

# Sleep Quality among Medical Students and its Relationship with Self-reported Skin Complaints: A Cross-sectional Study

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## ABSTRACT

**Introduction:** Sleep disturbances are a widespread issue among medical students and have been linked to various negative outcomes, both academically and personally. Sleep plays a crucial role in regulating various aspects of skin physiology, including surface pH, trans-epidermal water loss, blood flow, and skin temperature.

**Aim:** This study aimed to assess the sleep quality and the relationship with skin symptoms among medical students at the College of Medicine, Northern Border University, Arar City, Kingdom of Saudi Arabia.

**Materials and Methods:** The present cross-sectional study was conducted to evaluate the sleep quality of medical students at Northern Border University, Arar, Kingdom of Saudi Arabia, from September 2024 to February 2025. Data included sociodemographic information, including lifestyle factors such as age, gender, academic year, current Grade Point Average (GPA), the self-reported skin complaints questionnaire, which includes skin symptoms commonly reported, and the last section contained the sleep condition indicator for assessing subjective sleep quality. Univariate and multivariate analyses were performed, and statistical significance was set at  $p < 0.05$ .

**Results:** A total of 317 medical students were enrolled in the study of which 179 (56.5%) were females. The average Sleep Condition Indicator (SCI) of students was 17.7 ( $\pm 5.7$ ), with 40.4% experiencing insomnia (SCI score  $< 16$ ). Over half reported taking more than 30 minutes to fall asleep, while 219 (70.9%) stayed awake for  $\leq 30$  minutes if they awoke at night. About 235 (74.1%) had sleep issues for  $\geq 2$  nights a week. The most common skin complaints were dryness in 223 (70.4%) and dandruff 212 (66.9%), with 116 (36.6%) reporting itchiness and 39.7% excoriation. Better sleep quality correlated with never having body odour, burning sensation, dandruff, feeling of disfigurement, ingrown hairs, itching, oily skin, cuticle picking, and tingling skin ( $p$ -value  $< 0.05$ ).

**Conclusion:** The current study provided evidence of poor sleep quality among the medical students, especially among medical students in early academic years. There is a strong, positive and significant relationship between many skin symptoms and poor sleep. Medical students need to be taught about good sleep behaviours and get enough sleep to promote healthy skin.

**Keywords:** Academic stress, Skin problems, Sleep disorders, Sleep hygiene, Sleep indicators

## INTRODUCTION

Sleep plays a vital role in supporting various neurological functions, particularly in maintaining synaptic homeostasis and promoting effective neural communication. Numerous studies have highlighted sleep's role in clearing neurotoxic waste products, a process that is significantly more active during sleep compared to wakefulness [1,2]. Sleep disturbances are a widespread issue among college students and have been linked to various negative outcomes, both academically and personally [3]. Several studies have identified an increased prevalence of sleep-related complaints in this population, including inadequate sleep duration, difficulty initiating and morning drowsiness, and frequent daytime napping. These sleep issues can significantly impair cognitive performance, memory retention, emotional regulation, and overall well-being [4,5].

The intense academic workload, prolonged study periods, and demanding clinical schedules commonly experienced by medical students are significant contributors to sleep disturbances and disorders [6]. Research into sleep disturbances among medical students is of particular importance because of the well-established link between sleep and mental health, as well as concerns that the intense academic demands of medical training may contribute to increased levels of stress. Poor sleep among medical students is linked to increased psychological distress and diminished academic performance. Adequate sleep plays a crucial role in maintaining their overall health and psychological well-being [7]. Students often

experience disrupted sleep-wake cycles due to sleep disorders, poor sleep habits like excessive screen time before bed, demanding academic workloads, and hectic schedules, all of which negatively impact sleep quality. Promoting awareness of sleep hygiene and encouraging healthy sleep practices among medical students is strongly recommended [8].

