

Original Article

Assessment of Sleep Quality & Chronotype of Nursing Students at New Advance College of Nursing, Lahore

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Received: 02 February 2026

Revised: 10 February 2026

Accepted: 09 March 2026

Published: 15 March 2026

HOW TO CITE

Ramish Mushtaq et al. 2026. Assessment of Sleep Quality & Chronotype of Nursing Students at New Advance College of Nursing, Lahore. *Journal of Health, Wellness and Community Research*. 4, 5 (Mar. 2026), 1–9. DOI:<https://doi.org/10.61919/hr630d52>

ARTICLE INFORMATION

Author Contributions	Concept: RM, SS; Design: RM, SS; Data Collection: TI, IG; Analysis: RM, TI; Drafting: RM, TI, IG; Critical Review and Final Approval: SS, RM, TI, IG.
Ethical Approval	The study was approved by research ethical board of New Advance College of Nursing, Lahore, Punjab, Pakistan
Informed Consent	Written informed consent was obtained from all participants
Conflict of Interest	The authors declare no conflict of interest.
Funding	No external funding.
Data Availability	Available from the corresponding author on reasonable request.
AI Declaration	No generative AI was used for conceptualization, analysis, or content generation. AI use was limited to language refinement, and the authors remain fully responsible for the accuracy, originality, validity, and integrity of the manuscript's content.

ABSTRACT

Background: Sleep disturbance and variation in circadian preference are relevant concerns among nursing students because academic, clinical, and work schedules may interfere with normal sleep patterns. **Objective:** To assess sleep quality and chronotype-related characteristics among Post-RN nursing students at New Advance College of Nursing, Lahore. **Methods:** A quantitative descriptive cross-sectional study included 50 students aged 20–34 years selected from a population of 57 through non-probability convenience sampling. Data were collected using demographic questions, the Morningness–Eveningness Questionnaire, and the Pittsburgh Sleep Quality Index. Descriptive statistics were reported as frequencies and percentages. **Results:** Short and delayed sleep patterns were common. Thirty-two participants (64.0%) reported <5 hours of sleep per night, 36 (72.0%) required >30 minutes to fall asleep, and 30 (60.0%) usually went to bed after 12:45 AM. Overall, 46 participants (92.0%) rated their sleep as fairly bad or very bad. Twenty-eight (56.0%) identified their preferred peak functioning time after 5:00 PM, and 35 (70.0%) described themselves as more evening-oriented or definitely evening type. **Conclusion:** The sampled nursing students demonstrated substantial sleep-related difficulties together with a tendency toward later preferred sleep and activity timing. These findings describe the study population but do not establish a causal or statistical relationship between chronotype and sleep quality. **Keywords:** Chronotype; Circadian Rhythm; Nursing Students; Sleep Quality; Morningness–Eveningness Questionnaire; Pittsburgh Sleep Quality Index.

INTRODUCTION

Sleep is an essential physiological process that supports physical restoration, cognitive functioning, emotional regulation, and overall health. Sleep quality is a multidimensional concept encompassing sleep duration, sleep latency, nocturnal awakenings, ability to resume sleep, and an individual's overall satisfaction with the sleep experience (1). Sleep–wake behavior is regulated by the interaction between homeostatic sleep pressure and the circadian timing system, and disruption of these processes may contribute to inadequate or irregular sleep patterns (2). University students are particularly vulnerable to sleep disturbances because academic demands, irregular schedules, social activities, and lifestyle-related factors may interfere with normal sleep routines. Nursing students

may face additional challenges because their education combines academic coursework with clinical responsibilities, which can increase stress and interfere with adequate rest (3,4).

An important biological factor related to sleep behavior is chronotype, which reflects an individual's preferred timing of sleep, wakefulness, and daily activity. Chronotype generally ranges from morning preference to evening preference, with many individuals demonstrating an intermediate pattern. Morning-type individuals tend to wake and function optimally earlier in the day, whereas evening-type individuals generally prefer later sleep and activity schedules. Chronotype is influenced by biological and environmental factors and varies with age and lifestyle characteristics (5). Differences in chronotype may have implications for daily functioning because individual circadian preference may not always correspond with externally imposed academic or occupational schedules. Such circadian misalignment may be particularly relevant for nursing students who must accommodate early academic activities, clinical placements, and, in some cases, employment-related shifts.

