-related, psychological, and work-related variables examined in this study, what factors are significantly associated with poor sleep quality among nurses?

Hypothesis

1. There is a significant association between demographic characteristics and poor sleep quality.

2. There is a significant relationship between lifestyle behavior and poor sleep quality.

3. Significant differences in ESS scores were seen post-grouping of nurses according to demographic variables.

4. PSQI scores were significantly different after nurses were categorized by demographic variables.

5. There are factors strongly related to poor sleep quality among nurses among the variables studied in this study.

Research Design

The study utilizes the quantitative cross-sectional survey design. Data were collected by participating nurses in the same area and statistically examined (Olenchock, 2026). The approach is useful for estimating the prevalence of poor sleep quality and for studying the associations among personal, lifestyle, health-related, psychological, and work-related factors. Because data are cross-sectional, the observed associations are viewed as associations not causal links. It is an alternative research method for poor sleep in assessing the clinical performance and competency of the respondents involving the planned structure and competency for management of nurse well-being in modern China that focuses on the factors influencing the sleep quality. It views that nurses' experiences issues on sleeping quality (Khan et al., 2025).

Research Locale

This study selected a Grade A tertiary hospital in Jiangsu Province, China for sampling. This hospital provides comprehensive services through multiple clinical departments and has a large nursing workforce. The hospital provided 24-hour patient services and treated patients with various clinical complexities. Nurses in this hospital may work fixed-day or fixed-night shifts or rotating shifts and may experience irregular work schedules and a high patient care workload. The working environment of this institution is excellent for studying the association between sleep quality and personal and work-related characteristics. The hospital was selected based on convenience and the ability to collect data. Because this study was conducted at only one hospital, its findings are not generalizable to all tertiary hospitals in Jiangsu Province (Liu et al., 2026).

Population and Sampling

The study population consisted of registered nurses working in the clinical departments of this hospital. Inclusion criteria were as follows: (1) being a currently working registered nurse in the hospital, (2) holding a valid nursing license, and (3) agreeing to sign an informed consent form voluntarily. Exclusion criteria were as follows:

(1) nurses who had resigned, were on maternity leave, or sick leave for more than one month before data collection, and (2) nurses who refused to participate or withdrew from the study. Given the single-hospital setting, practical constraints on the available nursing population and the supervisor's recommendation of 15 nurses per clinical department across 10 departments. The target valid sample size was set at 150 participants. Convenience sampling was adopted. The questionnaire link was distributed through WeChat groups managed by the hospital nursing department and nurses who met the criteria were asked to join on a voluntary basis (Hu et al., 2026).

Respondents of the Study

The respondents of the study were nurses who fulfilled the inclusion criteria and answered the questionnaire. All

participants were from a selected Grade A tertiary hospital in Jiangsu Province. Before data collection informed consent was obtained and participation was entirely voluntary. It describes the sleeping quality of nurses' competency for work related factors and confidence in the workplace particularly in Jiangsu province hospital (Mägi et al., 2026).

Data Gathering Procedure

All data were collected online by WeChat Questionnaire Star, on the questionnaire webpage, the aim of the study, the use of information, confidentiality, voluntary participation, and the ability to withdraw at any time without condition were presented. The coordination of the nursing department and the questionnaire link were pushed through the WeChat group. The data collection period lasted for 2 weeks. Among the 10 participating departments approximately 15 valid questionnaires were received per department. All returned questionnaires underwent completeness checks. A total of 150 fully completed questionnaires were retained for analysis with no missing values for the primary study variables. Data analysis was subsequently conducted using SPSS version 26.0 (Shaheen et al., 2026).

RESULTS AND DISCUSSION

On the Profiles of the Respondents

Table 1. Profiles of the Respondents

Variable	Category	n%
Gender	Male Female	7 (4.7) 143 (95.3)
Age	25 years and below 26-30 years 31-35 years 36-40 years 41-45 years 46 year and above	29 (19.3) 56 (37.3) 34 (22.7) 19 (12.7) 9 (6.0) 3 (2.0)
Marital Status	Unmarried Married Divorced Widowed	51 (34.0) 84 (56.0) 11 (7.3) 4 (2.7)
Education	Junior College or lower Bachelors' Degree Masters' Degree or above	25 (16.7) 121 (80.7) 4 (2.7)
Employment Type	Permanent position Contract position Labor dispatch	36 (24.0) 99 (66.0) 15 (10.0)
Residence	Living alone With spouse/partner With family Hospital dormitory	31 (20.7) 45 (30.0) 57 (38.0) 17 (11.3)
Clinic Specialization	Internal Medicine Surgery Emergency ICU Obstetrics and Gynecology Pediatrics Oncology Orthopedics Neurology Other Clinical Department	15 (10.0) 15 (10.0) 15 (10.0) 15 (10.0) 15 (10.0) 15 (10.0) 15 (10.0) 15 (10.0) 15 (10.0) 15 (10.0)
Work years	Less than 1 year 1-3 years 4-6 years 7-10 years More than 10 years	24 (16.0) 44. (29.3) 45 (30.0) 20 (13.3) 17 (11.3)

Table 1 presents the profile of the 150 respondents. Most were women (95.3%, n = 143). The largest age category was 26–30 years (37.3%, n = 56), followed by 31–35 years (22.7%, n = 34) and 20–25 years (19.3%, n = 29). Thus, most respondents were in early or middle adulthood. Eighty- four nurses were married (56.0%), while 51 were single (34.0%).

