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Gender disparities in sleep quality: insights from high school and college students in Thiruvalla Taluk, Kerala

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Abstract

Sleep quality is an important yet most neglected aspect of an individual. This study examined gender differences in sleep quality among students from five academic streams namely High School, Arts and Science, Engineering, Pharmacy, and Nursing using Pittsburgh Sleep Quality Index (PSQI). The results revealed that females had poorer sleep quality compared to males in High school, Engineering, and Pharmacy streams, whereas in Arts & Science and Nursing streams, males showed slightly worse sleep quality than females, although the difference was negligible. Despite assessing academic, lifestyle, and environmental factors, no clear gender-based trends were found. However, females reported higher academic stress, in terms of exam fear and late-night studying.

This article is likely the first to explore gender-based differences in sleep quality across five different streams in the Pathanamthitta district of Kerala.

Keywords: PSQI; Female; Male; Thiruvalla; Sleep Quality; High School; Arts &Science; Engineering; Pharmacy; Nursing

1. Introduction

Sleep is a natural state of rest that is essential for restoring physical and mental functions and it plays a crucial role in student's academic performance and well-being.[1] However, many students fail to get the recommended 8-10 hours of sleep due to early school start times and academic workload. This lack of sleep can impact their attention, memory consolidation, and decision-making skills, leading to poorer grades and increased risk of mental health issues like depression and anxiety. [2,3]

Gender differences can also affect sleep quality.[4] Female students often report longer sleep onset times, more frequent nighttime awakenings, and poorer overall sleep quality compared to male students. [5,6] Additionally, students pursuing academically demanding courses often compromise on sleep to get their academic work done and such a trend is commonly observed in females.[7] However, these differences can vary based on individual academic competitiveness. In Kerala, with a higher literacy rate than other Indian states, students face greater pressure from their families and society to excel academically, which may negatively affect their sleep.[8]

Various other factors like late-night use of devices, environmental disturbances like noise and light, caffeine use, messy rooms are also responsible for poor sleep quality. [9,10]

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This study, aims to assess the gender differences in sleep quality and identify factors influencing it among high school and college students in various streams in Thiruvalla, using the PSQI scale. By identifying these disparities, the study seeks to contribute valuable insights that could develop strategies to enhance the sleep quality and well-being of both male and female students across diverse academic environments.

Objective

The objective of this study was to identify the gender differences in sleep quality among students studying in high school and various courses like Arts& Science, Engineering, Pharmacy, and Nursing in Thiruvalla taluk, Pathanamthitta district Kerala.

2. Materials and methodology

A community-based prospective interventional study was conducted to assess the gender-based differences in sleep quality and patterns among youth among 750 students (150 each from High school, Arts& Science, Engineering, Pharmacy, and Nursing colleges) in Thiruvalla, Kerala. The study, approved by the Institutional Review Board of Nazareth College of Pharmacy was conducted between November 2023 to April 2024. Participants were students aged 15-24, excluding shift workers, unwilling participants, those with incomplete responses, and pregnant or lactating females. After obtaining consent, students completed a questionnaire which included the Pittsburgh Sleep Quality Index (PSQI). [The PSQI is a self-administered questionnaire consisting of 19 items across seven components: sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. Each component is scored from 0-3, with the total Global PSQI score ranging from 0-21. A score below 5 indicates good sleep, and a score above 5 indicates poor sleep]. Data were analyzed using Microsoft Excel-2019.

3. Results

3.1. Distribution of Age Group of Subjects

Among the 750 students enrolled in the study in the age group range of 15-24, most were aged 19-20 years (34.4%) followed by 21-22 years (21.87%), 17-18 years (21.6%), 15-16 years (14.93%) and 23-24 years (7.2%).

