

Prevalence and Patterns of Sleep Disturbances Among Medical Students in Karbala, Iraq

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Abstract :

Background: Sleep disturbances are common among university students and may adversely affect academic performance and daily functioning. This study assessed the prevalence of sleep disturbances among medical students in Karbala, Iraq, and explored associated behavioral and functional factors. Sleep disturbances are increasingly recognized as a major public health issue among university students, particularly medical students. This cross-sectional study assessed prevalence, patterns, and academic consequences of sleep disturbances among medical students in Karbala, Iraq. **Methods:** A cross-sectional study was conducted among 254 medical students from medical colleges in Karbala during the 2022–2023 academic year. Data were collected using a structured sleep questionnaire distributed electronically. Descriptive statistics and chi-square tests were used for analysis. Statistical significance was set at $P < 0.05$.

Results: The mean age of participants was 20.53 years. Females represented 71.8% of the sample. Irregular sleep was reported by 62.7% of students. The most frequent sleep-related complaint was nocturnal awakening (60.6%), followed by excessive daytime sleepiness (29.1%). Approximately 42% required more than 30 minutes to fall asleep. Significant associations were observed between irregular sleep and bedtime habits, wake-up time, stimulant consumption, social media use before sleep, concentration difficulties, memory impairment, and reduced daily functioning.

Conclusions: Sleep disturbances are highly prevalent among medical students in Karbala and are associated with adverse cognitive and functional outcomes. Educational interventions promoting sleep hygiene, physical activity, and healthy technology use are recommended.

Key words:

Karbala, Medical students, sleep disturbances

Introduction

Sleep is a fundamental physiological process essential for neurocognitive achievements, memory consolidation, emotional regulation, metabolic homeostasis, and immune function.^(1,2,3) Medical students are particularly liable to sleep disruption because of academic stress, examinations, long study hours, and extensive electronic device use. International studies from Europe, Asia, Africa, and the Middle East consistently report high rates of poor sleep quality among medical students ^(4,5,6). Sleep deprivation adversely affects attention, executive function, clinical performance, and psychological well-being. Despite increasing awareness, data from Iraq remain limited. Therefore, this study sought to evaluate the prevalence and correlates of sleep disturbances among medical students in Karbala, Iraq, and explore their effects on academic functioning.

Methods

A cross-sectional questionnaire-based study was conducted among medical students from universities in Karbala between September 2022 and June 2023. The survey collected demographic characteristics, sleep habits, lifestyle factors, stimulant use, sports participation, symptoms suggestive of sleep disorders, and perceived academic consequences. Data were analyzed using IBM SPSS version 25. Descriptive statistics were presented as frequencies, percentages, means, and standard deviations. Associations between sleep characteristics and sleep regularity were examined using chi-square testing with statistical significance defined as $p < 0.05$.

Results

Among 254 participants, females represented 71.8% and males 27.8%, . The mean age was 20.53 years (Table 1). Irregular sleep was reported by 62.7% of students. The most common bedtime was between 1:00 and 3:00 AM, More than one-third of participants reported waking up after 9:00 AM . Mean sleep duration was approximately 7.5 hours (Table 2). Half of students report that they browse social media before sleep, another half claimed using stimulant like tea or coffee and nearly another half said that they are night persons (Table 3). Night awakenings occurred in 60.6% of students, commonly related to nightmares or unexplained causes . Daytime sleepiness affected 29.1% of participants. Nearly half reported memory difficulties, while over one-third experienced impaired concentration (Table 4). Approximately 70% reported difficulties performing daily activities (Table 4). Significant associations were identified between sleep regularity and bedtime, wake-up time, stimulant consumption, social media use before sleep, and staying up late (all tables) .

Discussion

The present study demonstrates a high prevalence of sleep disturbances among medical students in Karbala. The prevalence of irregular sleep exceeded 60%, indicating a substantial burden of sleep-related problems within this population. Similar findings have been reported among medical students in Iran, Saudi Arabia, Ghana, and European institutions.^(5,6,7) The high frequency of late bedtimes likely reflects academic workload, examination stress, and increasing exposure to digital media.

The association between social media use and irregular sleep observed in this study is biologically plausible. Exposure to blue light emitted by electronic devices suppresses melatonin secretion and delays circadian rhythms. Furthermore, psychological engagement with social media may increase cognitive arousal and prolong sleep latency.^(8,9)

The observed prevalence of daytime sleepiness is clinically relevant because excessive daytime sleepiness has been associated with reduced academic productivity, impaired learning, and increased risk of accidents. The finding that almost half of participants reported memory difficulties further supports the negative cognitive consequences of inadequate sleep.