Previous research has demonstrated that chronotype is associated with sleep-related and health-related characteristics in university populations. Among Chinese college students, chronotype has been examined in relation to sleep patterns and depressive symptoms, with later chronotypes showing less favorable sleep-related characteristics (6). Similarly, evening preference has been associated with poorer sleep quality among college students, with sleep quality also playing a role in psychological well-being (7). These findings suggest that chronotype is not merely a preference for sleeping and waking at particular times but may be relevant to broader patterns of sleep health and daytime functioning.

Evidence specifically involving nursing students also indicates that sleep quality and chronotype are important concerns. Ota et al. investigated chronotype, sleep characteristics, and health-related quality of life among nursing students and reported that the intermediate chronotype was the most common category, while students with evening chronotype demonstrated less favorable sleep-related parameters than those with other chronotypes (8). More recent research among undergraduate nursing students has similarly examined chronotype, social jetlag, sleep quality, and academic burnout, indicating that evening preference and poor sleep quality may coexist with adverse academic experiences (9). Studies involving practicing nurses further suggest that the interaction between chronotype and work schedules may influence sleep quality, particularly when an individual's circadian preference is poorly aligned with assigned shifts (10). Although findings from employed nurses cannot be directly generalized to students, they highlight the potential importance of considering both circadian preference and externally imposed schedules when evaluating sleep health in nursing populations.

Despite increasing international attention to sleep quality and chronotype, the available evidence is derived predominantly from populations outside Pakistan. Nursing students in Pakistan may experience a different combination of academic schedules, clinical training requirements, employment responsibilities, lifestyle practices, and sociocultural influences on sleep. The existing manuscript literature provides limited evidence specifically describing chronotype and sleep quality among Post-RN nursing students in a Pakistani educational setting. This represents an important local evidence gap because identifying the distribution of chronotypes and the extent of sleep-quality problems can provide preliminary information for student-health initiatives and guide the design of larger analytical studies. A descriptive assessment is particularly appropriate as an initial step where local data are limited.

Therefore, the present descriptive cross-sectional study was conducted to assess sleep quality and chronotype among Post-RN nursing students at New Advance College of Nursing, Lahore. Specifically, the study aimed to determine the distribution of chronotype categories and describe sleep quality among the participating nursing students. The primary research questions were: which chronotype is most frequently observed among the study participants, and what is the pattern of sleep quality within this nursing-student population?

MATERIAL AND METHODS

A quantitative, descriptive cross-sectional study was conducted at New Advance College of Nursing, Lahore, to assess chronotype and sleep quality among Post-RN nursing students. The cross-sectional design was selected to describe chronotype patterns and sleep characteristics within the study population at a defined period without introducing an intervention or altering participants' usual academic or occupational schedules. The overall research

process extended over approximately nine months following institutional ethical approval, while participant recruitment and questionnaire-based data collection were conducted over a six-week period.

The target population comprised 57 nursing students enrolled at New Advance College of Nursing, Lahore. Students aged 20–34 years who were enrolled in either the first or second year of the Post-RN nursing programme were considered eligible for participation. Students enrolled in programmes other than Post-RN nursing were not included. Participants were recruited using a non-probability convenience sampling technique. All eligible students were informed about the purpose and procedures of the study before participation, and written informed consent was obtained. Participation was voluntary, confidentiality of participants' information was maintained, and participants retained the right to withdraw from the study without penalty.

The required sample size was estimated from the finite population of 57 students using the formula ($n = N / [1 + N(e^2)]$), where (N) represented the population size and (e) represented a 5% margin of error. Substitution of (N=57) and (e=0.05) produced an estimated sample of 49.89, which was rounded to 50 participants. Accordingly, 50 nursing students were included in the study.

Data were collected using a structured questionnaire comprising demographic and general characteristics together with established measures of chronotype and sleep quality. Demographic and contextual information included age, programme level, marital status, alcohol intake, caffeine intake, perceived health status, clinical department, sleeping with a bed partner, experience of taking sleeping medication, study shift, work shift, and subjective sleep-related symptoms. Chronotype and sleep quality constituted the principal study outcomes.