In terms of education level, most had a bachelor's degree. (80.7%, n = 121), 16.7% (n = 25) had an associate degree or lower, and only 2.7% (n = 4) held a masters' degree or higher. Regarding employment type, contract workers accounted for the largest proportion (66.0%, n = 99), followed by permanent employees (24.0%, n = 36) and dispatched workers (10.0%, n = 15). Housing arrangements varied: 38.0% (n = 57) lived with family members, 30.0% (n = 45) lived with their spouse or partner, 20.7% (n = 31) lived alone, and 11.3% (n = 17) lived in hospital dormitories.

In terms of clinical specialties, the sample was evenly distributed across ten participating departments, with 15 nurses (10.0%) in each department. Internal Medicine, Surgery, Emergency Department, Intensive Care Unit, Obstetrics and Gynecology, Pediatrics, Oncology, Orthopedics, Neurology, and other clinical departments. 29.3% (n=44) of the nurses have 1-3 years of work experience, and 30.0% (n=45) have 4-6 years of work experience, with the majority of experience concentrated in the 1–6-year range. Only 11.3% (n=17) of the nurses have more than ten years of work experience.

Findings of the study show that the profiles of the respondents on management of nurses in the quality of sleep vis a vis on their work performance explores specific relationships on the demographics as to characteristics and work experiences for their physical activity levels in terms of sleep quality that can affect work performance inside the hospital duty. It is critical for the night shift nurses in developing scheduling evidence for sleep quality and initiatives as to physical work activity programs to mitigate the night work and negative impacts. This can promote ultimate work sustainability for the outcome and safety of patients (Zydziunaite, 2026).

On the Prevalence and Severity of Poor Sleep Quality among Nurses' Respondents

Table 2. Prevalence of Sleep-Related Conditions of the Respondents

Condition	No, n (%)	Yes, n (%)
• Poor Sleep Quality (PSQI>5)	54 (36.0)	96 (64.0)
• Excessive daytime sleepiness (ESS>=10)	54 (36.0)	96 (64.0)
• Insomnia symptoms (ISI>=8)	53 (35.3)	97 (64.7)
• Clinical Insomnia (ISI>=15)	83 (55.3)	67 (44.7)

Table 2 presents the prevalence of sleep-related conditions using a PSQI score 5, 96 of the 150 nurses (64.0%) were classified as having poor sleep quality. The same number had ESS scores of at least 10, indicating excessive daytime sleepiness. ISI scores showed insomnia symptoms in 97 respondents (64.7%) and clinical insomnia in 67 (44.7%). The three measures therefore pointed to a substantial sleep burden in this sample.

Findings of the study show that prevalence and severity of poor sleep quality among nurses in Jiangsu Province Hospital jeopardized patient safety and well-being due to sleeping disturbance which is very critical on the health issues or health care providers. It modifies and identifies prevalence which is significant on the development intervention of effective management of nurses for the benefits of the patients, nurses, and the owner of the hospital as well. Sleeping quality must be considered by the hospitals and this must be incorporated in the scheduling process of shift work and health behavior, optimize shift schedules, mitigate risk, and enhances support among nurses because they are the lifeblood of the hospital operation. Allocate resources and healthy lifestyle to improve health care system and sleep quality (Bin et a., 2025)

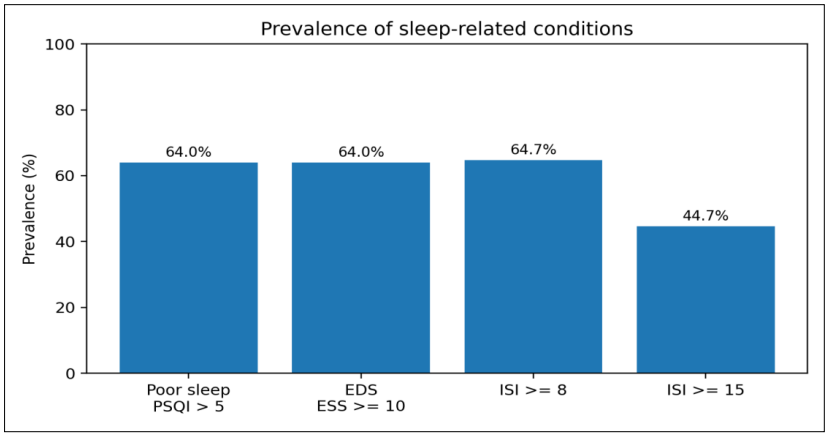

Figure 1. Prevalence of poor sleep quality, excessive daytime sleepiness, and insomnia-related conditions

