International Journal of Community Medicine and Public Health
Sharma S et al. Int J Community Med Public Health. 2025 Aug;12(8):3724-3732
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20252487

Original Research Article

Assessment of sleep quality, daytime sleepiness, and sleep hygiene practices among adults in a metropolitan city: a cross-sectional study

Sakshi Sharma[1]*, Kunal Chatterjee[1], T. K. Rath[2], Saurabh Mahajan[3], Indranil Samanta[4], Akshay Misra[5], Somesh M. Kaul[1]

[1]Department of Community Medicine, AFMC, Pune, Maharashtra, India
[2]Col Health, Base Hospital, Delhi Cantonment, Delhi, India
[3]Station Health Organisation (Large), Shakurbasti, Delhi, India
[4]Station Health Organisation (Large), Delhi Cantonment, Delhi, India
[5]Department of Hospital Administration, AFMC, Pune, Maharashtra, India

Received: 02 June 2025
Revised: 22 July 2025
Accepted: 23 July 2025

***Correspondence:**
Dr. Sakshi Sharma,
E-mail: sakshi99100@gmail.com

ABSTRACT

Background: Adequate sleep is crucial for cognitive function, workplace performance, and mental health in adults. However, various factors, including workplace pressure, technology use, and sociocultural norms, can significantly impact sleep patterns, particularly in urban settings. This cross-sectional study assessed sleep quality, daytime sleepiness prevalence, and sleep hygiene practices among adults in an urban community in Delhi (Northern India), and the factors associated with these sleep parameters in this understudied population.
Methods: A cross-sectional study was conducted among 384 adults who were assessed using a self-reported proforma of sociodemographic details, behavioral factors, Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and Sleep Hygiene questionnaire.
Results: Of the 384 participants, 72.1% (277 out of 384 participants) were classified as having poor sleep quality (PSQI ≥5), and 29.4% reported excessive daytime sleepiness (ESS ≥10). Poor sleep hygiene behaviors were notably prevalent, with 65.1% of adults reporting reading in bed, 54.7% watching television in bed, and 46.9% eating in bed.
Conclusions: This study highlights the significant prevalence of poor sleep quality and excessive daytime sleepiness among adults in an urban community in Northern India. Factors such as irregular sleep-wake schedules, screen use before bedtime, internet addiction and high workloads adversely affect sleep health.

Keywords: Sleep quality, Sleep hygiene, Daytime sleepiness, Pittsburgh Sleep Quality Index, Adults

INTRODUCTION

Sleep is a fundamental physiological process essential for optimal cognitive function, emotional stability, metabolic health, and overall well-being.[1,2] Poor sleep quality and excessive daytime sleepiness can significantly impair reaction times, decision-making ability, situational awareness, daytime fatigue, cognitive impairment, and mood alterations, potentially leading to long-term health consequences.[3] Inadequate sleep hygiene, including irregular sleep schedules, consumption of stimulants, and exposure to screens before bedtime, has been identified as a modifiable contributor to poor sleep outcomes.[4-6] Despite the importance of sleep, very few studies have comprehensively assessed sleep health parameters such as sleep quality, daytime sleepiness, and sleep hygiene practices among adults in Indian urban settings. It introduces additional challenges such as increased screen time, commuting stress, and socio-cultural obligations, which may further impact sleep patterns.[7]

This study aims to fill this knowledge gap by evaluating these parameters among adults in an urban community of North India and identifying sociodemographic and behavioural predictors associated with sleep disturbances.[8] Inadequate sleep is linked to an increased risk of various physical and mental health conditions, including depression, anxiety, dementia, obesity, hypertension, cardiovascular diseases, and stroke.[9] Sleep is essential for optimal brain function and supports the physiological health of multiple body systems.[10] Sleep-related problems are highly prevalent and often involve both insufficient sleep duration and poor sleep quality.[11-15]

Urban environments like Delhi are known for their high population density, structured routines, and increasing screen time exposure—all of which can significantly affect sleep health. Residential zones within such urban setups offer a unique setting to study these influences. Contemporary lifestyle factors and environmental conditions increasingly influence adult sleep patterns, potentially compromising sleep hygiene and quality and leading to excessive daytime sleepiness. Sleep hygiene refers to the behavioural and environmental practices that promote healthy sleep.

This study aimed to assess sleep quality, prevalence of daytime sleepiness, and sleep hygiene practices among adults in an urban community in Delhi. Furthermore, the study examined the underlying factors contributing to variations in sleep quality and levels of daytime sleepiness within this population.

