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Sleep Quality and Patterns Among Postgraduate Students of Tribhuvan University

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Abstracts

Sleep is a vital physiological process essential for cognitive performance, emotional regulation, and overall well-being. University students are particularly vulnerable to poor sleep quality due to academic pressure, lifestyle habits, and excessive screen exposure. Ayurveda, the science of life regards Nidra (sleep) as one of the Tri-Upasthambha (three pillars of health), along with diet (Ahara) and regulated celibate lifestyle (Bramcharya). Disturbances in sleep are understood to contribute to imbalance in bodily humors (Doshas), especially Vata and Pitta, which may manifest as anxiety, overthinking, fatigue, reduced concentration, and mood instability. A cross-sectional study was conducted among 30 postgraduate students from various faculties of Tribhuvan University using a non-probability sampling technique to assess the patterns and determinants of sleep habits. Data were collected through a semi-structured questionnaire, including the Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS). Quantitative data were analyzed to determine sleep patterns and influencing factors. Poor sleep quality and irregular sleep schedules are found prevalent among postgraduate students. 43.3% of students were habitual in delayed sleep and 26.7% reported electric devices use as a major factor affecting sleep quality. The findings indicate that irregular sleep patterns, academic workload, and digital media use significantly impact sleep quality among university students. Academic stress, exam pressure, dietary irregularities, late-night screen exposure and caffeine consumption emerged as major contributors to poor sleep quality. These results align with global research highlighting stress, anxiety, and electronic device use as key determinants of sleep disruption in student populations. The integration of Ayurveda-based lifestyle interventions such as regulated daily routines (Dinacharya), Yoga, reduced screen exposure, and stress management techniques could serve as holistic strategies for improving sleep health.

Keywords: Sleep habits, *Nidra*, Ayurveda, sleep patterns, sleep quality, academic stress.

Introduction

Sleep is a fundamental biological process essential for human health, cognitive functioning, emotional balance, and overall well-being. Sleep is an inherent basic human need as well as a component of an individual's health and it is influenced by several factors relating to physical,

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mental and environment (Lawson *et al.,* 2019). Sleep quality refers to the subjective satisfaction with the sleep experience, including sleep onset, sleep continuity, sleep duration, and the sense of refreshment after awakening (Kline, 2020). Epidemiological studies indicate that chronic sleep insufficiency contributes to increased risks of cardiovascular disorders, metabolic syndrome, obesity, lowered immune resistance, migraines, anxiety, and depression (Chattu *et al.,* 2018). Sleepiness is defined as the inability or difficulty in maintaining alertness during the major wake period of the day, resulting in unintended lapses into drowsiness or sleep. (American Academy of Sleep Medicine, 2014). Adequate sleep is strongly linked to better physical health outcomes, optimal mental function, and improved academic performance among students. It is important to note that sleepiness is often circumstance-dependent, with many aspects of the students' learning environment exacerbating sleepiness. Sleep deprivation is defined as obtaining inadequate sleep to support adequate daytime alertness (Kryger *et al.,* 2010). Sleep is believed to have a facilitating role in the learning and memory process (Rasch & Born, 2013). Sleep deprivation experiments conducted on humans have shown that sleep deprivation causes impairment of performance, vigilance, attention, concentration, and memory (Alhola & Polo-Kantola, 2007). Individuals' sleep habit is measured using sleep quality, sleep duration, regular sleep-wake cycle and daytime sleepiness in different population groups. Proper sleep aids in the optimum functioning of the brain, which consequently helps to improve knowledge and grasp new concepts. The problem of poor sleep quality is faced by university students where academic demand is fairly high (Schmickler *et al.,* 2023). Research across global university populations consistently reports high rates of poor sleep quality. Studies reveal that 24% of students in the United Kingdom, 30% of students in Korea, and 49% of Taiwanese college students sleep less than seven hours per night (Webb *et al.,* 1996; Ban & Lee, 2001; Tsai & Li, 2004). Poor sleep is closely associated with reduced academic performance, fatigue, lower classroom attention, and decreased motivation, yet many students remain unaware of the negative consequences of their sleep behavior (Pilcher & Walters, 1997). In Nepal, studies have reported prevalence rates of poor sleep quality of 44.2%, 30.3% among medical students and 35.4% among non-medical undergraduates (Sundas *et al.,* 2020; Shrestha *et al.,* 2021; Bhandari *et al.,* 2017).