Table 3. Descriptive Statistics of Main Scale Scores of the Respondents

Variable	Possible Range	Minimum	Maximum	Mean ± SD
• PSQI total	0–21	1.00	16.00	9.06 ± 5.15
• ESS total	0–24	1.00	20.00	11.12 ± 5.40
• ISI total	0–28	0.00	21.00	11.26 ± 5.87
• Sleep latency min	-	8.00	90.00	51.72 ± 29.37
• Actual duration sleep	-	4.20	8.00	6.22 ± 0.95

Table 3 presents the descriptive statistics of main scale scores of the sample's overall tendency toward poor sleep quality was indicated by the mean PSQI total score of 9.06 ± 5.15 (Table 3). The average total score of ISI was 11.26 ± 5.87, and the average total score of ESS was 11.12 ± 5.40, both of which were higher than the threshold for daytime sleepiness (≥ 10). On a 5-point scale, perceived organizational support had a modest mean score of 3.21 ± 0.70, whereas reported stress averaged 23.56 ± 7.12 out of 40. The average sleep length was 6.22 ± 0.95 hours each night, while the average sleep latency was 51.72 ± 29.37 minutes.

Findings show that poor sleep quality can affect the performance of nurses in their work area. It can jeopardize the safety of the patients under treatment. Sleeping disturbance has a risk in all aspects especially that nurses are health care providers to their patients. It also reveals the sleep latency and sleep duration influencing severity of work output that can be addressed by the administration in managing the work schedule to prevent any chaos performed by the nurses. This benefits the hospital, nurses, and the patients (Wang et al., 2026).

Table 4. PSQI Component Scores of the Respondents

PSQI Component	Mean	SD
• Subjective sleep quality	1.37	0.95
• Sleep latency	1.45	0.96
• Sleep duration	1.31	0.89
• Habitual sleep efficiency	1.35	0.97
• Sleep disturbances	1.61	1.07
• Uses of sleep medication	0.57	0.63
• Daytime dysfunction	1.39	1.00

Table 4 presents the PSQI component scores. It shows in the table that sleep disruptions had the highest mean score (1.61 ± 1.07) among the seven PSQI components. Followed by sleep latency (1.45 ± 0.96), daytime dysfunction (1.39 ± 1.00), and subjective sleep quality (1.37 ± 0.95). The lowest component score (0.57 ± 0.63) was associated with the use of sleep medication, suggesting that although sleep quality was significantly compromised, medication-seeking behavior remained relatively rare.

Findings of the study suggest that delayed sleep onset, disturbed sleep architecture, and poor daytime functioning were the main indicators of poor sleep quality in this cohort. It enhances the correlation, profiles, and subjective predictors of sleep quality to obtain patient satisfaction and work performance. Respondents with poor sleep quality affects work output and performance. It highlights the significance of sleep quality for proper management in the hospital that measures poor sleep quality of individual nurses in a systematic duration of socioeconomic factors and demographic profiles. It addresses the importance of sleep misconception in addressing clinical evaluation for emphasizing napping estimation. Sleep duration is a component and fundamental quality for critical evaluation of nurses' workers and determination to their overall health welfare while working in the hospital. It is a challenge for both nurse workers and the administration of the hospital (Paudel et al., 2026).

Table 5. ESS and ISI Item-Level Scores of the Respondents

Scale Item	Content	Mean	SD
ESS 1	Sitting and Reading	1.32	0.92
ESS 2	Watching TV	1.34	0.90

ESS 3	Sitting inactive in a public place	1.46	0.84
ESS 4	Passenger in a car for one hour	1.39	0.84
ESS 5	Lying down to the rest on the afternoon	1.45	0.90
ESS 6	Sitting and talking to someone	1.39	0.91
ESS 7	Sitting quietly after lunch	1.38	0.80
ESS 8	Stop in a traffic while driving	1.39	0.91
ISS 1	Difficulty falling asleep	1.62	1.04
ISS 2	Difficulty staying asleep	1.64	1.03
ISS 3	Early morning awakening	1.53	0.86
ISS 4	Satisfaction with sleep pattern	1.55	1.08
ISS 5	Sleep problems noticeable to others	1.61	1.00
ISS 6	Worry or distress about sleep	1.68	1.03
ISS 7	Interference with daily functions	1.62	1.01

Table 5 presents the ESS and ISI item-level scores. It shows that ESS scores were relatively consistent across the eight situational questions at the item level. Sitting and reading having the lowest mean (1.32 ± 0.92) and sitting inactive in a public location having the highest mean (1.46 ± 0.84). The ISI showed a pattern of the psychological and functional effects of insomnia, with worry or distress about sleep having the highest mean item score (1.68 ± 1.03), followed by trouble staying asleep (1.64 ± 1.03) and interference with everyday functioning (1.62 ± 1.01).

