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The attitude and perception of Al Kindy medical students on the importance of sleep

A research project submitted to the Family & Community
Medicine department, Al-Kindy College of Medicine as a partial
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BY:

MARYAM MAHDI NOORI

KAWTHER MOHAMMED ABD AL_NABI

GHUFRAN TARIQ HUSSEIN

GADEER HASHEM ABD

**SUPERVISER: PROFESSOR BUSHRA
MOHAMMED MAJEED**

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=ABSTRACT=

Background:

One of the major problems among medical students is sleep deprivation and its effect on the mental and physical state. Caffeine is a well-known central nervous system stimulant yet increasing evidence shows that caffeine intake has a worsen effect on the duration and the intensity of deep sleep. Medical students need to be well aware of the critical impact that sleep has on general health.

Objective:

In this study the aim is to estimate the knowledge of Al_kindy medical students regarding how much they sleep and why it's important to get enough sleeping hours.

Methods:

This study conduct at al kindy medical collage from November 2022 to January 2023 included 304 participants from third stage, The data was collected by using a self-completed online questionnaire through Google Forms. It contained questions related to their demographic characteristics, student awareness on sleep, its relation with day-to-day activities, and their knowledge on what lack of sleep can do. Their knowledge was assessed by calculating the mean score for each question by expressing their answers as numerical values. The data was analyzed by IBM SPSS statistics 26 and Chi-square test to find a relation between their knowledge and awareness of sleep importance.

Result:

A total of 304 students from third stage participated in this study, 33.4% were male and 66,6% were female, Regarding the age (16.4%) were (>24) years old, (41.4%) were between (18_20) and the rest (42.1%) were between (20_24). regarding the hours of sleep (35.9%) sleep less than 6 hours, (17.4%) sleep more than 8 hours and the rest (46.7%) sleep between 7_8 hours. The result shows the majority of student lack of sleep come from headache (55.3%) and the minority was from other sources (13.2%), as well as that the majority of students problems during sleep caused by difficulty in waking up (42.8%). And the minority caused by other causes which is (12.5%).

Conclusion:

Medical student of third stage in general has a good daily hours of sleep however they experience lack of sleep mostly during exam seasons. Medical student need to have a well balanced schedule between their studying hours and their sleeping hours.

Keywords:

Sleep, caffeine, medical student

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=INTRODUCTION=

1/SLEEP:

Sleep is an essential component of health, and its timing, duration, and quality are critical determinants of health [1]. Sleep may play an important role in metabolic regulation, emotion regulation, performance, memory consolidation, brain recuperation processes, and learning [2]. Because of the importance of these functions, sleep should be viewed as being as critical to health as diet and physical activity. However, public health practitioners and other health care providers have not focused major attention on the importance of sleep to health[1].

Why Is Sleep a Public Health Issue? Insufficient sleep has major health consequences in adults, adolescents, and young children. Strong evidence exists that among adult's insufficient sleep has a significant effect on numerous health conditions, including chronic disease development and incidence [1]. For instance, short sleep duration (<7 hours of sleep per night) and poor sleep quality are associated with cardiovascular morbidity and metabolic disorders such as glucose intolerance, which may lead to obesity, diabetes, heart disease, and hypertension [1]. People who have short sleep duration are at 1.48 times greater risk of developing and dying of coronary heart disease than controls and 1.15 times more likely to have a stroke [3]. Children who experience short sleep duration are more likely to become obese than those who do not [4].

Insufficient sleep also affects immunologic function and development of mood disorders and is associated with depression; deficits in cognition, memory and learning; and reduced quality of life [1]. Adults who sleep fewer than 7 hours per night have greater difficulty concentrating, remembering, and performing other daily activities than those who sleep 7 to 9 hours a night [5]. Children and adolescents who get insufficient sleep have impaired behavior, mood, and performance [6].

One major consequence of insufficient sleep is daytime sleepiness, which reduces alertness and causes slow reaction time, leading to occupational and medical errors, workplace injuries, impaired driving, and motor vehicle accidents [1]. In America during 2009 , almost 5% of adults in 12 states reported that during the previous 30 days they had nodded off or fallen asleep while driving [7]. In 2005, drowsy driving contributed to 100,000 motor vehicle accidents and 15,000 deaths [8].