Sleep plays a crucial role in regulating various aspects of skin health, including surface pH, trans-epidermal water loss, blood flow, and skin temperature. The relationship between sleep and inflammation is mediated by both central and peripheral circadian mechanisms, which influence cortisol and melatonin levels, cytokine activity, and key physiological properties of the skin [9]. Sleep deprivation leads to elevated levels of cortisol; a stress hormone known to promote inflammation and potentially worsen skin conditions. During deep sleep, the body produces human growth hormone, which plays a critical role in collagen synthesis- an essential process for maintaining healthy, youthful skin [10].

Proinflammatory cytokines such as Interleukin (IL)-1, IL-6, and Tumour Necrosis Factor- $\alpha$  (TNF- $\alpha$ ) tend to rise at night and play a role in promoting sleep. Conversely, anti-inflammatory cytokines like IL-4 and IL-10 increase after waking and help suppress sleep. Disruption of sleep can interfere with the normal release of hormones and inflammatory mediators, impairing skin barrier function and aggravating skin conditions. Additionally, night time fluctuations in histamine levels and itch-inducing cytokines

can intensify symptoms, leading to increased discomfort during the night [9].

This study aimed to assess the sleep quality and its correlation with various skin symptoms among medical students.

Study Objectives

- To assess sleep quality in a sample of medical students.
- To determine the factors affecting sleep quality in medical students.
- To assess the extent and the impact of insomnia among students.
- To assess the relationship between various skin symptoms and sleep quality.

MATERIALS AND METHODS

The present cross-sectional study was conducted to evaluate the sleep quality of medical students at Northern Border University, Arar, Kingdom of Saudi Arabia, from September 2024 to February 2025. This study received approval from the Local Committee of Bioethics (HAP-09-A-043) at Northern Border University, under decision number (65\24\H) dated 02/06/2024. Informed consent, along with the study’s objectives, was provided at the beginning of the questionnaire to ensure participants were fully informed about the nature of the data being collected, as well as the measures taken to protect their privacy and maintain confidentiality.

**Inclusion criteria:** Students enrolled in the medical program at the Northern Border University from the second year through the internship year.

**Exclusion criteria:** First-year medical students and those who chose not to participate in the study.

**Sample size calculation:** The minimal sample size was estimated using the Raosoft® calculator, using the formula:

Sample size of unlimited population (n)=(n)= $\frac{(z^2 \times p(1-p))}{e^2}$

Sample size= $\frac{n}{1 + \frac{z^2 \times p(1-p)}{e^2 N}}$

with a 5% level of significance, 5% margin of error (e), 95% confidence, an expected response distribution of 50% (p), the number of students at the second year to internship is 600 (N). So, the calculated sample was 235 participants, and by adding 20% to compensate for non-response and incomplete data, the minimum sample size was 282 participants. A non probability convenient sampling method was employed to select medical students finally a total of 317 medical students were enrolled in the study.

Study Procedure

Data were collected using a structured, self-administered electronic questionnaire, which was divided into three sections. The first section focussed on sociodemographic information, including lifestyle factors such as age, gender, academic year, current GPA, place of residence, and frequency of caffeine consumption (including coffee, tea, and energy drinks), as well as health-related and behavioral data. The second section consisted of the self-reported skin complaints questionnaire [11], which included skin symptoms commonly reported in previous studies, with some additional items: hair pulling, nail biting, itchy scalp, and scaly scalp [12]. The revised questionnaire underwent a thorough validation process to ensure its accuracy and relevance. Additionally, its reliability was rigorously evaluated, confirming its consistency and dependability in measuring the intended variables. Participants’ responses were rated on a five-point Likert scale, ranging from 0 (never) to 4 (severe). The last section contained the sleep condition indicator for assessing subjective sleep quality. A validated cut-off score of 16 or less to meet the minimum criteria for assumed insomnia disorder was utilised [13].