Findings of the study show that ESS and ISI item-level scores of nurses' management on sleeping quality among the respondents suggest that shift work evidence for on-call-rotation have a negative effect on nurse workers and health providers. It is an optimal duration and frequency benefit for shifts specially on nurse trainees, safety of patients, and any health care providers are inclusive. It provides knowledge for both administrators and nurse workers the knowledge on the impact of sleep quality to maintain work output. The results of the study evaluate the sleep quality and knowledge of nurse respondents in the hospital management for Jiangsu Province Hospital. It establishes the limitation measure and hour regulation of nurses in their working condition. It demonstrates a health performance and positive effect for nurse health care providers (Zhang et al., 2026).

On the Relationships between Lifestyle Habits, Including Alcohol Consumption, Smoking Status, Caffeine Intake, Physical Exercise, and Dietary Regularity, and Sleep-Related Outcomes among Nurses

Table 6. Lifestyle and Occupational Characteristics of the Respondents

Variable	Category	n%
• Alcohol frequency	Never Rarely, less than once per month Occasional, 1-3 times per month Often, 1-3 times per week Almost everyday	111 (74.0) 19 (12.7) 14 (9.3) 4 (2.7) 2 (1.3)
• Smoking status	Never smoking Former smoking Occasional smoking Daily smoking	138 (92.0) 5 (3.3) 4 (2.7) 3 (2.0)
• Caffeine frequency	Never Rarely, less than once per week Occasionally, 1-3 times per week Often, 4-6 times per week Daily	19 (12.7) 31 (20.7) 54 (36.0) 34 (22.7) 12 (8.0)
• Caffeine intake time	Not applicable Morning only Afternoon Evening Night	19 (12.7) 69 (46.0) 40 (26.7) 18 (12.0) 4 (2.7)

• Exercise frequency	Never Once per week 2-3 times per week 4-5 times per week 6-7 times per week	62 (41.3) 19 (12.7) 40 (26.7) 15 (10.0) 14 (9.3)
• Diet Regularly	Very regular Basic regular Irregular Very irregular	22 (14.7) 61 (40.7) 45 (30.0) 22 (14.7)

Table 6 displays the respondents' occupational and lifestyle characteristics. Most nurses reported never smoking (92.0%, n = 138) and not consuming alcohol (74.0%, n = 111). With 36.0% (n = 54) consuming caffeinated beverages 1-3 times per week and 22.7% (n = 34) consuming them 4-6 times per week, caffeine consumption was widespread. Of those who drank coffee, 46.0% (n = 69) only did so in the morning. Only 26.7% (n = 40) reported exercising two to three times a week, and 41.3% (n = 62) claimed never exercising. With 30.0% (n = 45) reporting irregular and 14.7% (n = 22) reporting extremely irregular meal patterns, diet irregularity was widespread.

Findings of the study show the relationships between lifestyle habits, including alcohol consumption, smoking status, caffeine intake, physical exercise, dietary regularity, and sleep-related outcomes among nurses. It provides pivotal compassionate care for the patients. It promotes health behaviors that are linked to a healthy lifestyle. It provides challenges of nurse sleeping quality on their well-being and health witnessing the prevalence of burnout, lifestyle, and illness that could affect due to lack of sleep quality (Khan & Rasheed, 2026).

Table 7. Spearman Correlations Between Lifestyles and Sleep-Related Outcomes

Lifestyle Variable	PSQI r	ESS r	ISI r
Caffeine frequency	0.026 (0.750)	0.019 (0.813)	0.125 (0.126)
Caffeine afternoon	0.046 (0.576)	0.096 (0.245)	0.160 (0.051)
Exercise frequency	-0.108 (0.190)	-0.090 (0.275)	-0.064 (0.436)
Regular exercise	-0.155 (0.059)	-0.144 (0.078)	-0.116 (0.157)
Diet irregularity	0.117 (0.153)	0.031 (0.710)	0.057 (0.492)
Alcohol frequency	0.070 (0.396)	0.053 (0.519)	0.085 (0.302)
Smoking status	-0.112 (0.173)	-0.104 (0.203)	-0.125 (0.126)

Table 7 presents the spearman's correlation that was used to examine lifestyle variables in relation to PSQI, ESS, and ISI totals. It shows that the correlation coefficients were generally small and none reached the 0.05 significance level. Afternoon caffeine intake showed a weak positive correlation with ISI (r = .160, p = .051).