3.2. Distribution of Gender of Subjects Among Different Courses
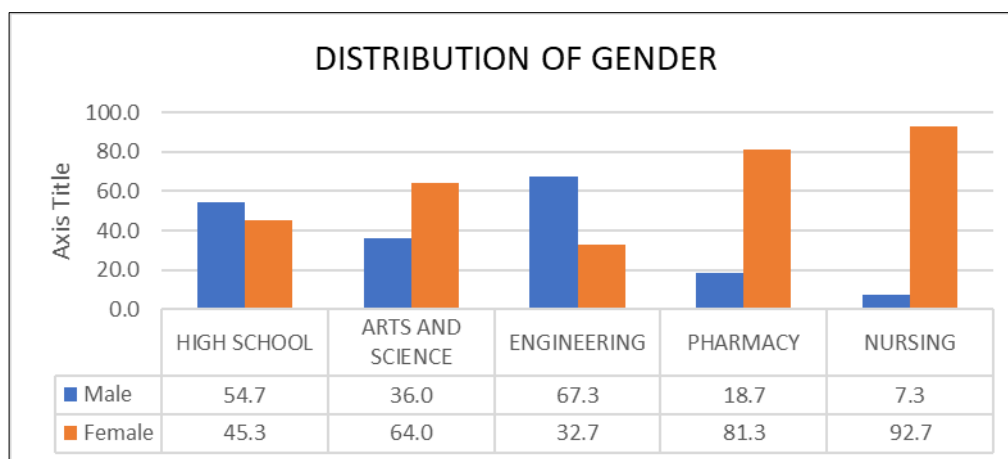

Figure 1 Distribution of subjects based on gender among different courses

Of the 750 participants, 276 (36.8%) were male and 474 (63.2%) were female. Gender distribution across streams were as follows: High School- 82 males (54.7%) and 68 females (45.3%); Arts & Science- 54 males (36%) and 96 females (64%), Engineering- 101 males (67.3%) and 49 females (32.7%), Pharmacy- 28 males (18.7%) and 122 females (81.3%) and Nursing -11 males (7.3%) and 139 females (92.6%).

3.3. Distribution of Gender-Based Differences in PSQI Components among Different Courses

Table 1 Distribution of Gender-Based Differences in PSQI Components among different courses

S NO	PSQI	COURSE	S1 N (%)		S2 N (%)		S3 N (%)		S4 N (%)		S5 N (%)	
		SEX	M 82 (54.7)	F 68 (45.3)	M 54 (36)	F 96 (64)	M 101 (67.3)	F 49 (32.7)	M 28 (18.7)	F 122 (81.3)	M 11 (7.3)	F 139 (92.7)
1	SUBJECTIVE SLEEP QUALITY											
		Very good/ Fairly good	52 (63.4)	38 (55.9)	30 (55.6)	54 (56.3)	63 (62.4)	25 (51.0)	18 (64.3)	76 (62.3)	7 (63.6)	91 (65.5)
		Fairly bad/very bad	30 (36.6)	30 (44.1)	24 (44.4)	42 (43.8)	38 (37.6)	24 (49.0)	10 (35.7)	46 (37.7)	4 (36.4)	48 (34.5)
2	SLEEP LATENCY											
		Very good/fairly good	68 (82.9)	43 (63.2)	35 (64.8)	74 (77.1)	72 (71.3)	40 (81.6)	24 (85.7)	86 (70.5)	10 (90.9)	124 (89.2)
		Fairly bad/very bad	14 (17.1)	25 (36.8)	19 (35.2)	22 (22.9)	29 (28.7)	9 (18.4)	4 (14.3)	36 (29.5)	1 (9.1)	15 (10.8)
3	SLEEP DURATION											
		>7 hrs/night	11 (13.4)	4 (5.9)	6 (11.1)	18 (18.8)	8 (7.9)	0 (0.0)	2 (7.1)	12 (9.8)	0 (0.0)	2 (1.4)
		≤ 7hrs/night	71 (86.6)	64 (94.1)	48 (88.9)	78 (81.3)	93 (92.1)	49 (100)	26 (92.9)	110 (90.2)	11 (100)	137 (98.6)
4	HABITUAL SLEEP EFFICIENCY											
		> 85%	78 (95.1)	63 (92.6)	49 (90.7)	96 (100.0)	92 (91.1)	48 (98.0)	26 (92.9)	114 (93.4)	11 (100)	136 (97.8)
		≤ 85%	4 (4.9)	5 (7.4)	5 (9.3)	0 (0.0)	9 (8.9)	1 (2.0)	2 (7.1)	8 (6.6)	0 (0.0)	3 (2.2)
5	SLEEP DISTURBANCES											
		SCORE 0-1	71 (86.6)	50 (73.5)	45 (83.4)	69 (71.9)	73 (72.3)	11 (85.8)	25 (89.3)	100 (81.9)	11 (100)	139 (100)
		SCORE 2-3	11 (13.4)	18 (26.5)	9 (16.7)	27 (28.1)	28 (27.7)	7 (14.3)	3 (10.7)	22 (18)	0 (0.0)	0 (0.0)
6	USE OF SLEEP MEDICATIONS											
		Not during the past month /	79 (93.9)	67 (97.1)	51 (92.6)	94 (94.8)	96 (95.0)	48 (95.9)	27 (96.4)	.4)	10 (90.9)	139 (99.3)