Chronotype was assessed using the 19-item Morningness–Eveningness Questionnaire (MEQ), originally developed to determine individual preference for morning or evening activity patterns (11). The questionnaire contains items addressing preferred waking and sleeping times, morning alertness and tiredness, preferred timing of mental and physical activities, and self-perceived morningness or eveningness. Item responses are assigned predetermined scores and summed to obtain an overall MEQ score ranging from 16 to 86. According to the scoring categories used in the study, scores of 16–30 represent a definite evening type, 31–41 a moderate evening type, 42–58 an intermediate type, 59–69 a moderate morning type, and 70–86 a definite morning type. For descriptive reporting, the five classifications may be interpreted within the broader morning, intermediate, and evening chronotype categories according to their corresponding MEQ score ranges.

Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), an established self-report measure developed to evaluate sleep quality during the preceding month (12). The instrument assesses sleep-related characteristics including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The seven component scores are each rated from 0 to 3 and are summed to produce a global PSQI score ranging from 0 to 21, with higher scores indicating poorer sleep quality. Responses regarding habitual bedtime, time required to fall asleep, usual waking time, actual sleep duration, nocturnal sleep disturbances, use of sleep medication, difficulty remaining awake during daytime activities, daytime enthusiasm, and overall perceived sleep quality were obtained from each participant.

Questionnaires were administered after ethical approval and explanation of the study procedures. Participants were instructed to read each item carefully, provide the response that most accurately reflected their usual experience, answer all questionnaire items, and respond to each MEQ item independently. Data collection was based on self-reported information, and the same structured instruments and response formats were used for all participants to maintain consistency in measurement.

Collected data were entered and analyzed using IBM SPSS Statistics version 26.0. Because the study was designed and reported as a descriptive cross-sectional assessment, categorical variables were summarized using frequencies and percentages. Demographic characteristics, questionnaire responses, chronotype categories, and sleep-quality characteristics were therefore described using their corresponding participant counts and proportions. No intervention comparisons, longitudinal analyses, multivariable models, or adjusted effect estimates formed part of the reported analytical approach.

The study was approved by the Ethical Review Committee of New Advance College of Nursing, Lahore. Ethical principles of voluntary participation, informed consent, privacy, confidentiality, and the right to withdraw were

observed throughout the research process. Participants provided written consent before completing the study questionnaire, and collected information was intended solely for research purposes.

RESULTS

A total of 50 Post-RN nursing students were included in the analysis. Participants were distributed across the predefined age categories from 20 to 34 years, with the largest proportion aged 29–31 years (24.0%), followed by 26–28 years (22.0%). Most participants were second-year Post-RN students (62.0%) and unmarried (84.0%). All participants reported caffeine intake, whereas none reported alcohol intake. Most rated their health as poor or neutral (80.0%), and 72.0% were working in the emergency department. Ninety percent reported sleeping with a bed partner. Regarding occupational schedules, half of the participants worked evening shifts and half worked night shifts, while all attended a morning study shift. Thirty percent reported experience of taking sleeping pills. Participant characteristics are summarized in Table 1.

Table 1. Demographic, Academic, and Work-Related Characteristics of Participants (N=50)

Characteristic	Category	n (%)
Age, years	20–22	10 (20.0)
	23–25	9 (18.0)
	26–28	11 (22.0)
	29–31	12 (24.0)
	32–34	8 (16.0)
Programme level	Post-RN first year	19 (38.0)
	Post-RN second year	31 (62.0)
Marital status	Married	8 (16.0)
	Unmarried	42 (84.0)
Alcohol intake	Yes	0 (0.0)
	No	50 (100.0)
Caffeine intake	Yes	50 (100.0)
	No	0 (0.0)
Perceived health status	Poor/neutral	40 (80.0)
	Good	10 (20.0)
Clinical department	ICU	5 (10.0)
	Emergency department	36 (72.0)
	General wards	9 (18.0)
Bed partner	Yes	45 (90.0)
	No	5 (10.0)
Previous use of sleeping pills	Yes	15 (30.0)
	No	35 (70.0)
Study shift	Morning	50 (100.0)
	Evening	0 (0.0)
Work shift	Morning	0 (0.0)
	Evening	25 (50.0)
	Night	25 (50.0)
Reported sleep-related symptom	Daytime sleepiness	15 (30.0)
	Insomnia severity	35 (70.0)

ICU, intensive care unit.