Findings of the study show that the result was close to the specified significance level, it was still not statistically significant. Alcohol use, smoking, overall caffeine frequency, and irregular eating were also not significant. In this sample, lifestyle measures alone accounted for little of the variation in sleep scores. Their effects may depend on work schedules, stress, or other factors not captured by a simple bivariate correlation (Earle-Thompson, 2027).

On the Prevalence of Poor Sleep Quality between the ESS and PSQI when Nurses are Grouped According to Demographic Profile

Table 8. ESS and PSQI Mean by Age, Marital Status, and Clinical Specialization

Grouping Variable	Category	n	ESS Mean ± SD	PSQI Mean ± SD
• Age	20-25 years 26-30 years 31-35 years 36-40 years 41-45 years 46 years above	29 56 34 19 9 3	10.66 ± 5.26 10.48 ± 5.71 12.97 ± 4.87 11.21 ± 5.30 9.67 ± 5.41 10.33 ± 6.66	8.34 ± 4.76 8.70 ± 5.47 10.59 ± 4.50 9.05 ± 4.94 7.44 ± 6.23 10.33 ± 8.08
• Marital status	Unmarried Married Divorced Widowed	51 84 11 4	11.02 ± 5.25 11.25 ± 5.51 10.00 ± 5.64 12.75 ± 5.97	9.10 ± 5.30 9.12 ± 4.92 8.37 ± 6.51 9.50 ± 6.03

• Clinical Specialization	Internal Medicine	15	11.00 ± 3.87	8.93 ± 5.51
	Surgery	15	9.07 ± 5.62	7.13 ± 5.51
	Emergency	15	14.07 ± 3.28	12.40 ± 3.09
	ICU	15	13.00 ± 6.04	10.27 ± 4.65
	OBGyne	15	12.20 ± 5.17	9.80 ± 5.16
	Pediatrics	15	9.07 ± 6.09	7.00 ± 5.18
	Oncology	15	10.67 ± 5.26	9.00 ± 4.72
	Orthopedics	15	8.53 ± 5.72	6.87 ± 5.45
	Neurology	15	11.67 ± 5.41	9.67 ± 5.61
	Others:	15	11.93 ± 5.60	9.53 ± 5.41

Table 8 shows the comparisons of ESS and PSQI scores among demographic categories. Both parametric and nonparametric tests revealed no statistically significant differences in ESS or PSQI scores across demographic groups, like gender, age group, marital status, or clinical specialization. Gender-wise, male nurses (n = 7) had numerically higher mean ESS (13.57 ± 3.64) and PSQI (11.71 ± 4.19) scores than female nurses (ESS: 11.00 ± 5.45; PSQI: 8.93 ± 5.17); however, these differences were not statistically significant (t = 1.772, p =.117 for ESS; t = 1.695, p =.134 for PSQI). For age, no significant differences in ESS (F = 1.147, p = .338; Kruskal-Wallis H = 3.895, p = .565) or PSQI (F = 0.978, p = .433; H = 4.378, p = .496) scores were found across the six age groups. Although these differences were not statistically significant, the 31–35 age group had the highest mean PSQI score (10.59 ± 4.50) and ESS score (12.97 ± 4.87). Similarly, neither PSQI (F = 0.098, p =.961) nor ESS (F = 0.297, p =.828) showed any significant differences by marital status. Regarding clinical specialization, Emergency and ICU nurses showed numerically higher mean ESS and PSQI scores (Emergency: ESS 14.07 ± 3.28, PSQI 12.40 ± 3.09; ICU: ESS 13.00 ± 6.04, PSQI 10.27 ± 4.65) compared to lower-intensity departments such as Orthopedics (ESS 8.53 ± 5.72, PSQI 6.87 ± 5.45) and Pediatrics (ESS 9.07 ± 6.09, PSQI 7.00 ± 5.18). However, the ANOVA and Kruskal-Wallis tests did not yield statistically significant results for ESS (F = 1.776, p = .078; H = 15.126, p = .088) or PSQI (F = 1.739, p = .086; H = 13.775, p = .131). Given the modest subgroup sizes of 15 nurses per department, the p-values may indicate insufficient statistical power as they approached but did not exceed the traditional significance threshold of 0.05.

Findings of the study show that the prevalence of poor sleep quality between the ESS and PSQI when nurses are grouped according to demographic profile. It also reveals that sleep quality of nurses is significant and necessary for a stressful environment as to the work of nurses in an emergency department. It predicts the sleep quality of the demographic profiles and variables as to work experiences, marital status, gender, and age which resulted in job satisfaction for the patients in the hospital (Fouladi & Davoudi, 2026).