STATISTICAL ANALYSIS

Statistical analysis was conducted using Statistics and data Special Edition (STATA/SE) version 11.2 for Windows (STATA Corporation, College Station, Texas) and Microsoft Excel. Categorical variables were summarised using frequencies and percentages, while quantitative variables were presented as mean±standard deviation. The distribution of SCI was assessed using the Shapiro-Wilk W test. To compare SCI across study groups, the Mann-Whitney test (z) and Kruskal-Wallis test ( $\chi^2$ ) were applied. The Spearman correlation coefficient ( $\rho$ ) was utilised to evaluate the relationship between SCI and the number of self-reported skin complaints. A multivariate regression analysis of SCI, conditioned on self-reported skin complaints and relevant sociodemographic confounders, was performed using the stepwise method. A p-value of <0.05 was considered statistically significant.

RESULTS

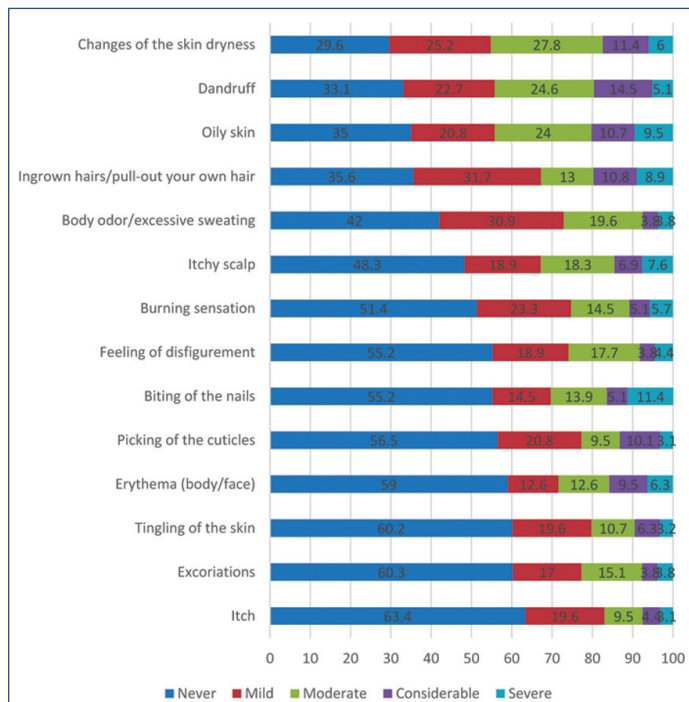
A total of 317 medical students were enrolled in the study. Females accounted for 179 (56.5%), and the highest proportion of students was in the 5<sup>th</sup> year, 141 (44.5%). About 177 (55.8%) of students reported unhealthy dietary habits, and smoking was reported by 34 students (10.7%). 273 (86.1%) students were living with their families, 277 (87.4%) students were regularly attending classes, 247 (77.9%) students had high GPAs, 247 (77.9%) [Table/Fig-1]. There were significant associations between SCI and healthy dietary habits (p<0.001). SCI was higher among students of higher academic years (p=0.0001) and non-smokers (p=0.03). Students living with their families had lower SCI compared to those living away (p=0.0001) [Table/Fig-1].

Characteristics	No.	%	Sleep condition indicator Mean±SD	Test	P	
Gender	Female	179	56.5	17.8±5.5	Z=1.38	0.17
	Male	138	43.5	18.1±6.1		
Academic year	2 <sup>nd</sup>	20	6.3	14.5±0.5	$\chi^2=51.23$	0.0001
	3 <sup>rd</sup>	40	12.6	13.5±3.2		
	4 <sup>th</sup>	40	12.6	16.6±5.8		
	5 <sup>th</sup>	141	44.5	18.4±6.0		
	6 <sup>th</sup>	56	17.7	20.7±5.4		
	Internship	20	6.3	18.7±4.9		
Dietary habits	Healthy	140	44.2	19.6±4.9	Z=5.2	<0.001
	Unhealthy	177	55.8	16.2±5.9		
Smoking	No	283	89.3	17.5±5.9	Z=2.22	0.03
	Yes	34	10.7	19.5±4.3		
Tea or coffee during the day	≤2/day	44	13.9	21.0±5.7	$\chi^2=16.21$	0.0003
	3-4/day	126	39.7	17.6±5.8		
	>4/day	147	46.4	16.8±5.4		
Living condition	Alone	28	8.8	21.2±5.0	$\chi^2=21.73$	0.0001
	Family	273	86.1	17.1±5.8		
	Room mate	16	5.1	21.2±2.5		
Attendance	Irregular	40	12.6	18.2±5.1	Z=0.92	0.35
	Regular	277	87.4	17.6±5.8		
GPA	High achiever (>4)	247	77.9	17.9±5.8	Z=0.83	0.40
	Low achiever (<4)	70	22.1	17.1±5.4		