The public health burden of sleep deprivation is enormous. There are substantial public health investments in all areas related to sleep, from obesity and other chronic conditions to motor vehicle accidents. Insufficient sleep, unlike other health risk factors such as smoking, excessive alcohol consumption, obesity, and physical inactivity, has historically received much less attention in the public health and clinical settings. Insufficient sleep is an important public health risk factor that would benefit from further investigation[8].

2/SLEEP ASSOCIATION WITH MEDICAL PROBLEMS

Sleep duration, particularly short sleep, may influence blood pressure through disturbed autonomic balance, hormonal imbalances, increased adiposity and metabolic dysfunction, and disrupted circadian rhythms. Observational studies indicate that short and long sleep are associated with hypertension risk, reduced nocturnal dipping, and elevated morning blood pressure, but evidence is stronger for short sleep[24]. Experimental sleep restriction increases blood pressure, while sleep extension may lower blood pressure in prehypertensive individuals. Women and racial/ethnic minorities are more prone to the detrimental effects of short sleep on blood pressure. Additional studies by American Journal of Hypertension are warranted to clarify the association of objectively assessed sleep with blood pressure level and diurnal pattern and to determine the sex- and race-specific effects of sleep restriction and extension on blood pressure[9].

Evidence indicates that the association between insomnia and elevated blood pressure (blood pressure) or stage 1 and 2 hypertension is stronger in those with chronic insomnia, as compared to those with isolated insomnia symptoms, and primarily found in those with the insomnia with objective short sleep duration phenotype. There is a key gap in ambulatory blood pressure monitoring across the sleep-wake cycle as well as in randomized clinical trials testing the effectiveness of pharmacological or cognitive-behavioral insomnia therapies in lowering blood pressure. Insomnia is a strong candidate to join the list of risk factors for hypertension along with obstructive sleep apnea. In the meantime, chronic insomnia should become part of the routine assessment of patients with elevated blood pressure and should be a source for referral, diagnostic

evaluation, and treatment, rather than regarded as a symptom of the underlying medical disorder.[9]

For obesity Several pathways could link sleep deprivation to weight gain and obesity, including increased food intake, decreased energy expenditure, and changes in levels of appetite-regulating hormones, such as leptin and ghrelin. A relatively new factor that is contributing to sleep deprivation is the use of multimedia (e.g. television viewing, computer, and internet), which may aggravate sedentary behavior and increase caloric intake. In addition, shift-work, long working hours, and increased time commuting to and from work have also been hypothesized to favor weight gain and obesity-related metabolic disorders, because of their strong link to shorter sleep times. This article reviews the epidemiological, biological, and behavioral evidence linking sleep debt and obesity[10].

An adverse impact of experimental sleep restriction on insulin resistance, leading to reduced glucose tolerance and increased diabetes risk, has been well-documented. There is limited evidence indicating that sleep fragmentation without reduction in sleep duration also results in a reduction in insulin sensitivity. The adverse metabolic outcomes of sleep disturbances appear to involve multiple mechanistic pathways acting in concert. Emerging evidence supports the benefits of behavioral, but not pharmacological, sleep extension on appetite and glucose metabolism. Further research should focus on the feasibility and efficacy of strategies to optimize sleep duration and quality on obesity and diabetes risk in at-risk populations as well as those with established diseases.[10]

3/CAFFEINE EFFECTS

Caffeine (particularly in the form of coffee) is one of the most widely consumed stimulants in the world, it clearly has the potential to enhance performance not only the physical activity but also the cognitive function, but amongst its known side effects are sleep deprivation; which brings with it a risk of performance deficits. Sleep deprivation is known to lead to significant decrements in cognitive function, including lapses of attention, alertness, vigilance, and the speed of cognitive and psychomotor responses.[11]

The half-life of caffeine displays large variation across healthy adults (two to 10 h) , making it difficult to identify the appropriate time of day to discontinue caffeine intake to minimize disruptions to sleep. Currently, recommendations for positive sleep behaviors display a lack of precision in terminology. For example, the American Academy of Sleep Medicine warns that caffeine may cause sleep disruption if taken “too close to bedtime” [12], action stimulates the central nervous system with a resulting decrease in the perception of fatigue and sleepiness . For this reason, caffeine is commonly consumed throughout the day in response to insufficient sleep to promote a state of wakefulness [13]. However, the use of caffeine to stimulate wakefulness may result in impaired onset and maintenance of subsequent sleep , potentially creating a cycle of diminished sleep and subsequent caffeine reliance[14] .

