

Sleep and Academic Performance among Female Students in Al-Maarefa Colleges, 2015-2016

Abrar Sayer Al-mutairi*, Shrouq Ahmad Rahhal, Meriam Sadiq Al-abdullah, Zainab Hussain Al-ibrahim, Mada Bejad Al-mutairi, Rawan Adel Shafaay, Reem Ahmad Alanazi, Handi Adnan Al-mshel, Hadeel Maher Moqbel, Norah Abdullah Al-habshan.

College Of Medicine, Al-Maarefa Colleges for Science & Technology, Riyadh, Saudi Arabia

*Corresponding author Abrar Sayer Al-mutairi, Email: abrarsayer@gmail.com, Mobile number: +966558178877

Abstract

Background: College students experience a number of sleep problems, which may impact academic performance, health, and mood. A common sleep problem among college students is sleep deprivation and resulting in excessive daytime sleepiness (EDS).

Objective: To identify the relationship between sleep and academic performance of female students.

Methods: An observational cross-sectional study was done in Al-Maarefa colleges during the time of 2015 to 2016. Information on sleep period and quality was collected by a self-administered questionnaire distributed on a sample of 150 students.

Main findings: Almost 71% of the students felt tired many times a week and felt sleepy during the day. Moreover, 87% of the students felt sleepy in lectures long time within the week. 68% of the students had 3.1-4 GPA on the preparatory year, and only 35% of the students had 6-8 hours of the sleep per day. A strong relation was found between sleep hours on exam days and last GPA ($p=0.005$). Another relation was found between sleep hours on weekdays and the last GPA ($p=0.04$).

Conclusion: the data collected showed a high prevalence of insufficient sleep hours generally, and on nights before the exam specifically and a strong relationship between exam day sleeping hours and the final GPA. The average GPA is still high compared to the preparatory year GPA, even when the number of sleeping hours declined compared to a preparatory year.

Keywords: Sleep, Academic Performance, Female, Students

Introduction

College students experience a number of sleep problems, which may impact academic performance, health, and mood⁽¹⁾. A common sleep problem among college students is sleep deprivation and resulting in excessive daytime sleepiness (EDS). Both biological and social factors contribute to deprivation. Many college students are older adolescents and are still dealing with adolescent physiology such as a biologically driven delayed sleep phase⁽²⁾. 59% of adults 18 to 29 years of age describe themselves as night-owls. Unable to fall asleep earlier in the evening, they cannot get enough sleep if they must get up early. In addition, sleep may be voluntarily sacrificed due to social factors or involuntarily curtailed because of living in a noisy residence hall or apartment⁽³⁾. A typical coping technique for dealing with sleep deprivation is to attempt to make up for lost sleep by increasing sleep on the weekends, a practice that actually worsens the problem⁽⁴⁾. Sleep is believed to have a facilitating role in learning and memory

process. Sleep deprivation experiments conducted on humans have shown that sleep deprivation causes impairment of performance, vigilance, attention, concentration and memory⁽⁵⁾.

Sleep is defined by the medical dictionary as a period of rest for the body and mind, during which volition and consciousness are in partial or complete abeyance and the bodily functions partially suspended⁽⁶⁾. The sleep cycle is divided into 5 stages starting from a light sleep and ending in the REM stage. For a person to have a good quality sleep they must sleep through the 5 stages without any interruptions. Other factors affecting sleep is the time of sleep and number of hours slept⁽⁷⁾. According to the National Institutes of Health, the average adult sleeps less than seven hours per night. In today's fast-paced society, six or seven hours of sleep may sound pretty good, Most healthy adults (students) need between seven and a half to eight hours of sleep per night to function at their best. The healthy duration for healthy

sleep is not less than 6 hours and not more than 8 hours, to perform the work in a good way and be focused at the work time⁽⁸⁾.

The consequences of sleep problems—whether due to insufficient sleep or an untreated sleep disorder—can be serious. Sleep problems have been associated with deficits in attention and academic performance, drowsy driving, risk-taking behaviour and depression, impaired social relationships, and poorer health⁽⁹⁾. Wolfson and Carskadon reported that reduced sleep time, later bedtime and awakening, irregular sleep/wake patterns, and poor sleep quality negatively impacted adolescents' school performance⁽⁴⁾. The National Sleep Foundation found that high school students who reported insufficient sleep or daytime sleepiness also reported depressed mood and lower grades, whereas 80% of students who reported getting enough sleep made As and Bs in school. Among college students who carried a full academic load, those who reported poorer sleep quality were likely to perform worse on academic tests⁽³⁾.