[Table/Fig-1]: Sociodemographic details of the participants.  $\chi^2$ : Kruskal-Wallis test statistic, Z: Mann-Whitney test statistic, P: Probability; statistical significance was considered at p<0.05

The most frequent skin complaints were dryness of skin and dandruff, 223 (70.4%) and 212 (66.9%), respectively. While 116

(36.6%) of students reported varying degrees of itch, and 126 (39.7%) reported excoriation [Table/Fig-2].



[Table/Fig-2]: Self-reported skin complaints among the study participants.

The average SCI of the students was 17.7 ( $\pm 5.7$ ), with 128 (40.4%) suffering from insomnia (corresponding to SCI score  $< 16$ ). More than half of the students reported that it took them  $> 30$  minutes to fall asleep. About 235 (74.1%) of students had problems with sleep for  $\geq 2$  nights per week. Sleep quality was rated as good, average, poor, and very poor by 48 (15.1%), 135 (42.6%), 96 (30.3%), and 38 (12.0%), respectively. Poor sleep had a little effect on students' mood, energy, or relationships in 99 students (31.2%). A total of students (41.3%) reported that poor sleep somewhat troubled them in general. Overall, 102 (32.2%) of students reported sleep problems for  $> 1$  year, while 111 (35.0%) did not have a sleep problem for more than a month [Table/Fig-3].

Item	No.	%
Thinking about a typical night in the last month ...		
1. How long does it take you to fall asleep?	0-15 min	78 24.6
	16-30 min	78 24.6
	31-45 min	94 29.6
	46-60 min	26 8.2
	$\geq 61$ min	41 12.9
2. If you then wake up during the night... how long are you awake for in total? (Add all the awakenings up)	0-15 min	107 33.7
	16-30 min	118 37.2
	31-45 min	56 17.7
	46-60 min	14 4.4
	$\geq 61$ min	22 6.9
3. How many nights a week do you have a problem with your sleep?	0-1	82 25.9
	2	47 14.8
	3	68 21.4
	4	46 14.5
	5-7	74 23.3
4. How would you rate your sleep quality?	Very good	0 0.0
	Good	48 15.1
	Average	135 42.6
	Poor	96 30.3
	Very poor	38 12.0

Thinking about the past month, to what extent has poor sleep...			
5. Affected your mood, energy, or relationships?	Not at all	54	17.0
	A little	99	31.2
	Somewhat	102	32.2
	Much	62	19.6
	Very much	0	0.0
6. Affected your concentration, productivity, or ability to stay awake	Not at all	40	12.6
	A little	72	22.7
	Somewhat	106	33.4
	Much	99	31.2
7. Troubled you in general	Not at all	38	12.0
	A little	60	18.9
	Somewhat	131	41.3
	Much	56	17.7
8. How long have you had a problem with your sleep?	Not at all	32	10.1
	A little	32	10.1
	Much	32	10.1
	Very much	32	10.1
Finally, ...			
8. How long have you had a problem with your sleep?	I don't have a problem/ $< 1$ mo	111	35.0
	1-2 mnth	44	13.9
	3-6 mnth	36	11.4
	7-12 mnth	24	7.6
	$> 1$ y	102	32.2

[Table/Fig-3]: Students' responses to the sleep condition indicator for assessing subjective sleep quality.