On the Significant Difference in the Prevalence of Poor Sleep Quality between the ESS and PSQI when Nurses are Grouped According to Demographic Profile

Table 9. Statistical Test for Group Differences in ESS and PSQI Scores

Outcome	Grouping Variable	Group Means/Note	Test Statistics	P/Nonparametric
ESS	Gender	M=13.57 ± 3.64 F=11.00 ± 5.45	t=1.772	0.117
PSQI	Gender	M=11.71± 4.19 F=8.93 ± 5.17	t=1.695	0.134
ESS	Age	Group means are shown in Table 8	f=1.147 h=3.895	0.338/0.565
PSQI	Age	Group means are shown in Table 8	f=0.978 h=4.378	0.433/0.496
ESS	Marital Status	Group means are shown in Table 8	f=0.297 h=0.868	0.828/0833
PSQI	Marital Status	Group means are shown in Table 8	f=0.098 h=0.216	0.962/0.975
ESS	Clinical Specialization	Group means are shown in Table 8	f=1.776 h=15.126	0.078/0.088
PSQI	Clinical Specialization	Group means are shown in Table 8	f=1.739 h=13.775	0.088/0.131

Table 9 presents the statistical tests for group differences in ESS and PSQI scores. All reported parametric and nonparametric p-values were greater than .05. Therefore, no statistically significant differences in ESS or PSQI scores were observed across gender, age, marital status, or clinical specialization.

Findings of the study show that the significant difference in the prevalence of poor sleep quality between the ESS and PSQI when nurses are grouped according to demographic profile reveals that poor sleep quality must be prevented because it affects the performance of the nurses on duty in the hospital that needs to be addressed where programs and policies must be given emphasis. This is being influenced by the environmental factors in the working area and lifestyle. Lifestyles are factors for irregular sleep of nurses working in the hospital (Mithurja et al., 2026).

On among the Demographic, Lifestyle, Health-Related, Psychological, and Work-Related Variables Examined in this Study and what Factors are Significantly Associated with Poor Sleep Quality among Nurses

Table 10. Complete Univariate Categorical Analysis of Poor Sleep Quality

Variable	Category	n	Poor Sleep, n (%)	Test	P
Gender	Male	7	6 (85.7)	Fisher exact	0.422
	Female	143	90 (62.9)		
Age	20-25 years	29	17 (58.6)	X^2=6.159	0.291
	26-30 years	56	33 (58.9)		
	31-35 years	34	27 (79.4)		
	36-40 years	19	13 (68.4)		
	41-45 years	9	4 (44.4)		
	46 years above	3	2 (66.7)		
Marital Status	Unmarried	51	32 (62.7)	X^2=0.751	0.861
	Married	84	55 (65.5)		
	Divorced	11	6 (54.5)		
	Widowed	4	3 (75.0)		
Education	Junior College or lower	25	19 (76.00)	X^2=2.197	0.333
	Bachelors' Degree	121	74 (61.2)		
	Masters' Degree or above	4	3 (75.0)		
Employment Type	Permanent position	36	26 (72.2)	X^2=1.598	0.450
	Contract position	99	60 (60.0)		
	Labor dispatch	15	10 (66.7)		
Residence	Living alone	31	14 (45.2)	X^2=7.748	0.052
	With spouse/partner	45	29 (64.4)		
	With family	57	39 (68.4)		
	Hospital dormitory	17	14 (82.4)		
Clinical Specialization	Internal Medicine	15	10 (66.7)	X^2=14.583	0.103
	Surgery	15	7 (46.7)		
	Emergency	15	14 (93.3)		
	ICU	15	11 (73.3)		
	Obstetrics and Gynecology	15	11 (73.3)		
	Pediatrics	15	7 (46.7)		
	Oncology	15	10 (66.7)		
	Orthopedics	15	6 (40.0)		
	Neurology	15	10 (66.7)		
	Other Clinical Department	15	10 (66.7)		
Work Years	Less than 1 year	24	11 (45.8)	X^2=6.452	
	1-3 years	44	29 (65.9)		
	4-6 years	45	34 (75.6)		
	7-10 years	20	12 (60.0)		
	More than 10 years	17	10 (58.8)		