Study objectives

Primary objective of the study was to assess the prevalence of poor sleep quality, excessive daytime sleepiness, and poor sleep hygiene among adults in an urban community.

Secondary objectives of the study were: to determine the associations between sleep quality, sleep hygiene, and daytime sleepiness, and to identify the socio-demographic and predictors of poor sleep health.

Operational definitions for the study are as follows.

Sleep quality

"A subjective evaluation of how well one sleeps, typically measured through parameters like sleep latency, duration, disturbances, and daytime function" *(Buysse et al, 1989 – PSQI).*

Daytime sleepiness

"The tendency to doze off or fall asleep during the day in inappropriate situations" *(Johns, 1991 – Epworth sleepiness scale).*

Sleep hygiene

"A set of behavioural and environmental recommendations intended to promote healthy, restorative sleep" *(American Sleep Association)*.

METHODS

Study setting and participants

A cross-sectional study was conducted among adults (aged >18 years) residing in an urban community in Delhi (Northern India), over a six-month period from February to July 2025. This urban area provided a suitable environment to assess sleep health in relation to behavioral and lifestyle factors commonly observed in India's metropolitan regions.

Data was collected through face-to-face interviews using pre-validated, structured questionnaires, which were printed and filled out in 10-15 minutes per participant. The questionnaire was translated into Hindi, a regional language, and subsequently validated by language experts to ensure accuracy and cultural relevance. Subjects who self-reported being diagnosed with any form of sleep disorder or were on medications for chronic medical conditions were excluded from the study through specific screening questions incorporated into the questionnaire.

Sample size

Using Cochran's formula for proportions, assuming 50% prevalence of poor sleep quality, sleep hygiene, and daytime sleepiness from the review of literature with a confidence level of 95% and margin of error of 5%, the sample size was 384. Out of the 438 individuals interviewed, 54 reported chronic illnesses and were excluded from the study.

Sampling strategy

This study employed a simple random sampling method. Nominal roll of adults (age >/= 18 years, residing for ≥6 months) who resided in the urban community for at least six months were obtained from the Resident Welfare Associations under the jurisdiction of the Station Health Organization and merged into a master list.

From this consolidated sampling frame, 438 participants were randomly selected using computer-generated random numbers. Participants were approached via their administrative units, informed about the study, and enrolled after receiving their written consent.

Inclusion criteria

Adults aged more than 18 years up to the age of 59 years stationed in the selected urban community for at least a period of >6 months and willing to provid informed consent were included in the study.

Exclusion criteria

Individuals diagnosed with sleep disorders or psychiatric illnesses or taking medications for chronic medical conditions were excluded.

Study tools

The questionnaire consisted of sociodemographic details, behavioral factors, the Epworth sleepiness scale (ESS), the Pittsburgh sleep quality index (PSQI), and sleep hygiene questionnaire.

Sociodemographic questions, including age, gender, number of family members, marital status, income, occupation, and native place of stay, were included.

Behavioral factors, including the time spent online per day, subjective feelings of depressed mood, and workplace performance, were noted.

ESS is an 8-item tool that assesses daytime sleepiness by rating the likelihood of dozing off during daily activities. Each item is scored from 0 to 3, with total scores ranging from 0 to 24. Scores ≥10 indicate excessive daytime sleepiness.[16]

PSQI is a 19-item tool that assesses seven components of sleep: subjective quality, latency, duration, efficiency, disturbances, use of sleep medication, and daytime dysfunction. Each component is scored from 0–3, with a total score ranging from 0–21. A score of more than 5 indicates poor sleep quality.[17,18]

The sleep hygiene questionnaire included a few questions regarding subject habits revolving around bed or immediately before/during bedtime, such as eating, reading, writing, and entertainment.

Statistical analysis

Data was collected, collated, and cleaned using Microsoft Excel. Data was analyzed using statistical package for the social sciences (SPSS) version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used for sociodemographic profiling of the participants. Frequencies and percentages were used to describe categorical variables. Statistical significance was set at $p<0.05$.

RESULTS

The study included 384 adults aged >18 years residing in an urban metropolitan, of whom 23% (n=78) were females and 79.6% (n=306) were males (Table 1). Regarding screen time, 7.03% (n=27) spent one hour per day online, 29.9% (n=115) spent one to two hours, 32.5% (n=125) spent three hours, and 30.4% reported more than four hours of daily screen time.

Daytime sleepiness was observed in various settings. A high to very high chance of dozing was reported by 62.5% of the participants while lying down in the afternoon, 52.6% while sitting and reading, and 48.4% while watching television, highlighting significant somnolence during low-stimulation activities. Only 10.5% reported dozing during conversations, indicating reduced sleepiness in socially engaging contexts. 23.2% reported high to very high daytime sleepiness while being a passenger in a car, suggesting residual fatigue or suboptimal sleep among a subset of the participants.