The results showed relationships between sleep quality and the reported skin complaints among the students. Better sleep quality was associated with never having body odour/excessive sweating ( $p=0.0002$ ), burning sensation ( $p=0.02$ ), dandruff ( $p=0.0001$ ), feeling of disfigurement ( $p=0.04$ ), ingrown hairs ( $p=0.0004$ ), itching ( $p=0.03$ ), oily skin ( $p=0.01$ ), picking of cuticles ( $p=0.03$ ), and tingling skin ( $p=0.002$ ) [Table/Fig-4].

Skin complaint	No.	Sleep Condition Indicator (SCI) Mean $\pm$ SD	Mann-Whitney test statistic (Z)	p
Biting of the nails	Never	175 18.1 $\pm$ 5.4	1.06	0.29
	Yes	142 17.3 $\pm$ 6.2		
Body odour/excessive sweating	Never	133 19.2 $\pm$ 5.8	3.66	0.0002
	Yes	184 16.6 $\pm$ 5.5		
Burning sensation	Never	163 18.5 $\pm$ 5.9	2.29	0.02
	Yes	154 16.8 $\pm$ 5.5		
Changes in skin dryness	Never	94 18.8 $\pm$ 6.5	1.80	0.07
	Yes	223 17.3 $\pm$ 5.3		
Dandruff	Never	105 19.6 $\pm$ 6.1	3.92	0.0001
	Yes	212 16.8 $\pm$ 5.3		
Erythema (body/face)	Never	187 18.1 $\pm$ 6.1	0.92	0.36
	Yes	130 17.2 $\pm$ 5.2		
Excoriations	Never	191 18.0 $\pm$ 6.1	0.76	0.45
	Yes	126 17.3 $\pm$ 5.1		
Feeling of disfigurement	Never	175 18.6 $\pm$ 6.1	2.06	0.04
	Yes	142 16.7 $\pm$ 5.1		
Ingrown hairs/pull out your own hair	Never	112 19.3 $\pm$ 5.5	3.57	0.0004
	Yes	205 16.9 $\pm$ 5.7		
Itch	Never	201 18.4 $\pm$ 5.8	2.19	0.03
	Yes	116 16.5 $\pm$ 5.5		

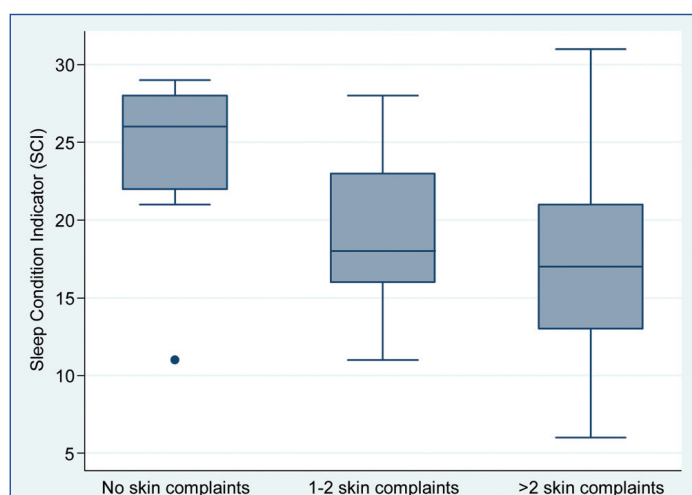
Itchy scalp	Never	153	18.1±6.5	0.76	0.44
	Yes	164	17.3±4.9		
Oily skin	Never	111	19.2±6.4	2.54	0.01
	Yes	206	16.9±5.2		
Picking of the cuticles	Never	179	18.4±5.8	2.22	0.03
	Yes	138	16.8±5.5		
Tingling of the skin	Never	191	18.6±6.1	3.06	0.002
	Yes	126	16.3±4.8		

**[Table/Fig-4]:** Relationships between skin complaints and sleep quality\* among the study participants.

Z: Mann-Whitney test, P: Probability, statistical significance was considered at  $p < 0.05$