Laboratory studies show that a deficit in nocturnal sleep of as little as 90 min for just one night can lead to a reduction of daytime objective alertness by one-third. By contrast, sufficient good quality sleep appears to be conducive to both improved cognitive and physical

performance that can be related to metabolic function in the brain and the body itself [15,16].

Researchers have commonly found that feeling tired in the morning leads to high caffeine use, which in turn is associated with impaired subsequent sleep patterns[23].

Other than tolerance depends on the amount of caffeine consumed, and the schedule of consumption and elimination. They use a parametric pharmacokinetic–pharmacodynamic model to suggest that it can take up to 20 h (or the equivalent of four or five half-lives) for the effects of caffeine tolerance to wear off[23].

4/THE DIFFERENT PATTERONS OF SLEEP OF SLEEP

Even though both poor sleep quality and quantity are also strongly associated with deficits in emotional, educational, neuropsychological, psychosocial health, well-being, and performance. Improved sleep shows the amelioration of these deficits[17].

Some persons are normally short sleepers who require fewer than 6 hours of sleep each night to function adequately. Long sleepers are those who sleep more than 9 hours each night to function adequately. Long sleepers have more REM periods and more rapid eye movements within each period (known as REM density) than short sleepers. Short sleepers are generally efficient, ambitious, socially adept, and content

Long sleepers tend to be mildly depressed, anxious, and socially withdrawn. Sleep needs increase with physical work, exercise, illness, pregnancy, General mental stress, and increased mental activity[17].

=OBJECTIVE=

In this study the aim is to estimate the knowledge of Al_kindy medical students regarding how much they sleep and why it's important to get enough sleeping hours.

=METHODS=

A descriptive cross-sectional study was conducted on Al-Kindy medical students. The data was collected by using a self-completed online questionnaire through Google Forms. The link to questionnaire is shared to the students through social media groups of third stage. A total of 304 students from third stage participated from November 2022 to January 2023. We divided the variables based on three main categories:

- Individual age**
- Gender**
- Hours of sleep**

The data collected was analyzed by using the program IBM SPSS statistics version 26. Tables and figures were used to display the results. The questionnaire consisted of 12 questions including:

Q/gender

Q/your age

Q/how much hours of sleep do you get per day?

Q/How many nights in a week do you have difficulty getting in your sleep?

Q/Which of these problems did you encounter during your sleep?

Q/how does lack of sleep effect your daily activities?

Q/How much does lack of sleep bother you in general?

Q/Do you suffer from any of the following

Q/When you have sleep problems, what was the most effective way that help you have a better sleep?

Q/what is the most common cause that deprived you from sleep?

Q/Do you drink caffeinated drinks (coffee ,tea ,energy drinks ,etc.) ?

Q/does caffeinated drinks have an effect on your sleeping pattern?

As shown the are related to the students general knowledge about: sleep and its impact on the general health as well as their caffeine consumption and its impact .by focusing mainly on :

- **sleep importance and the effects of sleep deprivation**
- **caffeine effects on sleep**
- **development of tolerance against caffeine**

=RESULTS=

A total number of (n=304) students from third stage participated in this study. The total number of students in third stage is (n=420) which means (72%) participated.

TABLE 1: Distribution of students by their Demographic Characteristics.