Upon reading about this subject we found that many studies were done on this issue internationally, like a cross-sectional study that was done on the medical students of UFRN, in France on March of 2014. The study objective was to determine the effect of de-synchronization of the sleep-wake patterns on the quality of the academic performance. In conclusion, the study showed that students with irregular sleep patterns presented with sleepiness during daytime and demonstrated poorer academic performance and they were under higher academic load⁽¹⁰⁾. Another cross-sectional study was done in July 2014. The study was conducted on pharmacy students at Auburn University, USA. The study was done to assess the effect of sleep on the academic performance of pharmacy students. The study concluded that the average number of sleep hours needed for a healthy lifestyle is 7 hours per day, and that cognitive performance is susceptible to inadequate sleep durations⁽¹¹⁾. A cross-sectional study was done at Combined Military Hospital Lahore Medical College (CMH LMC) and Institute of Dentistry, Lahore

(Pakistan). There two aims from this study were to determine the prevalence of psychological stress and pattern of sleeping difficulties among medical students. And to explore the relationship between academic stressors, psychological stress and poor sleeping habits among medical students. It took place from August 2014 to September 2014. The Conclusion of the study revealed a high prevalence of academic stress and poor sleep quality among medical students in Lahore. Academic stressors contributed significantly to perceived stress and sleep disorders.

A cross-sectional study was done on the nursing college students of KSU, in Saudi Arabia at Riyadh city (female section). The study objectives were to discuss the relationship between the sleep deprivation and academic performance of students in the college of nursing at KSU. In conclusion, the study showed that most of the subjects' academic performance was affected by sleep deprivation and other environmental factors⁽¹²⁾. Another cross-sectional observational study was done in KSU it was conducted between December 2009 and January 2010 at the College of Medicine, King Saud University, Riyadh. This study aimed to assess the relationship between sleep habits and sleep duration with academic performance in medical students. The result showed Decreased nocturnal sleep time, late bedtimes during weekdays and weekends and increased daytime sleepiness are negatively associated with academic performance in medical students⁽¹³⁾.

Regionally, a cross-sectional, questionnaire-based, observational study carried out in spring 2009 among undergraduate students enrolled at An-Najah National University, Nablus. The aim of this study was to describe sleep habits and sleep problems in a population of undergraduates in Palestine. 400 students with a mean age of 20.2 ± 1.3 were studied. Sleep quality was reported as "poor" in only 9.8% and was significantly associated with sleep latency, the frequency of nocturnal awakenings, time of going to bed, nightmares but not with academic achievement⁽¹⁴⁾.

Problem Statement and Research Rationale:

The college experience is of great value in providing emerging adults with a structured environment in which they can gain the knowledge, skills, and independence to contribute to society; however, this experience becomes so tiring and consuming for the students' energy. Nowadays students seem to be more sleep deprived than ever, which is caused by increasing pressure and workload on the students. Sleep effect on academic performance is inevitable as researches showed the effect of sleep hours and quality on memory, cognition and mood, although the prevalence of sleep disorders in college students has not been established. It is not known whether reported sleepiness among college students is simply due to insufficient sleep or whether it might be secondary to an undiagnosed sleep disorder. In addition, sleep patterns or disorders among college students may vary by gender or race/cultural affiliation. Growing evidence suggests poor sleep patterns are related to impaired academic performance, physical health and psychological well-being. That's the reason we need to find and prove the relationship between sleep and the academic performance of students.

Objectives:

This study aimed to:

1. To describe the sleep duration and timing among girl students in Al-Maarefa Colleges 2015-2016.
2. To identify the relationship between sleep duration and timing and academic performance of girl students in Al-Maarefa Colleges 2015-2016.
3. To identify the factors affecting the sleep patterns and sleep quality of students in Al-Maarefa Colleges 2015-2016.

Material and methods:

- **Study Design:**
It is an observational cross-sectional study.
- **Study Area:**
This study was conducted in Al-Maarefa colleges of Science and Technology which is located in Al-Riyadh, KSA. It consists of 4 colleges; Medicine, Pharmacy, Applied science

and Computer science. It has female and male sections. To graduate from colleges of pharmacy, applied science, and computer science the students need to finish 5 years divided into 10 levels, while the medical college it is 6 years divided into 12 levels.