\*Sleep quality was evaluated using the Sleep Condition Indicator (SCI)

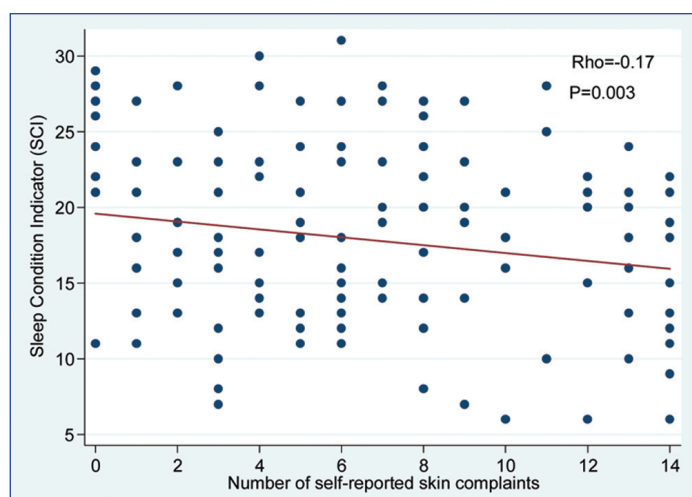
Moreover, there were significant differences in SCI between students with no skin complaints, 1-2 skin complaints, and >2 skin complaints (24.0±5.4, 19.0±4.9, and 17.1±5.6, respectively;  $p = 0.0001$ ) [Table/Fig-5].



**[Table/Fig-5]:** Comparisons of sleep condition indicator between students with no skin complaints, 1-2 skin complaints, and >2 skin complaints.

Kruskal-Wallis test statistic ( $\chi^2$ )=22.98,  $p = 0.0001$

The number of skin complaints negatively correlated with SCI ( $\rho = -0.17$ ;  $p = 0.003$ ) as shown in figure [Table/Fig-6].



**[Table/Fig-6]:** Correlation between the number of self-reported skin complaints and the sleep condition indicator among the studied students.

Rho: Spearman correlation coefficient; P: Probability, statistical significance was considered at  $p < 0.05$

Multivariate regression of SCI showed an inverse relationship between sleep quality and the number of self-reported skin complaints (regression coefficient (95% CI):-1.12 (-1.78 to -0.46);  $p = 0.001$ ). Unhealthy dietary habits were associated with lower sleep quality (-2.62 (-3.79 to -1.46);  $p < 0.001$ ). Higher academic years were associated with higher SCI (1.29 (0.83 to 1.76);  $p < 0.001$ ) [Table/Fig-7].

Predictor	Regression coefficient ( $\beta$ )	95% CI	p
<b>Number of self-reported skin complaints*</b> (no skin complaints, 1-2 skin complaints, and >2 skin complaints)	-1.12	-1.78 to -0.46	0.001
<b>Dietary habits</b> Unhealthy vs. healthy	-2.62	-3.79 to -1.46	<0.001
<b>Academic year*</b>	1.29	0.83 to 1.76	<0.001
R-square and adjusted R-square	0.21 and 0.20		
F and P	27.35 and <0.001		

**[Table/Fig-7]:** Multivariate regression analysis of students' sleep quality conditioned on self-reported skin complaints and potential confounders (dietary habits and academic year).

\*A linear variable was used to indicate a trend

## DISCUSSION

Chronic sleep insufficiency among adolescents is associated with significant health consequences, including impaired concentration, diminished cognitive function, decreased academic performance, and lower educational attainment [7]. Sleep deprivation, defined as obtaining fewer than seven hours of sleep per day in adults, has been found to adversely affect cognitive abilities. The regulation of sleep involves the modulation of adenosine levels through cytokine secretion. Additionally, excessive daytime sleepiness has been identified as a factor that negatively impacts an individual's health, safety, and overall quality of life [14]. A study conducted in Saudi Arabia indicates that sleep disturbances were prevalent across the nation [7]. To the best of our knowledge, research specifically addressing sleep disorders among medical students in Arar remains limited, rendering this study the first of its kind to examine sleep disturbances within this population and evaluate the association between sleep disorders and various dermatological parameters.