Variable		Frequency	Percentage
Gender	Female	202	66.4%
	Male	102	33.6%
Age	>24	50	16.4%
	18_20	126	41.4%
	20_24	128	42.1%
Hours of sleep	<6 hours	109	35.9%
	>8 hours	53	17.4%
	7_8 hours	142	46.7%
Total	304		

Table (1): reveals gender more female participated (66.4%) than male (33.6%). Regarding the age (16.4%) were (>24) years old , (41.4%)were between (18_20) and the rest (42.1%) were between (20_24).regarding the hours of sleep (35.9%) sleep less than 6 hours , (17.4%) sleep more than 8 hours and the rest (46.7%)sleep between 7_8 hours.

TABLE 2: The relation between age and the effect of caffeine.

Question and answer		age						P value
		18_20		20_24		>24		
Does caffeinated drinks has an effect on your sleeping pattern?	YES	count	%	count	%	count	%	.028*
		52	17.1%	74	24.3%	23	7.5%	
	NO	74	24.3%	54	17.7%	27	8.8%	

TABLE (2): show association between the age and the effect of caffeine (P value =>0.05).

IF YES:

how does lack of sleep effect your daily activities?

304 responses

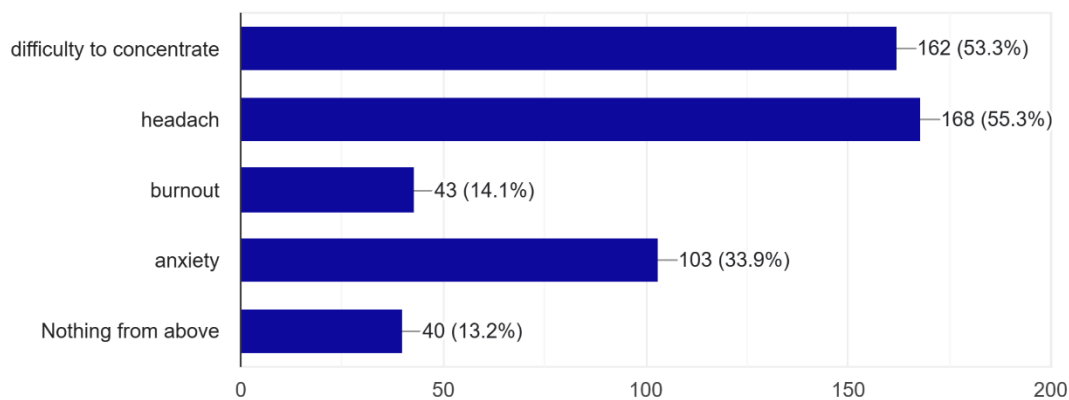


CHART (1): show the majority of student lack of sleep come from headache (55.3%) and the minority was from other sources (13.2%).

TABEL 3: Shows the relation between the hours of sleep per day and the number of nights student had difficulty sleeping.

Question and answer		Hours of sleep per day						P value
		<6		7_8		>8		
How many nights a week you have difficulty getting in your sleep?		count	%	count	%	count	%	.006**
	0 Nights	16	5.2%	36	11.8%	14	4.6%	
	1_2 Nights	45	14.8%	76	25%	27	8.8%	
	3_4 Nights	33	10.8%	20	6.5%	7	2.3%	
	5 Nights	15	4.9%	10	3.2%	5	1.6%	

TABEL (3):demonstrate that there is a highly significant value (p value =.006) between the relation of sleeping hours per day and the number of nights students had difficulty sleeping .