Responses to the Morningness–Eveningness Questionnaire demonstrated a tendency toward later preferred sleep and activity times on several individual items. More than half of participants (56.0%) reported that, in the absence of next-day commitments, they would go to bed more than two hours later than usual. Difficulty waking was common, with 88.0% reporting that getting up in the morning was “not at all easy,” and 60.0% described themselves as not at all or only slightly alert during the first half-hour after waking. When asked about their preferred time for feeling at their best, 56.0% selected a period after 5:00 PM. On direct self-identification, 70.0% described themselves as either more evening-oriented than morning-oriented or definitely evening type. Selected MEQ responses are presented in Table 2.

Table 2. Selected Morningness–Eveningness Questionnaire Responses (N=50)

MEQ item	Response	n (%)
Preferred waking time if free to plan the day	7:45–9:45 AM	12 (24.0)
	9:45–11:00 AM	16 (32.0)
	11:00 AM–12:00 noon	22 (44.0)
Preferred bedtime if free to plan the evening	8:00–9:00 PM	5 (10.0)
	9:00–10:15 PM	6 (12.0)

MEQ item	Response	n (%)
Ease of getting up in the morning	10:15 PM–12:30 AM	9 (18.0)
	12:30–1:45 AM	12 (24.0)
	1:45–3:00 AM	18 (36.0)
	Not at all easy	44 (88.0)
	Not very easy	3 (6.0)
	Fairly easy	2 (4.0)
Alertness during first 30 minutes after waking	Very easy	1 (2.0)
	Not at all alert	21 (42.0)
	Slightly alert	9 (18.0)
	Fairly alert	15 (30.0)
	Very alert	5 (10.0)
Bedtime without next-day commitments	Seldom/never later	10 (20.0)
	<1 hour later	4 (8.0)
	1–2 hours later	8 (16.0)
	>2 hours later	28 (56.0)
Preferred time of peak functioning	5:00–8:00 AM	6 (12.0)
	8:00–10:00 AM	7 (14.0)
	10:00 AM–5:00 PM	9 (18.0)
	5:00–10:00 PM	12 (24.0)
	10:00 PM–5:00 AM	16 (32.0)
Self-perceived chronotype	Definitely morning type	6 (12.0)
	More morning than evening type	9 (18.0)
	More evening than morning type	12 (24.0)
	Definitely evening type	23 (46.0)

MEQ, Morningness–Eveningness Questionnaire.

Sleep-related responses indicated a substantial burden of short sleep duration, prolonged sleep latency, and unfavorable subjective sleep quality. Thirty-six participants (72.0%) required more than 30 minutes to fall asleep, while 32 (64.0%) reported sleeping for fewer than five hours per night. Overall, 46 participants (92.0%) reported sleeping for fewer than seven hours, whereas only four (8.0%) reported more than seven hours of sleep. Late bedtimes were also frequent, with 30 participants (60.0%) usually going to bed after 12:45 AM.

Sleep-medication use during the preceding month was common: 47 participants (94.0%) reported at least some use, including 29 (58.0%) who reported taking sleep medication at least once per week. Difficulties with daytime wakefulness were also frequent; 42 participants (84.0%) reported at least some difficulty staying awake while driving, eating, or participating in social activities during the preceding month, and 30 (60.0%) experienced this at least once per week. Forty-eight participants (96.0%) reported some degree of difficulty maintaining enthusiasm for daily activities. In the direct subjective sleep-quality item, four participants (8.0%) rated their sleep as fairly good, 34 (68.0%) as fairly bad, and 12 (24.0%) as very bad; none rated their sleep as very good. Accordingly, 46 of 50 participants (92.0%) directly rated their overall sleep quality as fairly bad or very bad. Detailed sleep-related responses are presented in Table 3.