Alcohol frequency	Never Rarely, less than once per month Occasional, 1-3 times per month Often, 1-3 times per week Almost everyday	111 19 14 4 2	70 (63.1) 10 (52.6) 12 (85.7) 3 (75.0) 1 (50.00)	X^2=4.353	0.360
Alcohol Amount	Not applicable 1 unit or less 2-3 units 4 units or above	111 23 11 5	70 (63.1) 14 (60.9) 9 (81.8) 3 (60.0)	X^2=1.691	0.639
Smoking Status	Never smoking Former smoking Occasional smoking Daily smoking	138 5 4 3	91 (65.9) 3 (60.0) 1 (25.0) 1 (33.3)	X^2=4.126	0.248
Caffeine Frequency	Never Rarely, less than once per week Occasionally, 1-3 times per week Often, 4-6 times per week Daily	19 31 54 34 12	14 (73.7) 20 (64.5) 32 (59.3) 20 (58.8) 10 (83.3)	X^2=3.646	0.456
Caffeine intake time	Not applicable Morning only Afternoon Evening Night	19 69 40 18 4	14 (73.7) 39 (56.5) 26 (65.0) 13 (72.2) 4 (100.0)	X^2=5.244	0.263
Exercise frequency	Never Once per week 2-3 times per week 4-5 times per week 6-7 times per week	62 19 40 15 14	45 (72.6) 13 (68.4) 19 (47.5) 9 (60.0) 10 (71.4)	X^2=7.309	0.120
Diet Regularly	Very regular Basic regular Irregular Very irregular	22 61 45 22	15 (68.2) 35 (57.4) 31 (68.2) 15 (68.2)	X^2=1.962	0.580
Any chronic diseases	Yes No	82 68	51 (62.2) 45 (66.2)	X^2=0.256	0.613
Medication that may affect sleep	No Yes	127 23	86 (67.7) 10 (43.5)	X^2=4.965	0.026
Shift Type	Fixed day shift Fixed night shift Rotating shift	44 9 97	18 (40.9) 9 (100.0) 69 (71.1)	X^2=17.388	<0.001
Monthly night-shift frequency	No night shift 1-2 times 3-4 times 5-6 times 7 times or more	44 12 36 32 26	18 (40.9) 7 (58.3) 21 (58.3) 29 (90.6) 21 (80.8)	X^2=23.870	<0.001
Weekly work hours	40 hours or below 41-48 hours 49-56 hours 57-64 hours	24 55 47 24	10 (41.7) 34 (61.8) 33 (70.2) 19 (79.2)	X^2=8.493	0.037
Patient ratio	1:1-3 1:4-6 1:7-9 1:10 or above	32 64 35 19	20 (62.5) 41 (64.1) 23 (65.7) 12 (63.2)	X^2=0.082	0.994

Rest Interval	Less than 8 hours 8-11 hours 12-15 hours 16 hours or above	33 41 40 36	27 (81.8) 29 (70.7) 25 (62.5) 15 (41.7)	X^2=13.186	0.004
Perceived workload	Very light Tolerable Slightly heavy Heavy Very heavy	5 20 43 30 52	1 (20.0) 8 (40.0) 21 (48.8) 23 (76.7) 43 (82.7)	X^2=23.467	<0.001
Low organizational support	No Yes	94 56	44 (46.8) 52 (92.9)	X^2=32.298	<0.001
High perceived stress	No Yes	72 78	24 (33.3) 72 (92.3)	X^2=56.517	<0.001

Table 10 Complete univariate categorical analysis of poor sleep quality. It reveals that gender, age, marital status, education level, employment type, domicile, clinical specialization, and work years were among the demographic characteristics for which no significant correlations were discovered. The only lifestyle factor that significantly correlated with poor sleep quality was regular exercise: nurses who regularly exercised had a lower prevalence of poor sleep quality than those who did not (55.1% vs. 71.6%, χ^2 test, p =.036). Alcohol consumption, smoking status, caffeine intake frequency, caffeine timing, and dietary irregularity did not reach statistical significance.

Among health-related variables, nurses currently using medications known to affect sleep had a significantly lower prevalence of poor sleep quality than those not using such medications (43.5% vs. 67.7%, p = .026). The presence of chronic disease was not significantly associated with poor sleep quality (p = .613).

Among administrative variables, several factors were strongly associated with poor sleep quality. Shift type showed a highly significant association (χ^2 = 17.388, p < .001): all nurses on fixed night shifts reported poor sleep quality (100%), compared to 71.1% of rotating-shift nurses and 40.9% of fixed day-shift nurses. Monthly night-shift frequency was also highly significant (χ^2 = 23.870, p < .001), with the highest prevalence among nurses working 5–6-night shifts per month (90.6%) and 7 or more-night shifts per month (80.8%), compared to 40.9% among those with no night shifts. Weekly working hours showed a significant positive trend (p = .037), with the prevalence of poor sleep quality rising from 41.7% at 40 hours or below to 79.2% at 57-64 hours. Rest interval between adjacent shifts was significantly associated with poor sleep quality (p = .004), with prevalence declining progressively from 81.8% among nurses with less than 8 hours of rest to 41.7% among those with 16 or more hours of rest. Perceived workload showed the strongest categorical association (χ^2 = 23.467, p < .001), with 82.7% of nurses reporting very heavy or difficult-to-cope workloads experiencing poor sleep quality, compared to 20.0% among those with tolerable workloads. Low organizational support (χ^2 = 32.298, p < .001) and high perceived stress (χ^2 = 56.517, p < .001) were also strongly associated with poor sleep quality, with prevalence rates of 92.9% and 92.3%, respectively, in the exposed groups.