Physical inactivity was common among participants. Regular exercise has been shown to improve sleep quality through modulation of circadian rhythms and reduction of stress levels. Therefore, promotion of physical activity may represent a practical intervention to improve sleep health among university students.^(10,11,12)

The relationship between sleep disturbance and academic functioning deserves particular attention. Students reporting poor sleep were more likely to experience concentration deficits, memory impairment, and reduced performance of daily activities. These findings are consistent with contemporary evidence indicating that sleep quality is a critical determinant of academic achievement and cognitive efficiency.⁽⁸⁾

Compared with previous regional studies, the prevalence of nocturnal awakenings and irregular sleep patterns in the present study appears relatively high. This observation may reflect unique academic pressures, cultural factors, lifestyle behaviors, or environmental influences affecting Iraqi medical students.^(5,6,7)

Future studies should incorporate validated instruments such as the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and Insomnia Severity Index (ISI). Prospective designs and objective sleep measurements would further strengthen understanding of sleep disturbances in this population.

Strengths and Limitations

The strengths of this study include inclusion of students from multiple academic years and comprehensive assessment of sleep-related behaviors. Limitations include the cross-sectional design, reliance on self-reported data, potential recall bias, and absence of objective sleep measurements. Additionally, causal relationships cannot be established.

Conclusions

Sleep disturbances are highly prevalent among medical students in Karbala and are associated with impaired concentration, memory difficulties, daytime sleepiness, and reduced daily functioning. Universities should prioritize sleep-health promotion, mental health support, and educational interventions addressing sleep hygiene and healthy lifestyle behaviors.

Recommendations

1. Implement sleep-health awareness programs within medical colleges.
2. Encourage regular physical activity.
3. Promote responsible use of electronic devices before bedtime.
4. Provide counseling services for students experiencing sleep difficulties.
5. Conduct multicenter studies using validated sleep assessment tools.
6. Explore predictors of sleep disturbances using multivariable regression models.

Tables

Table (1) Demographic characteristic of medical students they participate in the research.

Variables	Group	No:	%
Gender	Female	183	71.8%
	Male	71	27.8%
Age groups (Years)	18	38	14.9%
	19	48	18.8%
	20	53	20.8%
	21	37	14.5%
	22	40	15.7%
	23	23	9.0%
	24	11	4.3%
	25	2	0.8%
Study stage	First stage	47	18.4%
	Second stage	60	23.5%
	Third stage	53	20.8%
	Fourth stage	25	9.8%
	Fifth stage	49	19.2%
	Sixth stage	20	7.8%
which university you from	Karbala	197	77.3%
	Babylon	2	0.8%
	Warith Al-Anbiyaa	53	20.8%
	Jabir Ibn Hayyan	1	0.4%
	Al-Aamed	1	0.4%

Table (2) the distribution of sleep cycle among medical students.

Variables	Group	How is your sleep?		Total	P value
		Regular	Irregular	N (%)	
The time you usually go to sleep?	9-11 PM	25 (26.6%)	10 (6.3%)	35 (13.8%)	0.006 [S]
	11-1 AM	48 (51.5%)	34 (21.3%)	82 (32.3%)	
	1-3 AM	17 (18.1%)	68 (42.5%)	85 (33.5%)	
	3-5 AM	2 (2.1%)	35 (21.9%)	37 (14.6%)	
	other	2 (2.1%)	13 (8.1%)	15 (5.9%)	
Usual time to Wake up in the morning?	4 AM	2 (2.1%)	2 (2.1%)	4 (1.6%)	0.042 [S]
	5 AM	4 (4.3%)	10 (6.3%)	14 (5.5%)	
	6 AM	27 (28.7%)	23 (14.4%)	50 (19.7%)	
	7 AM	19 (20.2%)	29 (18.1%)	48 (18.9%)	
	8 AM	12 (12.8%)	11 (6.9%)	23 (9.1%)	
	9 AM	13 (13.8%)	9 (5.6%)	22 (8.7%)	
	More than 9 AM	17 (18.1%)	76 (47.5%)	93 (36.6%)	

Number of hours	1	0	1	1	
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of sleep (hours)			(0.6%)	(0.4%)	0.02 [S]
	3	0	2 (1.3%)	2 (0.8%)	
	4	1 (1.1%)	9 (5.7%)	10 (4.0%)	
	5	5 (5.4%)	17 (10.8%)	22 (8.8%)	
	6	21 (22.6%)	30 (19.1%)	51 (20.4%)	
	7	18 (19.4%)	27 (17.2%)	45 (18.0%)	
	8	32 (34.4%)	20 (12.7%)	52 (20.8%)	
	9	7 (7.5%)	17 (10.8%)	24 (9.6%)	
	10	7 (7.5%)	21 (13.4%)	28 (11.2%)	
	11	0	4 (1.6%)	4 (1.6%)	
	12	2 (2.2%)	9 (5.7%)	11 (4.4%)	
How long does it take you to go to bed before you fall asleep?	Less than 15min	39 (41.5%)	38 (23.8%)	77 (30.3%)	0.802
	15-30min	37 (39.4%)	51 (31.9%)	88 (34.6%)	
	45min-1h	13 (13.8%)	30 (18.8%)	43 (16.9%)	
	Another	5 (5.3%)	41 (25.6%)	46 (18.1%)	
Do you have dreams while sleeping?	Yes	66 (70.2%)	127 (79.4%)	193 (76.0%)	0.09
	No	28 (29.8%)	33 (20.6%)	61 (24.0%)	

* Chi-Square was: significant at $P \leq 0.05$

Table (3) Demographic effect of behavior & risk factors on sleep.