	Less than once a week									
	Three Or More Times A Week	3 (3.7)	1 (1.5)	1 (1.9)	1 (1.0)	0 (0.0)	0 (0.0)	1 (3.6)	0 (0.0)	0 (0.0)	0 (0.0)
7	DAYTIME DYSFUNCTION									
	Score 0-1	56 (68.2	31 (45.5)	37 (66)	70 (72.9)	76 (75.2)	30 (61.2)	20 (71.4)	97 (79.5)	11 (100)	114 (82)
	Score 2-3	26 (24.3)	37 (54.4)	17 (31.4)	26 (27)	25 (24.7)	19 (38.7)	8 (28.57)	25 (20.4)	0 (0)	25 (18.38)

S1=HIGH SCHOOL, **S2**=ARTS& SCIENCE, **S3**=ENGINEERING, **S4**= PHARMACY **S5**=NURSING, **M**=MALE, **F**=FEMALE

3.4. Distribution of Gender-Based Differences in Global PSQI Scores among Different Courses
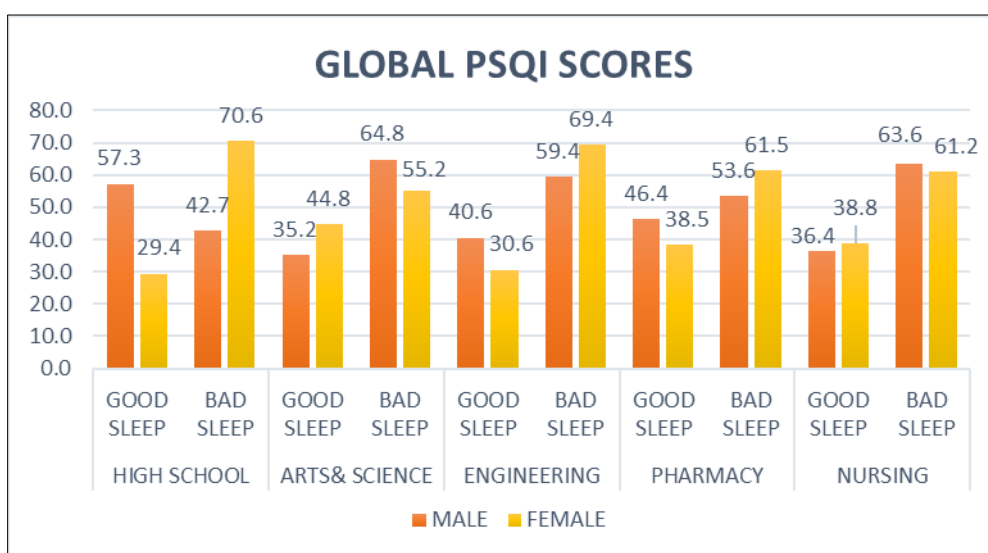

Figure 2 Distribution of Gender-Based Differences in PSQI scores among Different Courses

Out of the 750 students, in high school, 48 females(70.6%) had poor sleep compared to 35 males (42.7%); in arts& science, 53 females (55.2%) and 35 males (64.8%) had poor sleep; in engineering, 34 females (69.4%) and 60 males (59.4%); in pharmacy students, 75 females (61.5%) and 15 males (53.6%) had poor sleep and in nursing students, 85 (61.2%) females and 7 (63.6%) males had poor sleep. Three out of the five streams (High school, engineering, pharmacy) had females who reported poorer sleep compared to males.