The difficulties shown in: Chart 2

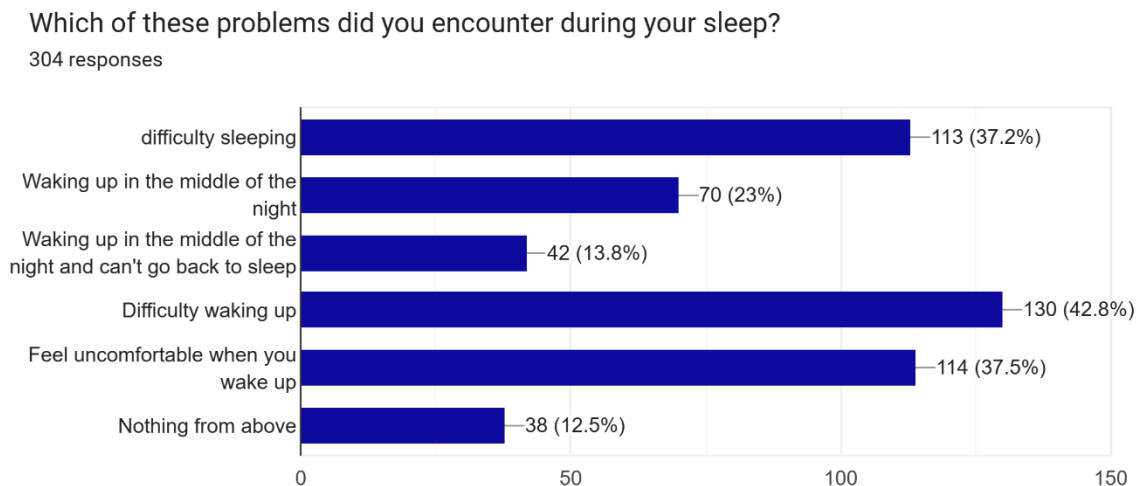


Chart (2): shows that the majority of students problems during sleep caused by difficulty in waking up (42.8%). And the minority caused by nothing from the above (Others) which is (12.5%).

CHART 3 : shows the most common causes of sleep deprivation .

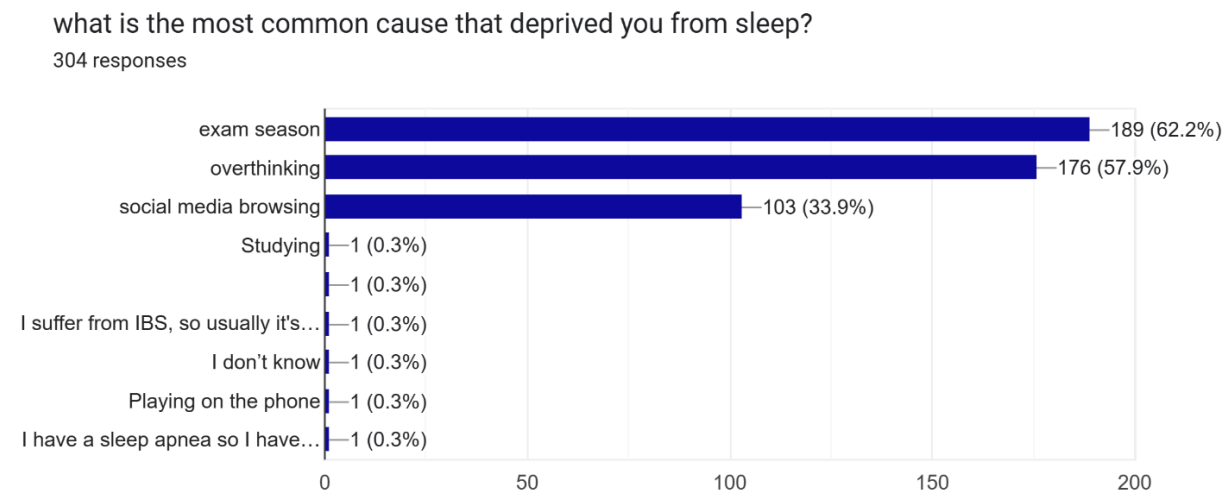


CHART (3): shows that the majority of student lack sleep during exam season (62.2%) and the minority shows multiple causes including IBS, sleep apnea (0.3%)

TABLE 4: the relation between gender and the hours of sleep.

Question and answer		Gender				P value
		Female		Male		
		Count	%	Count	%	
Hours of sleep per day?	<6	71	23.3%	38	12.5%	.928
	7-8	36	11.8%	19	5.5%	
	>8	95	31.2%	47	15.4%	

TABLE (4): shows that there is no significant relation between gender and the hours of sleep per day (p value $\Rightarrow 0.05$).

=DISCUSSION=

The purpose of this study was to assess the interplay between medical student sleep knowledge, attitude and behavior by asking general question related to sleep quantity on the first half of the questioner, the second half was related to the problems and the last questions were related to caffeine consumption.