Figure 1 shows the distribution of participants based on their perceived workplace performance. 75.2% perceive their workplace performance as "excellent." 20.3% rate it as average, indicating a generally positive perception of workplace performance among the participants.

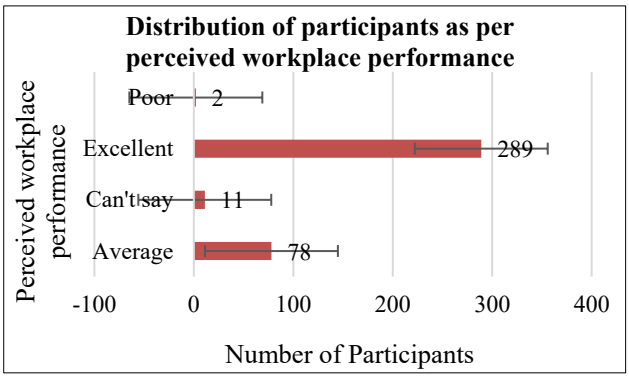

Figure 1: Perceived workplace performance.

Figure 2 shows the distribution of participants according to their perceived sleep quality in the last month. 61.4% reported experiencing headache, low backache, eye pain, or a sensation of heaviness in the head within the past three months. Regarding sleep latency, 27% (n=102) fell asleep within 15 min, 53% (n=203) within 16–30 min, 13% (n=51) within 31–60 min, and 7% (n=28) required more than 60 min to fall asleep (Figure 3).

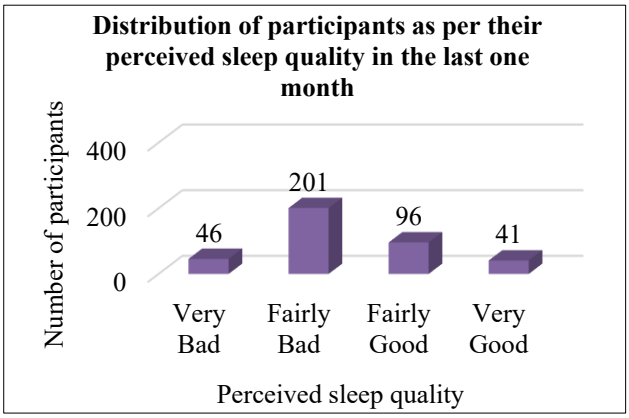

Figure 2: Perceived sleep quality in the last one month.

Figure 4 illustrates the number of participants based on how often they had trouble sleeping within 30 min in the last month.

Based on the PSQI assessment, the study population demonstrated poor overall sleep quality, with a mean global PSQI score of 9.03±3.58, exceeding the clinical cut-off of 5, indicating significant sleep disturbances (Table 2). Component-wise analysis revealed that participants reported moderate issues with subjective sleep quality (mean: 1.34±0.825) and sleep latency (mean: 1.41±0.598), suggesting difficulty in falling asleep and dissatisfaction with their overall sleep experience. Sleep duration (mean: 1.77±0.897) and habitual sleep efficiency (mean: 2.00±1.26) were notably compromised, reflecting shorter sleep hours and inefficient sleep. Sleep disturbances were common (mean: 1.51±0.471), whereas the use of sleeping medications was relatively low (mean: 0.65±0.908). Daytime dysfunction (mean: 1.03±0.90) indicated that a considerable number of individuals experienced impaired alertness and reduced enthusiasm during the day. Collectively, these findings underscore the burden of poor sleep quality and highlight the need for targeted interventions to improve sleep hygiene and mitigate its impact on daily life.

Table 1: Sociodemographic characteristics of the participants (n=384).

Characteristic	Frequency	Percentage
Age (in years)		
21–28	56	14.6
29–35	177	71.1
36–42	79	91.7
43–50	32	8.3
>50	40	10.4
Sex		
Males	306	79.6
Females	78	20.3
Marital status		
Married recently (one month)	11	2.86
Married living with spouse	157	40.8
Married (spouse living elsewhere)	69	17.9
Separated/ divorced	34	8.85
Unmarried	113	29.4
Area of residence (native)		
Urban	263	68.4
Rural	121	31.5
Number of family members		
1	63	16
2	60	16
3	65	17
4	96	25
5	66	17
>5	34	9
Internet usage		
Yes	374	97.3
No	10	2.6
Internet usage per day in hours		
<1	27	7.03
1-2	115	29.9
2-3	125	32.5
>4	117	30.4
Annual household income (as per Kuppuswamy scale 2024)		
≤ ₹10,702	18	4.59
₹10,703–31,977	32	8.16
₹31,978–53,360	61	15.56
₹53,361–80,109	75	19.1
₹80,110–₹1,06,849	101	25.7
₹1,06,850–2,13,813	52	13.2

Continued.