The present study revealed that 40.4% of surveyed students exhibited symptoms of sleep disturbances and insomnia, as indicated by an SCI score of less than 16. A third of participants reported that inadequate sleep compromised their ability to concentrate and remain alert, while 41.3% acknowledged that poor sleep had a general adverse impact on their well-being. These findings were consistent with previous studies, which have reported that the prevalence of inadequate sleep and insomnia among medical students in the Middle East ranges from 30.4% to 59.1%, exceeding the prevalence observed among medical students in China (27.8%) [15], but lower than that recorded among medical students in the United States (51%) [16]. This study's findings align with prior research conducted in Egypt, where 58.5% of medical students were found to suffer from poor sleep quality [17].

In Saudi Arabia, Abdulghani HM et al., documented abnormal sleep habits among more than one-third (37%) of medical students at King Saud University [18]. Furthermore, studies conducted in Riyadh by Alhusseini NK et al., Al-Khani AM et al., Almojali AI et al., and Siddiqui AF et al., identified the prevalence of sleep abnormalities among medical students to be approximately 76%, 63%, 76%, and 78%, respectively [18-22].

A study undertaken at Majmaah University by Elsadiq YM et al., identified frequent sleep-related difficulties among students, including trouble maintaining sleep (38.9%), difficulty initiating sleep (31.6%), and premature waking (27.4%) [23]. Discrepancies in prevalence rates across various studies may be attributable to differences in study populations, methodological approaches, and research designs. This study determined that sleep quality does not exhibit a significant correlation with sex, as both male and female students were exposed to similar academic conditions and risk factors. These results were consistent with those reported by Al Shammari M et al., who similarly identified no significant association between sex and sleep quality [24]. In contrast, studies conducted by Chaabane S et al., and Ahmed



Salama A reported a higher incidence of sleep disturbances among female students than their male counterparts [4,17].

Unexpectedly, the present study found no significant association between sleep quality and GPA. This finding concurs with prior research conducted in Iran, which reported no relationship between sleep quantity or quality and GPA [25]. Similarly, Alqarni AB et al., found no meaningful correlation between sleep quality and academic performance among medical students at Taif University [26]. This outcome may be attributed to students' ability to adapt to academic demands by compromising sleep. Conversely, Johns MW et al., observed that students exhibiting superior sleep quality achieved higher academic performance [27], supporting the hypothesis that poor sleep quality is associated with lower GPA scores [28]. Numerous studies corroborate these findings, indicating that students with higher GPAs tend to have better sleep quality, while lower GPA scores were linked to poorer sleep habits [7,29]. Research further suggests that sufficient nocturnal sleep enhances academic performance, whereas reduced sleep duration, late bedtimes, and excessive daytime sleepiness negatively affect educational outcomes [30]. The results of this study indicate that sleep quality improves among students in higher academic years, while sleep disturbances were more prevalent in earlier years of medical education. Similar observations were reported by Brick CA et al., who determined that first-year students experience poorer sleep quality than their senior counterparts, potentially due to heavier academic workloads [16]. Ahmed Salama A noted a high prevalence of poor sleep quality among third-year students, whereas superior sleep quality was documented among fourth-year students [17]. In another study, Alrashid FA et al., found a greater incidence of insomnia among medical students in their third to fifth years- a period characterised by heightened academic pressure and clinical responsibilities [31]. Similar findings have indicated a significant association between insomnia and advanced academic years, highlighting the rigorous demands imposed on medical students during later stages of their training [32].