Variables	Group	How is your sleep?		Total	P value
		Regular	Irregular	N (%)	
Do you take sleeping pills?	Yes	1 (1.1%)	12 (7.5%)	13 (5.1%)	0.4
	No	93 (98.9%)	148 (92.5%)	241 (94.4%)	
Do you practice sports	Yes	42 (44.7%)	50 (31.3%)	92 (36.2%)	0.07
	No	52 (55.3%)	110 (68.7%)	162 (63.4%)	
If your answer is yes, how many times a week?	Once a week	11 (25.0%)	15 (26.8%)	26 (26.0%)	0.72
	2-3 times a week	18 (40.9%)	27 (48.2%)	45 (45.0%)	
	Everyday	10 (22.7%)	8 (14.3%)	18 (18.0%)	
	Another	5 (11.4%)	6 (10.7%)	11 (11.0%)	
Before you sleep, what activities do you do?	Watching TV	8 (8.5%)	9 (5.6%)	17 (6.7%)	0.04 [S]
	Browse social media	57 (60.6%)	105 (65.6%)	162 (63.8%)	
	Books reading	9 (9.6%)	14 (8.8%)	23 (9.1%)	
	Texts	14 (14.9%)	22 (13.8%)	36 (14.2%)	
	Video Games	2 (2.1%)	7 (4.4%)	9 (3.5%)	
	Another	4 (4.3%)	3 (1.9%)	7 (2.8%)	

	During normal University days	7 (7.4%)	14 (8.8%)	21 (8.3%)	
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When did you become a habit of staying up late?	Exams time only	27 (28.7%)	26 (16.3%)	53 (20.9%)	0.006 [S]
	Both	19 (20.2%)	99 (61.9%)	118 (46.5%)	
	I don't suffer from Staying up late	41 (43.6%)	21 (13.1%)	62 (24.4%)	
Do you take any stimulants?	Tea	40 (42.6%)	61 (38.1%)	101 (39.8%)	0.03 [S]
	Coffee	23 (24.5%)	34 (21.3%)	57 (22.4%)	
	Energy drinks	2 (2.1%)	5 (3.1%)	7 (2.8%)	
	Don't take	29 (30.9%)	60 (37.5%)	89 (35.0%)	
If your answer is one of the stimulants, how many cups do you drink per day?	1	26 (41.9%)	33 (33.3%)	59 (36.6%)	0.01 [S]
	2	13 (21.0%)	33 (33.3%)	46 (28.6%)	
	3	16 (25.8%)	18 (18.2%)	34 (21.1%)	
	4	4 (6.5%)	12 (12.1%)	16 (9.9%)	
	5	2 (3.2%)	3 (3.0%)	5 (3.1%)	
	6	1 (1.6%)	0	1 (0.6%)	

Are you smoker?	I Don't smoke	88 (93.6%)	153 (95.6%)	241 (94.9%)	0.38
	Rarely	4 (4.3%)	4 (2.5%)	8 (3.1%)	
	1-10per day	1 (1.1%)	1 (0.6%)	2 (0.8%)	
	11-20 per day	1 (1.1%)	1 (0.6%)	2 (0.8%)	
	More than 20 per day	0	1 (0.4%)	1 (0.4%)	
Are you a day or night person?	Day	61 (64.9%)	63 (39.4%)	124 (48.8%)	0.06
	Night	33 (35.1%)	97 (60.6%)	130 (51.2%)	

*** Chi-Square was: significant at $P \leq 0.05$**

The result showed that most of Participants (59.6%) wake up suddenly at night most of them due to nightmares or they don't know the reason on the average mean (9.77)

Table (4) the medical or psychological condition related to disturbance.