Characteristic	Frequency	Percentage
More than ₹2,13,814	53	13.8
History of any co-morbidities		
Yes	54	14.06
No	330	85.9
History of any medication intake		
Yes	45	14.06
No	339	88.2
Reading in bed		
Yes	233	60.6
No	161	41.9
Watching TV in bed		
Yes	217	56.5
No	167	43.4
Writing in bed		
Yes	121	31.5
No	263	68.4
Eating in bed		
Yes	156	40.6
No	228	59.3
Eating prior to bedtime		
Yes	257	66.9
No	127	33.0

Table 2: Component-wise scores of the Pittsburgh sleep quality index.

Component	Name	Measures	Mean	SD	n	Min-max
1	Subjective sleep quality	How the individual rates their overall sleep quality	1.34	0.825	384	0-3
2	Sleep latency	How long it takes to fall asleep and how often there is difficulty falling asleep	1.41	0.598	384	0-3
3	Sleep duration	Actual number of hours slept per night	1.77	0.897	384	0-3
4	Habitual sleep efficiency	Ratio of actual sleep time to time spent in bed (i.e., % of time sleeping while in bed)	2	1.26	384	0-3
5	Sleep disturbances	Frequency of issues like waking up at night, bathroom use, pain, etc.	1.51	0.471	384	0-3
6	Use of sleeping medication	How often the person takes medication to help sleep	0.65	0.908	384	0-3
7	Daytime dysfunction	Trouble staying awake during daytime and maintaining enthusiasm for daily tasks	1.03	0.90	384	0-3
8	Global PQSI	Total score	9.03	3.58	384	0-21

The comparison of subjective sleep quality scores across different marital status categories revealed significant differences, by Kruskal-Wallis's test. Participants who were married and residing with their spouse reported better subjective sleep quality, whereas those who were separated or divorced exhibited the poorest subjective sleep quality (Figure 5). These findings underscore the potential influence of marital relationships and social support on perceived sleep quality. Both spousal separation and bereavement may negatively impact sleep, whereas being in a stable cohabiting relationship appears to support better sleep quality than being single.

The network plot in Figure 6 presents pairwise comparisons of average ranks for different marital status categories based on a Kruskal-Wallis post hoc test. Each node (0 to 4) represents a group, specifically a marital status category, and the number shown at each node indicates the mean rank of the group.

Red lines indicate a statistically significant difference ($p<0.05$) between the two groups connected by the line, blue lines indicate no statistically significant difference, thicker lines indicate stronger significance (lower p-values), and nodes indicate mean ranks (relative sleep quality scores per marital group).

Post-hoc pairwise comparisons using Dunn-Bonferroni correction revealed that participants who were separated or divorced had significantly poorer sleep quality scores than

those who were unmarried (p<0.05), married with a spouse elsewhere (p<0.05), and widowed (p<0.05). No statistically significant differences were observed between the other marital status groups.

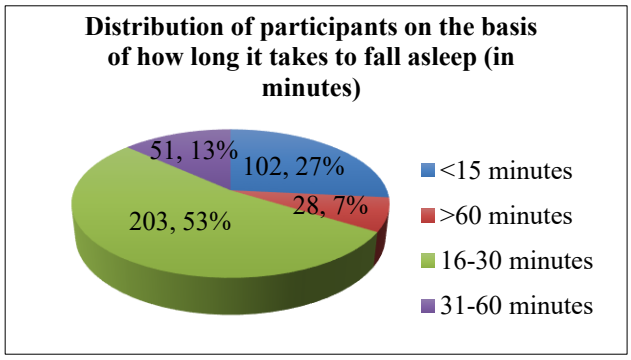

Figure 3: Participants as per sleep latency.

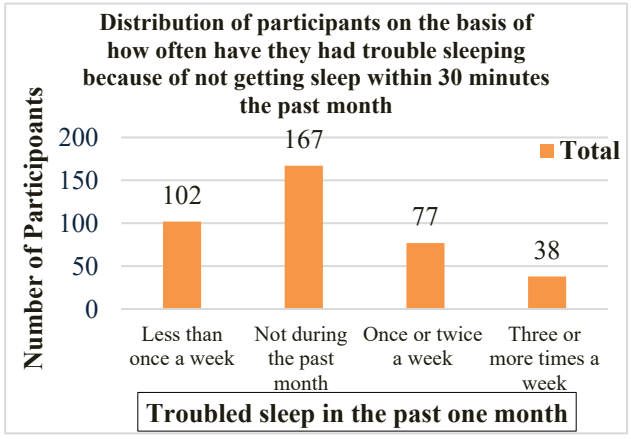

Figure 4: Participants having trouble sleeping because of not getting sleep within 30 minutes the past month.