Multiple lifestyle factors contribute to sleep deprivation among medical students. Poor dietary habits, excessive caffeine intake- which inhibits adenosine, a sleep-inducing neurotransmitter- and exposure to blue light-emitting screens have all been associated with disturbed sleep quality. Additionally, nicotine, a stimulant present in cigarettes, has been linked to an increased risk of snoring and sleep apnea. Excessive daytime sleepiness is also associated with lower academic performance, although caffeine intake may alleviate certain symptoms of insomnia and improve sleep quality [24]. This study observed a higher consumption of caffeine and tea among students with poor sleep quality. These results align with findings from Giri P et al., who identified a significant correlation between caffeine consumption, disrupted sleep quality, and excessive daytime drowsiness [33]. In contrast, Ahmed Salama A did not find a definitive relationship between sleep quality and coffee consumption [17].

Smoking was another factor significantly associated with poor sleep in this study, a finding consistent with Brick CA et al., who similarly reported a correlation between smoking and disturbed sleep patterns [16]. Furthermore, approximately, 70% of students in this study acknowledged that inadequate sleep negatively affected their overall well-being, with primary contributing factors including psychological stress and substantial academic workloads. Elsadig YM et al., documented a high prevalence of insomnia among medical students at Majmaah University, demonstrating a significant association between sleep disturbances and anxiety [23].

Regarding living arrangements, students residing with their families exhibited lower SCI scores than those living independently, suggesting that familial relationships may influence psychological well-being. In contrast, Hammouda M and El Rafey D found no

significant difference in sleep quality between students living with their families and those residing alone [34].

This study also examined the relationship between sleep deprivation and dermatological conditions, revealing that students with poor sleep experienced symptoms such as excessive sweating, burning sensations, dandruff, ingrown hairs, itching, oily skin, cuticle picking, and tingling sensations. Moreover, poor sleepers were more likely to express dissatisfaction with their skin appearance, report dark circles, and evaluate their facial complexion negatively.

Sleep deprivation and dermatological conditions share a bidirectional relationship, whereby severe skin disorders may result in sleep disturbances, while inadequate sleep may exacerbate skin conditions. Proper sleep is fundamental to maintaining healthy skin, as sleep-deprived individuals exhibit increased trans-epidermal water loss, potentially contributing to acne development [35]. A similar study conducted by among medical students at Tabuk University, Saudi Arabia, found a significant association between poor sleep quality and an elevated prevalence of acne and oily skin [36].

Adequate sleep provides several dermatological benefits, including improved skin elasticity, reduced inflammation, enhanced hydration, and lower stress levels. Sleep is essential for collagen production, the restoration of hydration levels, and the reduction of stress, all of which are critical for maintaining optimal skin health and preventing future dermatological issues. Medical students should receive education on healthy sleep habits, including maintaining a consistent sleep schedule, avoiding caffeine and electronic devices before bedtime, and ensuring regular physical activity to support restful sleep. Consistency in sleep and wake times, even on weekends, is crucial. Adequate sleep is also essential for healthy skin, making good sleep practices an important part of overall well-being.

### Limitation(s)

The cross-sectional nature of the study and the relatively small sample size limit its generalisability. Depending on self-reported skin complaints instead of clinical diagnoses can result in either an overestimation or underestimation of the true prevalence. In the demographic section, there were originally 11 questions, but data for only eight demographic details were included in the final dataset. Responses regarding screen time, Quran reading, and teamwork were either insufficient or omitted, leading to their exclusion. This limitation may impact the completeness of the demographic analysis and should be taken into account when interpreting the findings in future research.

### CONCLUSION(S)

Sleep disturbances are a major concern in Arar, Saudi Arabia, influenced by social, cultural, environmental, and health factors. Addressing this issue requires a comprehensive approach, including promoting healthy sleep habits, offering mental health support, and raising public awareness. Enhancing sleep quality can improve academic performance, work productivity, and overall well-being. The present highlights the high prevalence of sleep problems among medical students, particularly in the early years of their education. It also reveals a strong, positive correlation between various skin symptoms and poor sleep. Given its widespread impact, poor sleep quality remains a serious challenge affecting both the health and social well-being of medical students.

**Recommendations:** Further research is required in this field.

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