Variables	Group	How is your sleep?		Total	P value
		Regular	Irregular	N (%)	
Do you experience a lack of concentration during the day?	Yes	20 (21.3%)	78 (48.8%)	98 (38.6%)	0.03 [S]
	No	38 (40.4%)	25 (15.6%)	63 (24.8%)	
	Maybe	36 (38.3%)	57 (35.6%)	93 (36.6%)	
Do you have a problem with forgetting or difficulty memorizing?	Yes	32 (34.0%)	93 (58.1%)	125 (49.2%)	0.007 [S]
	No	27 (28.7%)	21 (13.1%)	48 (18.9%)	
	Maybe	35 (37.2%)	46 (28.8%)	81 (31.9%)	
Do you have difficulty performing daily activities?	Yes	45 (47.9%)	132 (82.5%)	177 (69.7%)	0.008 [S]
	No	49 (52.1%)	28 (17.5%)	77 (30.3%)	
Was your sleep normal before the university?	Yes	65 (69.1%)	79 (49.4%)	144 (56.7%)	0.5
	No	28 (29.8%)	81 (50.6%)	109 (42.9%)	
How many nights do you stay up during the week?	1	10 (19.2%)	3 (2.4%)	13 (7.3%)	0.06
	2	12 (23.1%)	9 (7.1%)	21 (11.8%)	
	3	10 (19.2%)	15 (11.9%)	25 (14.0%)	

	4	0	22 (17.5%)	22 (12.4%)	
	5	6 (11.5%)	19 (15.1%)	25 (14.0%)	
	6	4 (7.7%)	11 (8.7%)	15 (8.4%)	
	7	10 (19.2%)	47 (37.3%)	57 (32.0%)	
If you have trouble sleeping, how long have you been?	I Don't have trouble sleeping	68 (73.1%)	39 (24.4%)	107 (42.3%)	0.14
	Less than month	7 (7.5%)	11 (6.9%)	18 (7.1%)	
	1-2 months	7 (7.5%)	25 (15.6%)	32 (12.6%)	
	3-6 months	2 (2.2%)	14 (8.8%)	16 (6.3%)	
	7-12 months	3 (3.2%)	15 (9.4%)	18 (7.1%)	
	1-2 years	1 (1.1%)	44 (27.5%)	45 (17.8%)	
	another	5 (5.4%)	12 (7.5%)	17 (6.7%)	
Do you snore during sleep?	Yes	6 (6.4%)	4 (2.5%)	10 (3.9%)	1.03
	No	72 (76.6%)	130 (81.3%)	202 (79.5%)	
	Maybe	16 (17.6%)	26 (16.3%)	42 (16.5%)	
Do you have breath problem during sleep?	Yes	11 (11.7%)	25 (15.6%)	36 (14.2%)	0.12
	No	83 (88.3%)	134 (83.8%)	217 (85.4%)	
Do you walk or talk with sleep?	Yes	8 (8.5%)	18 (11.3%)	26 (10.2%)	0.6
	No	86 (91.5%)	142 (88.8%)	228 (89.9%)	

Do you suffer from uncontrolled leg movement during sleep?	Yes	14 (14.9%)	30 (18.8%)	44 (17.3)	0.4
	No	80 (85.1%)	130 (81.3%)	210 (82.7%)	
Do you suffer from uncontrolled sleep during the day?	Yes	17 (18.1%)	57 (35.6%)	74 (29.1%)	0.64
	No	77 (81.9%)	103 (64.4%)	180 (70.9)	
Have you ever woken up suddenly in the midnight?	Yes	43 (45.7%)	111 (69.4%)	154 (60.6%)	0.06
	No	51 (54.3%)	49 (30.6%)	100 (39.4%)	
If your answer was yes for what reason?	Nightmares	8 (8.5%)	18 (11.3%)	26 (10.2%)	0.04 [S]
	Thirsty	4 (4.3%)	5 (3.1%)	9 (3.5%)	
	Go the bathroom	1 (1.1%)	5 (3.1%)	6 (2.4%)	
	Anxiety	2 (2.1%)	6 (3.8%)	8 (3.1%)	
	Overthinking	0	4 (2.5%)	4 (1.6%)	
	Disease	0	1 (0.6%)	1 (0.4%)	
	Insomnia	0	۲ (٪۱,۳)	۲ (٪۰,۸)	
	Dream	۴ (٪۴,۳)	۱۹ (٪۱۱,۹)	۲۳ (٪۹,۱)	
	Study	0	۱ (٪۰,۶)	۱ (٪۰,۴)	
	Palpitation	0	۱ (٪۰,۶)	۱ (٪۰,۴)	
	Breath problem	۲ (٪۲,۱)	۲ (٪۱,۳)	۴ (٪۱,۶)	
	I don't wake up	۵۰ (٪۵۳,۲)	۴۷ (٪۲۹,۴)	۹۷ (٪۳۸,۳)	
	No reason	۲۳ (٪۲۴,۵)	۴۹ (٪۳۰,۶)	۷۲ (٪۲۸,۳)	

Do you have another family members has sleep problem?	Yes	۲۷ (28.7%)	67 (41.9%)	۹۴ (37.0%)	0.9
	No	67 (71.3%)	۹۳ (58.1%)	160 (63.0%)	

*** Chi-Square was: significant at $P \leq 0.05$**

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