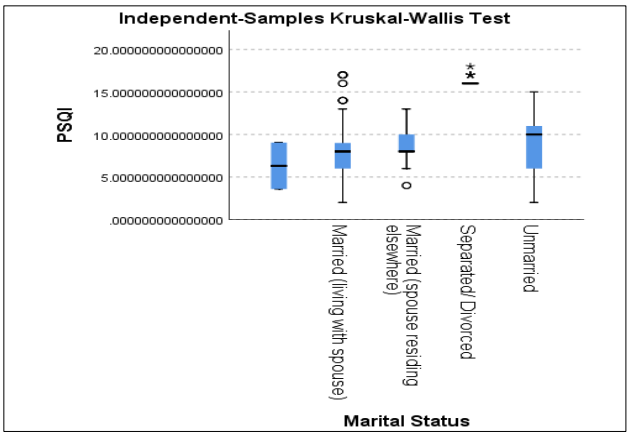

Figure 5: Association between marital status and PSQI scores.

Most participants who were unmarried or living with a spouse had ESS scores of 0–1, indicating a low risk of daytime sleepiness in public places. All 34 divorced/separated participants reported an ESS score of 3, indicating a very high chance of dozing; this was statistically significant. Those who were married but not living with their spouses also showed a relatively higher ESS scores ≥2.

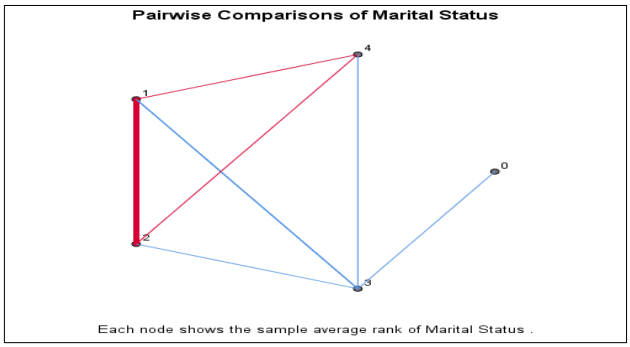

Figure 6: Pairwise comparisons between marital status and PSQI scores.

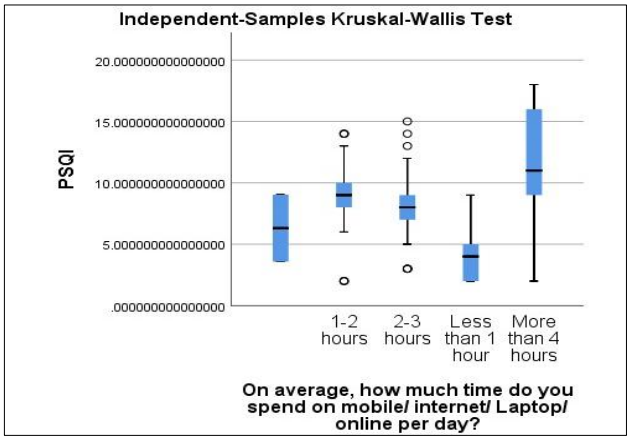

Figure 7: Association between time spent online (screentime) and PSQI scores.

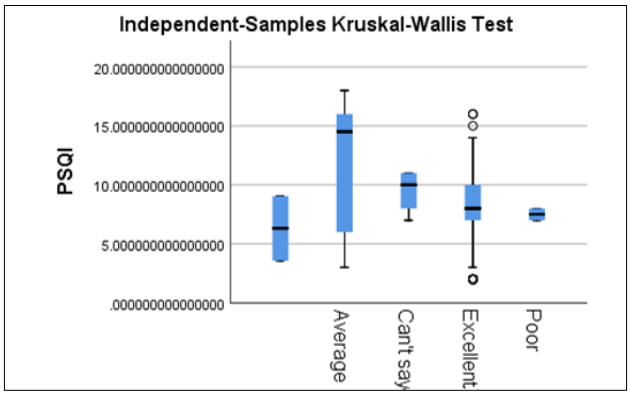

Figure 8: Association between workplace performance and PSQI scores.