Table 3. Sleep Characteristics Reported by Participants (N=50)

Sleep characteristic	Category	n (%)
Usual bedtime	8:00–9:00 PM	6 (12.0)
	9:00–10:15 PM	4 (8.0)
	10:15 PM–12:45 AM	10 (20.0)
	12:45–2:00 AM	22 (44.0)
	2:00–3:00 AM	8 (16.0)
Sleep latency	≤15 min	2 (4.0)
	16–30 min	12 (24.0)
	31–60 min	22 (44.0)
	>60 min	14 (28.0)
Actual nightly sleep duration	<5 h	32 (64.0)
	5–6 h	6 (12.0)
	6–7 h	8 (16.0)
	>7 h	4 (8.0)
Sleep medication use during past month	Not during past month	3 (6.0)
	Less than once/week	18 (36.0)
	Once or twice/week	22 (44.0)
	Three or more times/week	7 (14.0)
Difficulty staying awake during past month	Not during past month	8 (16.0)
	Less than once/week	12 (24.0)
	Once or twice/week	17 (34.0)

Sleep characteristic	Category	n (%)
Difficulty maintaining enthusiasm	Three or more times/week	13 (26.0)
	Not during past month	2 (4.0)
	Less than once/week	4 (8.0)
	Once or twice/week	34 (68.0)
	Three or more times/week	10 (20.0)
Overall subjective sleep quality	Very good	0 (0.0)
	Fairly good	4 (8.0)
	Fairly bad	34 (68.0)
	Very bad	12 (24.0)

The item-level sleep findings therefore consistently demonstrated short sleep duration, delayed sleep onset, late habitual bedtimes, frequent use of sleep medication, daytime wakefulness difficulties, and unfavorable subjective sleep quality. The most pronounced descriptive findings were sleep duration below five hours in 64.0% of participants, sleep latency exceeding 30 minutes in 72.0%, habitual bedtime after 12:45 AM in 60.0%, and fairly bad or very bad subjective sleep quality in 92.0%. These findings describe the sleep characteristics of the study sample without implying causation or a statistically tested association between chronotype and sleep quality.

DISCUSSION

The present study identified a pattern of unfavorable sleep characteristics and later circadian preference among Post-RN nursing students at New Advance College of Nursing, Lahore. Participants commonly reported delayed preferred sleep and activity timing, difficulty waking in the morning, reduced morning alertness, short nocturnal sleep duration, prolonged sleep latency, and poor subjective sleep quality. In particular, most participants directly described themselves as more evening-oriented than morning-oriented, while the sleep-related responses indicated substantial difficulty obtaining adequate and satisfactory sleep. Because the study was descriptive and cross-sectional, these findings characterize the sleep and circadian patterns of the sampled students but do not establish that chronotype caused poor sleep or that the two outcomes were statistically associated (11).

The tendency toward evening-oriented behavior observed in the individual MEQ responses is broadly consistent with previous evidence showing that later chronotypes may be associated with less favorable sleep characteristics in young adults and university students. Li et al. reported relationships among chronotype, sleep characteristics, and depressive symptoms in Chinese college students, suggesting that later circadian preference may coexist with adverse sleep patterns (12,13). Zhang et al. similarly reported an association between chronotype and depressive symptoms in college students, with sleep quality contributing to this relationship (14). Biological chronotype reflects individual variation in circadian timing and preferred periods of sleep and activity, and evening-oriented individuals may experience difficulty when externally imposed schedules require early waking or daytime performance (15). Such circadian misalignment may be particularly relevant to nursing students who combine morning academic schedules with clinical or employment responsibilities.

The findings are also comparable with previous research specifically involving nursing students. Ota et al. found that intermediate chronotype was the most frequently observed category among Japanese nursing students and reported less favorable sleep-related parameters among students with an evening chronotype (16). Although the present data cannot support a definitive MEQ-derived distribution of chronotype categories, several individual responses indicated later sleep preference: many participants preferred late bedtimes, experienced difficulty rising in the morning, and selected evening or nighttime periods as their preferred time of peak functioning. Hakimi et al. likewise demonstrated that chronotype and poor sleep quality were relevant characteristics among undergraduate nursing students and examined their relationship with academic burnout (17). Together, these studies and the present descriptive findings support the importance of considering circadian preference when examining sleep health in nursing-student populations.