A total of 304 participated about 202 were female who constitute 66.4% of total sample which indicate a good percentage

In comparison to male which were 102 who constitute 33.6% we found that the data was statistically not significant based on their sleeping hours , a study in (Brooklyn, New York) have reported similar observation to this result [18].

In this study there was a high significant relation between sleeping hours and the nights you have difficulty sleeping and the most common cause were difficulty waking up 42.8% as shown in, a study in Auburn University's Harrison School of Pharmacy(USA) shows a very strong positive correlation[19].

Regarding sleep deprivation it shows that the main common cause was exam season with a percent of 62.6% and second to it was overthinking 57.9% a study in turkey shows that the most common cause among student was psychological problems 67.2% and second to it was stress 64.8%[20].

Regarding difficulties encountered in daily activities due to lack of sleep it shows that the main problem was headache with a percent of 55.3% a study in United State preformed by the CDC showed that difficulty concentrating was the main problem with a percent of 19.4%[21].

Regarding it showed a significant relation between age and caffeine tolerance in which with increasing age caused an increase in tolerance in a percent of 8.8% although a study in Los Angeles showed there is no significant relation between age and caffeine tolerance (*"coffee drinkers between the ages of 65 and 70 took 33% longer to metabolize caffeine than did younger participants. A slower clearance rate means the same amount of coffee that someone has been habitually drinking would have an amplified effect"*).[22]

The different results between these studies most likely is due to the difference in location where the research was performed and difference in age group of study population (school children /adolescents) as well as the difference in representative sample of medical students.

This study has limitations; first, this study was conducted only among the medical students, second; it was limited to third stage students, third; limited time and resources and fourth; difficulties collecting data.

Finally the study was conducted in single college.

=CONCLUSION=

Medical students are continuously under high academic stress and pressure. Adequate sleep is essential to refresh them every day and help in learning and memory processing. Sleep disturbances are common in medical students and worsen their academic performance.

=RECOMMENDATION=

Medical students and their facilitators should comprehend the negative effects of sleep deprivation on student academics and should take adequate measures to improve the sleep quality of students.

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The attitude and perspective of AL-Kindy medical students on the importance of sleep

[Sleep is an essential component of health, and its timing, duration, and quality are critical determinants of health]

gender *

- ☐ Female
- ☐ Male

your age *

- ☐ 18_20
- ☐ 20_24
- ☐ >24

how much hours of sleep do you get per day? *

- ☐ <6 hours
- ☐ 7_8 hours
- ☐ >8 hours

How many nights in a week do you have difficulty getting in your sleep? *

- ☐ 0 nights
- ☐ 1-2 nights
- ☐ 3-4 nights
- ☐ 5 nights

Which of these problems did you encounter during your sleep? *

- ☐ difficulty sleeping
- ☐ Waking up in the middle of the night
- ☐ Waking up in the middle of the night and can't go back to sleep
- ☐ Difficulty waking up
- ☐ Feel uncomfortable when you wake up
- ☐ Nothing from above

how does lack of sleep effect your daily activities? *

- ☐ difficulty to concentrate
- ☐ headach
- ☐ burnout
- ☐ anxiety
- ☐ Nothing from above

How much does lack of sleep bother you in general? *

- ☐ not at all
- ☐ Few
- ☐ Many

Do you suffer from any of the following *

- ☐ high blood pressure
- ☐ diabetes
- ☐ obesity
- ☐ depression
- ☐ nothing from above

When you have sleep problems , what was the most effective way that help you have a better sleep? *

- ☐ using medications (e.g melatonin)
- ☐ drinking milk
- ☐ stay away from drinking coffee and energy drinks
- ☐ Other...

what is the most common cause that deprived you from sleep? *

- ☐ exam season
- ☐ overthinking
- ☐ social media browsing
- ☐ Other...

Do you drink caffeinated drinks (coffee ,tea ,energy drinks ,etc) ? *

- ☐ Yes
- ☐ No

does caffeinated drinks have an effect on your sleeping pattern? *

- ☐ Yes
- ☐ No