- **Study Population:**
The participants included in the study were female students studying in Al-Maarefa colleges of Medicine, Pharmacy, Applied science, and Computer science. All students at levels higher than level 8 were excluded.
- **Sampling:**
A quota sample of 150 students was surveyed.
- **Data Needs:**
 - A. Variables
Information on college, level, demography, GPA and sleep pattern was collected.
 - B. Tools
A self-administered questionnaire was used.
- **Data Analysis:**
Data were analyzed using SPSS.
- **Ethical Consideration:**
The research committee approval was taken to conduct this study. Individuals remained anonymous and they had the right to decide whether or not they get involved in this research. To ensure that confidentiality is truly protected the questionnaires were not numbered.

Results

Table (1): Only about 7% of the students slept at 8:00-9:55 p.m. on weekdays, and 48% of the students slept at 12:00-01:55 a.m. on the weekends. While 57% of the students slept after 2 a.m. on exam days.

Table (2): 52% of the students wake up at 06:00-07:55 a.m. on weekdays and 57% of the students wake up after 10 a.m. on weekends, while 30% of the students wake up 04:00-05:55 a.m. of exam days.

Table (3): 33% of the students had deep sleep on weekdays, 58% of the students had deep sleep on weekends, while only about 13% of the students had deep sleep on exam days. About 27% of the students suffered from nightmares.

Table (4): Almost 53% of the students had less than 6 hours of sleep on exam days.

Table (5): Almost 71% of the students felt tired when waking up multiple times a week, and felt sleepy during the day. While almost 87% of the students felt sleepy in lectures multiple times a week.

Table (6): 48% of the students had 3.1-4 GPA during the last semester.

Table (7): There was no relation between preparatory year GPA and number of sleep hours on prep year, (p-value is 0.213)

Table (8): there was a relation between sleep hours on weekdays and the last GPA (p-value is 0.04)

Table (9): There was a strong relationship between sleep hours on exam days and last GPA (p-value is 0.005)

Table (10): There was no relation between, sleep quality on exam days and last GPA (p-value 0.378)

Table (11) (12) (13): There were no relation between the major, level or sleep quality and duration of sleep (p-value 0.514, 0.082, 0.112).

Table(1) Bedtime on weekdays, weekends, and exam days (N=150)		
Weekdays	Frequency	Percent
before 8 pm	4	2.7
8:00-09:55	10	6.7
10:00-11:55	63	42.0
Weekends	Frequency	Percent
before 8 pm	2	1.3
08:00-09:55	1	.7
10:00-11:55	13	8.7
12:00-01:55	72	48.0
after 2 am	62	41.3
Exam days	Frequency	Percent
before 8 pm	1	.7
8:00-09:55	6	4.0
10:00-11:55	27	18.0
12:00-01:55	30	20.0
after 2 am	86	57.3
Total	150	100.0

Only about 7% of the students slept at 8:00-9:55 p.m. on weekdays, and 48% of the students slept at 12:00-01:55 a.m. on the weekends. While 57% of the students slept after 2 a.m. on exam days.

52% of the students wake up at 06:00-07:55 a.m. on weekdays and 57% of the students wake up after 10 a.m. on weekends, while 30% of the students wake up 04:00-05:55 a.m. of exam days.

Table (2) waking up on weekdays, weekends, and exam days (N=150), 2015-2016

Weekdays	Frequency	Percent
before 4 am	4	2.7
04:00-05:55	51	34.0
06:00-07:55	78	<u>52.0</u>
08:00-09:55	10	6.7
after 10 am	7	4.7

Weekends	Frequency	Percent
before 4 am	2	1.3
04:00-05:55	4	2.7
06:00-07:55	17	11.3
08:00-09:55	41	27.3
after 10 am	86	<u>57.3</u>

Exam days	Frequency	Percent
before 4 am	35	23.3
04:00-05:55	45	<u>30.0</u>
06:00-07:55	32	21.3
08:00-09:55	20	13.3
after 10 am	18	12.0
Total	150	100.0

Table (3) Sleep quality on weekdays, weekends, and exam days (N=150)