Screen time is significantly associated with sleep quality. Higher screen time correlates with worse sleep. Individuals using digital devices more than 4 hours/day had significantly poorer sleep quality than all other groups. PSQI increases with screen time (p<0.05). This suggests -

less than 1 hour/day: lowest PSQI scores (best sleep quality), more than 4 hours/day: highest PSQI scores (poorest sleep quality), and intermediate groups (1–3 hours): moderate PSQI scores.

Limiting screen time to less than 1 hour/day is associated with better sleep quality.

A significant difference in sleep quality (PSQI) across workplace performance rating categories was observed. The pairwise comparisons reveal that the most significant difference is between the "excellent" and "average" categories, where individuals rating their performance as "excellent" experience significantly better sleep quality than those rating it as "average" ($p<0.05$) (Figure 8).

There was no statistically significant difference in sleep quality between participants from urban and rural native places ($p=0.654$).

Sleep hygiene practices

Among the 384 participants, 21.6% reported going to bed before 10 p.m. on weekdays, 37.7% between 10 and 11 p.m., 17.7% between 11 p.m. and 12 a.m., and 23% after midnight. On weekends, 35.4% went to bed after 12 a.m., 25% between 11 p.m. and 12 a.m., and 21.8% before 10 p.m.

73.9% of participants reported waking before 6 a.m. on weekdays, 19% between 6 and 7 a.m., 1.3% between 7 and 8 a.m., and 5.7% after 8 a.m.; on weekends, 30.9% woke before 6 a.m., 13.2% between 6 and 7 a.m., 38% between 7 and 8 a.m., and 17.7% after 8 a.m.

64.8% of the participants reported to never snore, while 5.2% snored daily, 14.8% once a week, and 15.1% once a month. Among those who snored (n=135), 88.1% (n=119) reported not snoring very loudly, whereas 11.8% (n=16) reported loud snoring.

Daytime sleepiness

Of the 384 participants, 49.5% had poor sleep quality (PSQI ≥5), and 29.4% reported excessive daytime sleepiness (ESS ≥10). Sleep hygiene behaviors were notably prevalent, with 65.1% of adults reporting reading in bed, 54.7% watching television in bed, and 46.9% eating in bed. These behaviors were associated with increased daytime sleepiness.

ESS was used to assess the likelihood of daytime dozing in various daily situations. The highest proportion of participants reported a high to very high chance of sleepiness (ESS scores ≥2) while lying down in the afternoon (62.5%), followed by sitting and reading (52.6%) and watching television (48.4%). In contrast, lower proportions were observed for being a passenger in a car for one hour (23.2%) and talking to someone (10.5%). These findings highlight the significant burden of daytime somnolence during passive or low-stimulation activities, suggesting inadequate night time sleep or poor sleep hygiene among adults.

DISCUSSION

This study demonstrated a considerable burden of poor sleep quality and excessive daytime sleepiness among adults residing in urban community settings of Northern India. The prevalence of sleep disturbances observed aligns with the existing international literature, underscoring the growing public health relevance of sleep health in adult populations. Behavioral factors such as screen use, caffeine intake, late-night routines, and poor sleep hygiene practices were significantly associated with adverse sleep outcomes, particularly higher ESS scores and prolonged sleep latency.

Our findings mirror those of a cross-sectional study conducted in Singapore, which reported that poor sleep quality and short sleep duration were common among working adults. The authors emphasized the role of workplace policies in promoting sleep hygiene through structured education and intervention.[19]

Similarly, a report from the National Sleep Foundation's Sleep Health and Aging Conference highlighted that healthy daytime behaviors, including regular light exposure, physical activity, and consistent mealtimes, can positively influence nighttime sleep, especially in older adults. Prioritizing consistent bed and rise times and ensuring 7–8 hours of sleep per night were among the key recommendations.[20,21]

The current study further reinforces the literature linking lifestyle and environmental factors with poor sleep. In a population-based cohort, individuals with poor sleep quality had a 1.38-fold increased risk of mortality compared to good sleepers (95% CI: 1.02–1.85), highlighting the serious long-term health consequences of untreated sleep disturbance. Household environmental factors, including noise, lighting, and inconsistent sleep schedules, have also been shown to contribute to poor sleep quality and shorter sleep duration.[22]

Poor sleep compromises not only personal health but also workplace satisfaction, job readiness, and unit performance. Given the modifiable nature of most associated risk factors, strategic interventions focusing on behavioral changes, environmental modifications, and routine screening can improve sleep outcomes.