Sleep duration and sleep initiation emerged as particularly important concerns. Almost two-thirds of the participants reported sleeping for fewer than five hours per night, while a substantial majority required more than 30 minutes to fall asleep. These patterns are consistent with the broader literature showing that nursing and university students may experience sleep disturbance in the context of academic workload, stress, irregular routines, and demanding schedules (18,19). Short sleep and delayed sleep onset may also reflect a mismatch between an individual's preferred circadian timing and required morning activities. Chronotype is influenced by endogenous circadian processes as well as behavioral and environmental factors, and evening preference can make early schedules more difficult to maintain without reducing sleep opportunity (20,21). However, because sleep

schedules, stress, workload, and other potential determinants were not examined analytically in the present study, these mechanisms remain plausible explanations rather than demonstrated causes.

The high proportion of participants reporting fairly bad or very bad subjective sleep quality is clinically relevant because perceived sleep quality reflects several dimensions of sleep experience beyond sleep duration alone (22). Sleep-medication use and difficulty maintaining daytime wakefulness were also frequently reported, suggesting that sleep disturbance may extend into daytime functioning. Similar concerns have been reported among nursing students in previous research, where sleep problems have been associated with academic functioning and other adverse student outcomes (23,24). Nevertheless, the present study did not directly assess academic performance, psychological disorders, burnout, or clinical performance, and these consequences should therefore not be inferred from the current data.

Work and study scheduling may also be relevant to the observed sleep pattern. All participants attended a morning study shift, while the reported work schedules were divided between evening and night shifts. Research among practicing nurses has demonstrated that sleep quality can differ according to chronotype and shift timing, particularly when work schedules conflict with individual circadian preference (25). Although findings from working nurses cannot be directly extrapolated to nursing students, they provide a plausible context for interpreting the combination of morning academic requirements, evening or night work schedules, and late circadian preferences observed in this sample. The cross-sectional design and absence of participant-level association analyses, however, prevent determination of whether work shift, chronotype, or other factors independently contributed to the reported sleep characteristics.

These findings have practical implications for nursing education and student health. The combination of short sleep, prolonged sleep latency, unfavorable subjective sleep quality, and daytime wakefulness difficulties indicates that sleep health deserves greater attention within nursing-student populations. Educational institutions may benefit from increasing awareness of healthy sleep practices, circadian regularity, and the potential challenges created by competing academic and work schedules. However, the present study did not evaluate any intervention, scheduling strategy, or educational programme; therefore, the effectiveness of specific institutional measures cannot be concluded from these data.

The study has several strengths. It focused on an understudied nursing-student population in a Pakistani educational setting and used established instruments addressing both chronotype and sleep quality. The study also captured several contextual variables, including academic year, clinical department, study schedule, work shift, caffeine intake, and sleeping-medication experience. At the same time, important limitations should be considered. The sample was small, selected through convenience sampling, and drawn from a single institution, which limits generalizability. The cross-sectional design prevents assessment of temporal or causal relationships. Sleep and chronotype information was self-reported and may therefore be affected by recall or reporting bias. Potential confounding factors were not examined using multivariable analysis, and no inferential testing was reported to determine relationships between chronotype, sleep quality, work schedules, or demographic characteristics. In addition, the available aggregate data did not permit reconstruction of valid participant-level global PSQI scores or definitive MEQ-derived chronotype categories. Consequently, interpretation is most appropriately restricted to the directly reported questionnaire responses and descriptive sleep and circadian characteristics.

CONCLUSION

Among Post-RN nursing students at New Advance College of Nursing, Lahore, the reported sleep pattern was characterized by short sleep duration, prolonged sleep latency, unfavorable subjective sleep quality, difficulty with daytime wakefulness, and a tendency toward later preferred sleep and activity timing. These findings indicate a substantial burden of sleep-related problems within the sampled students and support the importance of recognizing sleep health and circadian preference as relevant student-wellness concerns. Because the study was descriptive and cross-sectional, the findings should be interpreted as characteristics of this sample rather than evidence of a causal relationship between chronotype and sleep quality.

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