Ayurveda classifies sleep (*Nidra*) as one of the *Tri-Upasthambha* (three supporting pillars of health), alongside diet (*Ahara*) and regulated celibacy/control of senses(*Brahmacharya*) (Charaka Samhita, Sutrasthana 11/35). Adequate sleep nurtures *Ojas*, the vital essence responsible for immunity, emotional stability, and mental clarity (Sharma *et al.,* 2024). Sleep disturbances are understood to result primarily from imbalances in *Vata* and *Pitta* doshas. Excess mental activity, irregular study schedules, late-night exposure to screens, stimulants (such as caffeine), heavy or late dinners, and sedentary habits aggravate *Vata*, leading to insomnia, restlessness, worrying, and difficulty falling asleep. Increased *Pitta* may result in early awakening, irritability, and emotional agitation (Haque,2024). This study was done with the objective to assess the patterns, and determinants of sleep habits among postgraduate students.

Materials And Methods

A cross-sectional study design was employed, involving 30 post-graduate students from various faculties of Tribhuvan University central departments at Kirtipur using a quantitative method via non-probability sampling in Feb and March 2025. The study included postgraduate students studying in the different central departments of Tribhuvan University who were willing to participate and provided informed consent. Students with known medical conditions or those taking sleep-altering medications were excluded. Data were collected using a semi-structured

questionnaire. The semi-structured questionnaire was administered in person, and participants took approximately 10–12 minutes to complete it. The questionnaire contained demographic information, lifestyle habits, and standardized sleep assessment tools. The Pittsburgh Sleep Quality Index (PSQI) (Smyth, 1999) and Epworth Sleepiness Scale (ESS) (Johns, 1991) were used to evaluate patterns and determinants of sleep habits among students.

Results

Data were collected by using a non-probability sampling method from students with mean age 24.90 years (range = 22–29). The demographic Characteristics of students is shown in Table 1.

Table 1

Demographic Characteristics

Variable	Category	n	%
Gender	Male	19	63.3
	Female	11	36.7
Living arrangement	Living alone	14	46.7
	With family	6	20.0
	Hostel	6	20.0
	Sharing with friends	3	10.0
Faculty	Chemistry	10	33.3
	Agriculture	5	16.7
	Management	4	13.3
	MPA	3	10.0
	Others	8	26.7
Year of study	First year	26	86.7
	Second year	4	13.3

Out of the total 30 participants, 19 participants (63.3%) were male, and the remaining 11 (36.7%) were female. Most of the participants were living alone currently (46.7%). The time usually spent going to bed at night during the past month was 10 pm (56.7%). Only 26.7% of them had the habit of falling asleep within 15 minutes after going to bed. While others it took longer time. 20% of the participants had 6 am as the usual time of waking up in the morning while others wake up late. During the past month, 23.3% had 7 hours of sleep. About 22 participants (73.3%) take naps during the day; most of them take less than 30 mins (46.7%). Although the mean sleep duration was 7.1 hours the majority of participants had a slight chance of nodding off when sitting and reading (40%), as well as when in a vehicle (30%). Sleep pattern characteristics of students is shown in Table 2.