Sleep difficulties are significantly associated with medical and psychiatric comorbidities, including cardiac and pulmonary diseases, depression, and the presence of multiple medical conditions, which are detrimental to sleep quality.[23]

In a study on circadian rhythms and meal timing, the authors emphasised role of meal timing and sleep.

Emerging evidence suggests that the timing of meals significantly influences sleep quality and overall metabolic health. Late-night eating can disrupt circadian rhythms, impair sleep onset, and alter hormonal regulation. Conversely, aligning meal times with the body's natural circadian clock may enhance sleep efficiency, reduce the risk of cardiometabolic disorders, and support weight management. These findings underscore the need to consider both sleep hygiene and dietary timing as integral components of adult wellness and lifestyle interventions.[24]

Specific bedtime habits, such as watching TV, writing, or eating in bed, were significantly associated with increased daytime sleepiness in our study. These behaviors disrupt sleep by promoting mental or physiological arousal, delaying sleep onset, and interfering with the sleep architecture. Exposure to blue light from screens suppresses melatonin secretion, whereas cognitive stimulation from writing or planning can increase alertness. Similarly, eating late or in bed may cause gastrointestinal discomfort and alter circadian rhythms, leading to sleepiness and morning fatigue.

Limitations

The use of a cross-sectional design prevented the establishment of causal links between variables. Self-reported data are susceptible to recall bias. Furthermore, the absence of objective sleep assessments, such as actigraphy or polysomnography, implies that sleep patterns were not independently verified. Specific environmental factors within the urban community (e.g., noise levels, work schedules, and shared accommodations) that might influence sleep were not quantitatively captured. Participants with a self-reported history of sleep disorders were excluded without clinical evaluation. This may have resulted in the under-reporting of underlying conditions, such as obstructive sleep apnoea.

CONCLUSION

This study highlights the significant prevalence of poor sleep quality and excessive daytime sleepiness among adults in an urban community. Factors such as irregular sleep-wake schedules, screen use before bedtime, and high workloads adversely affect sleep health. The findings emphasize the urgent need to integrate structured sleep health education and behavioral interventions. Promoting healthy sleep practices is imperative to ensure the combat readiness, cognitive performance, and long-term well-being of personnel.

More than half of the participants reported inadequate sleep quality, while nearly one-third experienced abnormal levels of daytime sleepiness. Cohabitation with spouse is a crucial factor that affects sleep quality. Furthermore, sleep hygiene patterns, specifically the act of eating in bed or shortly before going to sleep, have been identified as significant factors that can be modified to improve sleep quality. Daytime sleepiness was correlated with many characteristics, such as engaging in substantial Internet usage, and activities such as watching television, writing, and eating while in bed also played a role in increased daytime sleepiness.

Recommendations

Sleep health awareness programs

Implementation of regular sensitization sessions and structured workshops on sleep hygiene and the importance of adequate sleep for adults.

Incorporate sleep screening in routine health check-ups

Incorporate validated tools such as the PSQI and ESS in annual medical examinations to identify and manage sleep disturbances early in the workplace.

Behavioral interventions

Encouraging practices such as fixed sleep schedules, limiting screen time before bed, reducing caffeine intake, and relaxation techniques (e.g., guided meditation).

Workplace modifications

Optimizing shift rotations and duty schedules to allow adequate rest periods and minimize circadian disruption.

Mental health support

Integrating sleep counselling within broader stress and mental health services for personnel.

Research and surveillance

Conducting longitudinal studies to monitor trends in sleep health and evaluate the effectiveness of interventions across various urban settings.

Further, use of accessibility modes in smartphones, such as do not disturb (DND) mode, to promote digital interruptions. Scheduled notification restrictions, sleep tracking applications using sensors and sleep focus modes can be used can be used in smartphones. Sleep-friendly sleep space, a place that is quiet, cool, and has optimum lighting to promote a healthful sleep environment. Lifestyle education for adults emphasizes the continuity of good sleep habits from adolescence to adulthood.

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

REFERENCES

1. Nelson KL, Davis JE, Corbett CF. Sleep quality: An evolutionary concept analysis. Nurs Forum (Auckl). 2022;57(1):14451.