Findings of the study show that the demographic, lifestyle, health-related, psychological, and work-related variables examined in this study and what factors are significantly associated with poor sleep quality among nurses evaluate the psychological distress, sleep quality, and shift work among health care providers. The findings suggest that poor sleep quality may represent psychological distress on shift work that affects work output of the respondents. Poor quality sleep may affect the nurse worker and well- being (Bakırhan & Küçükkelepçe, 2026).

Table 11. Continuous Variable Comparison by Sleep Quality Status

Variable	Non-Poor Sleep Mean ± SD	Poor Sleep Mean ± SD	t statistics	t-test p	Mann-Whitney p
BMI	22.01±2.13	21.79±2.02	t=0.619	0.537	0.427
Sleep latency, min	23.65±16.76	67.51±22.29	t=13.627	<0.001	<0.001
Actual sleep duration, h	7.18±0.58	5.68±0.65	t=14.499	<0.001	<0.001
ESS total	4.46±1.53	14.86±2.26	t=33.551	<0.001	<0.001
ISI total	3.91±1.73	15.40±2.09	t=36.168	<0.001	<0.001
PSS total	17.28±5.01	27.09±5.51	t=11.109	<0.001	<0.001
POS mean	3.70±0.57	2.93±0.61	t=7.615	<0.001	<0.001

Table 11 presents the continuous variable comparison by sleep quality status to examine which factors remained associated with poor sleep quality after the selected predictors were considered together. The overall model was significant according to the omnibus likelihood-ratio test ($p < .001$). Cox-Snell R2 was .433 and Nagelkerke R2 was 0.594, indicating that the included predictors accounted for a substantial part of the observed variation, although these values are not interpreted in exactly the same way as R2 in linear regression. The model correctly classified 84.0% of respondents.

In this study, four variables were found to be statistically significant. The adjusted association between a low perceived level of organizational support and poor sleep quality was the strongest (adjusted OR = 43.26, 95% CI: 10.88–172.05, $p < .001$). The wide confidence interval indicates that the estimated value should be interpreted with caution. Nurses with at least five-night duties per month also had higher odds of poor sleep (adjusted OR = 8.12, 95% CI: 2.39-27.57, $p < .001$). High perceived workload was independently associated with the outcome (adjusted OR = 4.35, 95% CI: 1.39-13.55, p = .011). Regular exercise showed the opposite pattern. Nurses who exercised at least two or three times per week had lower odds of poor sleep quality (adjusted OR = 0.33, 95% CI: 0.12-0.89, p = .029). Irregular diet had a positive but nonsignificant estimate (adjusted OR = 2.60, 95% CI: 0.92- 7.31, p = .070). Long working hours (p = .779) and caffeine use after noon (p =.451) were also nonsignificant after adjustment.

Findings of the study show that continuous variable comparison by sleep quality status describe associations within the sample and should not be interpreted as proof of causation. Quality of work output is based on the physical capacity of individual nurse worker where sleep quality is necessary in providing energy while the health care providers are on duty (Alharbi et al. 2026).

CONCLUSIONS

1. The majority of the respondents were females, early in their careers, and from all 10 departments in the survey. Demographic data provided context to the findings but were not statistically significant in determining the outcomes of factors affecting sleep.
2. This sample had a significant prevalence of sleep-related issues. Nearly half of the nurses met the criteria for clinical insomnia and around two-thirds had poor sleep quality, excessive daytime drowsiness, or symptoms of insomnia. In this hospital setting, sleep health is therefore a significant occupational health risk.
3. There were few direct correlations between the observed sleep results and individual lifestyle choices. However, following adjustment, frequent exercise was linked to lower odds of poor sleep quality, suggesting that possibilities for health promotion can supplement organizational interventions rather than take their place.
4. There were no appreciable differences in ESS scores between the demographic categories that were looked at. As a result, excessive daytime sleepiness shouldn't be seen as an issue unique to this sample's demographic subgroup.
5. There was no discernible difference in PSQI ratings between the demographic groups that were studied. The current cross-sectional data do not demonstrate statistically significant departmental differences, despite the fact that emergency and intensive care unit nurses had higher descriptive scores.
6. Poor sleep quality was most strongly connected with perceived effort, frequency of night shifts, and organizational support. These associations support the notion that nurses' sleep health is influenced by individual characteristics and modifiable work conditions. This study was cross-sectional, and the findings reflect associations and not proof of causality.
7. The results support the establishment of a comprehensive nurses' sleep health management program that targets workload, shift scheduling, organizational support, and individual requirements. The program should be a continuous quality improvement process, with regular evaluation of its implementation and outcomes, not a one-time activity.

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