Table 2

Sleep Pattern Characteristics

Variable	Category	n	%
Usual bedtime	10:00 PM	17	56.7
	10:30 PM	6	20.0

Variable	Category	n	%
	11:00 PM–12:00 AM	7	23.3
Sleep latency	≤15 minutes	14	46.7
	20–30 minutes	8	26.7
	>30 minutes	9	30.0
Wake-up time	5:00–6:00 AM	13	43.3
	6:30–7:00 AM	7	23.3
	Other times	10	33.3
Total sleep duration	7 hours	22	73.3
	8 hours	20	20.0
Daytime napping	Yes	22	73.3
Nap duration	<30 minutes	14	46.7
	30–60 minutes	7	23.3
	>1 hour	2	6.7

Most of the participants consume caffeine (40%) and engage in physical activities daily (43.3%). Many of them spend more than 6 hours on academic activities (43.3%), and use electronic devices (96.7%). Most of them use electronic devices about 30 minutes before bed (43.3%). Most of the student's experience academic stress (46.7%), stress/anxiety (46.7%), overthinking (40%), noise or light could affect sleep, but they can manage (50%). The biggest factor that affected the sleep quality of the participants was found to the exam stress, and electronic device use, which were about 26.7% each, followed by overthinking and academic stress, about 10% each. Table 3 present the influencing factors of sleep quality.

Table 3

Determinants Influencing Sleep Quality

Determinant	n	%
Caffeine consumption daily	12	40.0
Electronic device use before sleep	29	96.7
Immediate Screen-free interval before bed	9	30.0
Academic stress affecting sleep	14	46.7
Stress or anxiety Sometimes/Often	17	56.7
Environmental disturbance (noise/light)	24	80.0
Exam stress as major factors affecting sleep	8	26.7
Electronic device use before sleep as major factors affecting sleep	8	26.7
Overthinking factor affecting sleep	3	10

Discussion

The findings of this study reveal that excessive use of electronic devices and academic stress are major contributors to disrupted sleep patterns among postgraduate students. The assessment of patterns and determinants of sleep habits among students of Tribhuvan University reveal significant

insights into sleep habits, and the factors influencing them. The study found that the majority of students experienced irregular sleep patterns. This aligns with previous research conducted in similar university settings, where academic workload, and digital media use were commonly cited as causes of delayed sleep onset. About the global context, several studies have demonstrated that university-level students from different countries slept less than 7 hours per night (Paudel *et al.,* 2022). In this study it is seen that most of the participants were living alone currently (46.7%). Previous studies have shown that living alone and the absence of social participation are associated with poorer mental health (Oshio, & Kan, 2019). The time usually spent going to bed at night during the past month was 10 pm (56.7%). Only 26.7% of participants could fall asleep within 15 minutes after going to bed suggesting poor quality sleep in majority. The participants reported falling asleep within 15 min are considered as healthy sleep in earlier studies also (Ohayon, & Sagales, 2010). About 22 participants (73.3%) take naps during the day; most of them take less than 30 mins (46.7%). Daytime napping is a common lifestyle in china and daytime napping were more likely to develop obesity and diabetes than those without napping (Dai *et al.,* 2023). Ayurveda lifestyle also suggest for daytime napping only during summer. 40% participants had a slight chance of nodding off when sitting and reading suggesting the poor quality sleep. A Study suggest that daytime sleepiness is a major problem, exhibited by 50% of college students compared to 36% of adolescents and adults, where university students had more flexible timetables (Hershner & Chervin,2014). 40% of the participants consume caffeine and only 43.3 % were engage in physical activities daily. Many of them spend more than 6 hours on academic activities (43.3%) with limited physical activity. University students show a decrease in physical activity during high school and become worse when starting higher education and, thus, tend to adopt a sedentary lifestyle (Wu *et al.,* 2023). Most of them use electronic devices more than 30 minutes before bed (43.3%) which suggest towards irregular quality sleep. The use of electronic devices such as smartphones, computers, laptops, and tablets has increased significantly. Longer electronic devices use duration before bedtime is associated with poorer sleep quality. Previous study suggests using electronic devices for less than 30 min before bedtime may be acceptable among university student in order to reach good sleep quality, but overuse should be avoided (Pham et al 2021). The biggest factor that affected the sleep quality of the participants was found to the exam stress, stress, and electronic device use, which were about 26.7% each, followed by overthinking and academic stress, about 10% each. Study among Korean university students 30.2% reported having insufficient sleep and about one third of them pointed to visual media, including computers, as the primary reason (Ban & Lee 2001). A cross-sectional online survey done in Midwestern University students reported disturbed sleep; over 60% were categorized as poor-quality sleepers by the PSQI, bedtimes and rise times were delayed during weekends, and students reported frequently taking prescription, over-the-counter, and recreational psychoactive drugs to alter sleep/wakefulness. Students overwhelmingly stated that emotional and academic stress negatively impacted sleep, whereas exercise, alcohol and caffeine consumption, and consistency of sleep schedule were not significant predictors of sleep quality (Lund *et al.,* 2010). Whereas in this study students have not taken prescriptions, not even over the counter, or recreational psychoactive drugs to alter sleep/wakefulness. Students overwhelmingly stated that emotional and academic stress negatively impacted sleep. The use of electronic devices was stated to be the biggest factor affecting sleep quality. Whereas exercise and caffeine consumption were also the key determinants influencing sleep patterns. The prevalence of poor sleep quality was 55.8% in university students in Ethiopia. Perceived stress level and symptoms of depression and anxiety were strongly associated with sleep quality (Lemma *et al.,* 2012). The prevalence of medical conditions like insomnia is seen