3.5. Distribution of Gender-Based Differences in Factors Affecting Sleep among Different Courses

Table 2 Distribution of Gender-Based Differences in Factors affecting sleep among Different Courses

Sl. No.	FACTORS AFFECTING SLEEP	S1 N (%)		S2 N (%)		S3 N (%)		S4 N (%)		S5 N (%)	
		M 82 (54.7)	F 68 (45.3)	M 54 (36)	F 96 (64)	M 101 (67.3)	F 49 (32.7)	M 28 (18.7)	F 122 (81.3)	M 11 (7.3)	F 139 (92.7)
1.	ACADEMIC FACTORS										

a.	Exam Fear	25 (30.5)	37 (54.4)	41 (75.9)	43 (44.8)	30 (29.7)	27 (55.1)	16 (57.1)	70 (57.4)	2 (18.2)	69 (49.6)
b.	Late Night assignment completion and studying	69 (84.1)	62 (91.2)	24 (44.4)	48 (50)	57 (56.4)	32 (65.3)	16 (57.1)	71 (58.2)	9 (81.8)	114 (82)
2.	LIFESTYLE FACTORS										
a.	Caffeine	10 (12.2)	3 (4.4)	7 (13)	7 (7.3)	2 (2)	0 (0)	2 (7.1)	5 (4.1)	0 (0.0)	3 (2.2)
b.	Gadget use	43 (52.4)	33 (48.5)	39 (72.2)	54 (56.3)	54 (53.5)	26 (53.1)	17 (60.7)	67 (54.9)	5 (45.5)	43 (30.9)
3.	ENVIRONMENTAL FACTORS										
a.	Light And Noise	22 (26.8)	16 (23.5)	17 (31.5)	34 (35.4)	25 (24.8)	22 (44.9)	7 (25)	48 (39.3)	3 (27.3)	45 (32.4)
b.	Messy room	28 (34.1)	11 (16.2)	10 (18.5)	35 (36.5)	18 (17.8)	14 (28.6)	6 (21.4)	44 (36.4)	2 (18.2)	43 (30.9)

S1=HIGH SCHOOL, S2=ARTS& SCIENCE, S3=ENGINEERING, S4= PHARMACY S5=NURSING, M=MALE, F=FEMALE

Factors affecting sleep in males and females in all the courses were studied and females reported a higher percentage of academic factors like exam fear, late-night assignment completion, and study compared to males in most streams. Lifestyle factors like caffeine use, gadget use was found to be higher among males. Environmental factors like light and noise, messy rooms, showed mixed trends with females reporting higher disruption in some cases.

4. Discussion

This study aimed to explore how sleep quality differed between males and females aged 15-24, studying in high school, arts& science, engineering, pharmacy, and nursing colleges using the PSQI. The findings revealed that in High school, engineering, and pharmacy, females reported poorer sleep compared to males, whereas in arts & science and nursing streams, males reported poorer sleep than females, although the difference was negligible. These results, align with previous research indicating that females are more prone to poor sleep than males, despite having better objective sleep quality i.e., longer sleep time and shorter wake time. [11] Females also tend to feel more fatigued and are likely to experience insomnia than men, especially in demanding academic courses, as they often sacrifice their sleep for academics. [12]

The study also examined the relationship between academic, lifestyle, and environmental factors with PSQI scores, but no clear association was revealed. PSQI being a self-reported tool may be influenced by individual perceptions, stress levels, and cognitive biases which may vary across students in each course.[13] Females in some streams reported higher rates of exam fear, late-night studying, and assignment completion than males, showing greater academic pressure on females than males due to societal expectations, perfectionist tendencies, and increased emotional response to academic challenges. Lifestyle factors showed mixed results for males and females, wherein males consumed more caffeine before going to sleep and used gadgets later at night than females in most courses.[14] Environmental factors like light &noise, and messy rooms had no clear trend between males and females. [15]

While gender differences in sleep quality are evident, they might not be the same across all the streams. The findings highlight that sleep quality among students is influenced by a variety of factors that go beyond those measured in this

study. They also emphasize the need for considering individual stressors and developing personalized coping strategies to improve sleep quality.

Abbreviations

PSQI: Pittsburgh Sleep Quality Index

5. Conclusion

This study identified significant gender differences in sleep quality across academic streams, with females in High school, engineering, and pharmacy reporting poorer sleep compared to their male counterparts according to PSQI scores. While academic stress, lifestyle habits, and environmental factors were analyzed no clear association was established between these factors and the observed sleep disparities. Females were more susceptible to academic stress than males. The results align with existing research suggesting that females are more prone to sleep disturbances. However, the self-reported nature of the PSQI might result in potential biases that may influence findings.

These results emphasize the need for targeted interventions addressing sleep hygiene awareness and managing academic stress which could be beneficial in improving sleep quality among students.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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