2. Sreepada SSS, Halder P, Amudhamozhi KS, Soni V, Sharma H, Rathor S. Prevalence of sleep disorders and association with various occupations among Indian population aged ≥45 years: Insight from Longitudinal Ageing Study in India (LASI). J Family Med Prim Care. 2024;13(10):4208-16.
3. Priya A, Tharion E. Sleep and Exercise among Young Doctors in a Tertiary Care Hospital in India: A Pilot Cross-Sectional Study. J Lifestyle Med. 2022;12(3):164-70.
4. Grover S, Chakraborty K, Basu D. Pattern of internet use among professionals in India: Critical look at a surprising survey result. Ind Psychiatry J. 2010;19:94-100.
5. Singh L, Suchandra KH, Pattajoshi A, Mamidipalli SS, Kamal H, Singh S, et al. Internet addiction and daytime sleepiness among professionals in India: A web-based survey. Vol. 61, Indian Journal of Psychiatry. Wolters Kluwer Medknow Publications. 2019;265-9.
6. Del Brutto OH, Mera RM, Rumbea DA, Sedler MJ, Castillo PR. Poor sleep quality increases mortality risk: A population-based longitudinal prospective study in community-dwelling middle-aged and older adults. Sleep Health. 2024;10(1):144-8.
7. Ford DE, Cooper-Patrick L. Sleep disturbances and mood disorders: An epidemiologic perspective. Depress Anxiety. 2001;14(1):3-6.
8. Gupta S, Prithviraj M, Gangwar A, Rath RS. Impact of Sleep Duration, Quality, and Chronotype on Learning and Academic Performance: A Cross-Sectional Study Among First Year Medical Students of a Tertiary Care Institute. Cureus. 2023;13.
9. Singh L, Suchandra KH, Pattajoshi A, Mamidipalli SS, Kamal H, Singh S, et al. Internet addiction and daytime sleepiness among professionals in India: A web-based survey. Vol. 61, Indian Journal of Psychiatry. Wolters Kluwer Medknow Publications. 2019;265-9.
10. Booker LA, Barnes M, Alvaro P, Collins A, Chai-Coetzer CL, McMahon M, et al. The role of sleep hygiene in the risk of Shift Work Disorder in nurses. Sleep. 2019;22.
11. Irish LA, Kline CE, Gunn HE, Buysse DJ, Hall MH. The role of sleep hygiene in promoting public health: A review of empirical evidence. Sleep Med Rev. 2015;22:23-36.
12. Alanazi EM, Alanazi AMM, Albuhairy AH, Alanazi AAA. Sleep Hygiene Practices and Its Impact on Mental Health and Functional Performance Among Adults in Tabuk City: A Cross-Sectional Study. Cureus. 2023;16.
13. Nasim M, Saade M, AlBuhairan F. Sleep deprivation: prevalence and associated factors among adolescents in Saudi Arabia. Sleep Med. 2019;53:165-71.
14. Knutson KL. Sleep duration and cardiometabolic risk: A review of the epidemiologic evidence. Best Pract Res Clin Endocrinol Metab. 2010;24(5):731-43.
15. Medic G, Wille M, Hemels M. Short- and long-term health consequences of sleep disruption. Nat Sci Sleep. 2017;9:151-61.
16. The Epworth Sleepiness Scale. About the ESS. Available at: https://epworthsleepinessscale.com/about-the-ess/. Accessed on 12 May 2025.
17. University of Pittsburgh. The Pittsburgh Sleep Quality Index (PSQI). Available at: https://www.sleep.pitt.edu/psqi. Accessed on 12 May 2025.
18. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. Psychiatry Res. 1989;28(2):193-213.
19. Visvalingam N, Sathish T, Soljak M, Chua AP, Dunleavy G, Divakar U, et al. Prevalence of and factors associated with poor sleep quality and short sleep in a working population in Singapore. Sleep Health. 2020;6(3):277-87.
20. Koffel E, Ancoli-Israel S, Zee P, Dzierzewski JM. Sleep health and aging: Recommendations for promoting healthy sleep among older adults: A National Sleep Foundation report. Sleep Health. 2023;9(6):821-4.
21. Nelson KL, Davis JE, Corbett CF. Sleep quality: an evolutionary concept analysis. Nurs Forum. 2022;57:144-51.
22. Chapagai S, Vu TH, Alexandria SJ, Reid KJ, Abbott S, Harrington K, et al. Association between household sleep environment and sleep health characteristics in middle-aged adults: The CARDIA sleep study. Sleep Health. 2025;S2352.
23. Ancoli-Israel S. Sleep and its disorders in aging populations. Sleep Med. 2009;10:S7-11.
24. Boege HL, Bhatti MZ, St-Onge MP. Circadian rhythms and meal timing: impact on energy balance and body weight. Curr Opin Biotechnol. 2021;70:1-6.

Cite this article as: Sharma S, Chatterjee K, Rath TK, Mahajan S, Samanta I, Misra A, et al. Assessment of sleep quality, daytime sleepiness, and sleep hygiene practices among adults in a metropolitan city: a cross-sectional study. Int J Community Med Public Health 2025;12:3724-32.