in the students of Southeastern and Southwestern universities. (Paudel *et al.,* 2020). Whereas any medical conditions, like insomnia, are not seen in the Nepalese students. Overall, the study shows that patterns and determinants of sleep habits among students of Tribhuvan University were more likely to be affected by the use of electronic devices excessively, academic stress, overthinking, caffeine consumption, and irregular sleep schedules having prevalence of napping and nodding off.

From an *Ayurveda* perspective, unhealthy behaviors aggravate *Vata* and disturb the natural circadian rhythm (*Dinacharya*), leading to impaired mental clarity (*Dhi*), retention (*Driti*), and memory (*Smriti*). Ayurveda promotes *Dinacharya* (daily routines)—including early rising, regulated study-work-rest cycles, light and warm evening meals, minimizing screen time before bed, and practicing calming techniques such as *Yoga, Pranayama*, meditation, and *Abhyanga* (warm oil massage)—to regulate sleep-wake rhythms.(Nair *et al.,* 2021). Herbal interventions such as *Ashwagandha* (*Withania somnifera*), *Brahmi* (*Bacopa monnieri*), *Tagara* (*Valeriana wallichii*), and *Jatamansi* (*Nardostachys jatamansi*) are prescribed as *Medhya Rasayana* (neurotonic and stress-relieving rejuvenatives) that promote relaxation, reduce stress, and improve sleep quality (Singh, 2018). Institutional interventions, including awareness programs, student counseling services, stress management workshops, yoga and meditation sessions, and evidence-based lifestyle guidance, are crucial to fostering healthier sleep patterns among university students. Thus, integrating modern sleep hygiene measures with Ayurveda-based lifestyle regulation and herbal support may offer a holistic approach to improving sleep quality among university.

Limitations Of The Study

In this study due to constraints in time and resources, field-level validation, multicenter data collection, or large-scale assessments and long-term follow-up data was not done. The small sample size (n=30) limits the generalizability of the findings across all postgraduate students. The findings relied on self-reported data, which may be influenced by recall bias. Additionally, the study was confined to a single university setting, which may not represent the broader Nepalese student population.

Conclusion

Sleep patterns such as irregular sleep schedules were prevalent across various faculties where taking naps and nodding off was prevalent. Key determinants influencing these patterns included academic workload, screen time, caffeine consumption, and exam stress. Poor sleep quality is the issues because of the influence of behavioral, environmental, and psychological factors which have potential implications for students' academic performance, mental well-being, and overall health. This study highlights the need for targeted interventions addressing sleep hygiene, academic stress, and lifestyle habits among university students.

Recommendation

Future studies using standardized tools, larger sample sizes, and mixed-method or clinical designs is recommended to strengthen the evidence base. Initiatives promoting good sleep hygiene, such as reducing screen time before bed, establishing consistent sleep routines, and limiting caffeine intake should be encouraged through workshops and digital campaigns by promoting healthy lifestyle. Ayurveda interventions such as weekly yoga and meditation sessions, relaxation techniques, should be started.

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Conflict Of Interest

No conflict of interest.

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