Weekdays	Frequency	Percent
Light	61	40.7
Deep	50	<u>33.3</u>
Interrupted	39	26.0

Exam days	Frequency	Percent
Light	67	44.7
Deep	19	<u>12.7</u>
Interrupted	64	42.7

Weekends	Frequency	Percent
Light	33	<u>22.0</u>
Deep	87	<u>58.0</u>
Interrupted	30	20.0

Nightmares	Frequency	Percent
Yes	40	<u>26.7</u>
No	110	<u>73.3</u>
Total	150	100.0

33% of the students had deep sleep on weekdays, 58% of the students had deep sleep on weekends, while only about 13% of the students had deep sleep on exam days. About 27% of the students suffered from nightmares.

Almost 53% of the students had less than 6 hours of sleep on exam days.

Table (4) Sleep hours on exam days (N=150)		
	Frequency	Percent
less than normal	79	<u>52.7</u>
Normal	55	36.7
more than normal	16	10.7
Total	150	100.0

Table (5) Activity level during the week (N=150)		
Feeling tired when waking up		
	Frequency	Percent
No	44	29.3
1-2 a week	62	<u>41.3</u>
3-5 a week	24	<u>16.0</u>
Everyday	20	<u>13.3</u>
Feeling sleepy during the day		
	Frequency	Percent
No	44	29.3
1-2 a week	62	<u>41.3</u>
3-5 a week	24	<u>16.0</u>
Everyday	20	<u>13.3</u>

Feeling sleepy in lectures		
	Frequency	Percent
No	19	12.7
1-2 a week	67	<u>44.7</u>
3-5 a week	39	<u>26.0</u>
everyday	25	<u>16.7</u>
Total	150	100.0

Almost 71% of the students felt tired when waking up

multiple times a week, and felt sleepy during the day. While almost 87% of the students felt sleepy in lectures multiple times a week

48% of the students had 3.1-4 GPA during the last semester.

Table (6) GPA at the study time (N=150)		
	Frequency	Percent
less than 2	19	12.7
2.1-3	59	39.3
3.1-4	72	<u>48.0</u>
Total	150	100.0

Table (7) Preparatory year sleep hours in relation to preparatory year GPA (N=150)

		Prep year GPA			Total
		less than 2	2.1-3	3.1-4	
Prep year sleep hours	less than 6	4	17	31	52
	6-8	3	8	42	53
	more than 8	2	14	29	45
Total		9	39	102	150

There was no relation between preparatory year GPA and number of sleep hours on prep year, (p-value is 0.213)

There was a relation between sleep hours on weekdays and the last GPA (p-value is 0.04)

Table (9) Sleep hours exams in relation to GPA at study time (N=150)

		GPA			Total
		less than 2	2.1-3	3.1-4	
Sleep hours exams	less than normal	8	33	38	79
	Normal	5	21	29	55
	more than normal	6	5	5	16
Total		19	59	72	150

There was a strong relationship between sleep hours on exam days and last GPA (p-value is 0.005)

There was no relation between, sleep quality on exam days and last GPA (p-value 0.378)

Table (10) Sleep hours on exam days in relation to Major (N=150)

		Major				Total
		Medicine	pharma D	respiratory therapy	nursing	
Sleep hrs on exam days	less than normal	34	29	12	4	79
	Normal	35	13	7	0	55
	more than normal	7	4	5	0	16
Total		76	46	24	4	150

Table (11) Sleep quality exams in relation to GPA at study time (N=150)

Table (12) sleep hours exam days in relation to level (N=150)

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		level			Total
		3-4	5-6	7-8	
Sleep hrs on exam days	less than normal	16	35	28	79
	Normal	12	17	26	55
	more than normal	2	7	7	16
Total		30	59	61	150

There were no relation between the major, level or sleep quality and duration of sleep (p-value 0.514, 0.082, 0.112).

Table (13) sleep hours on exam days in relation to sleep quality on exam days (N=150)

		Sleep quality exams			Total
		light	deep	interrupted	
Sleep hrs exams	less than normal	40	11	28	79
	Normal	21	4	30	55
	more than normal	6	4	6	16
Total		67	19	64	150

Discussion

In this study, it was found that high frequency of students slept at late times. In contrast, a study done in Palestine showed that 58.3% of students went to bed before midnight ⁽¹²⁾. This difference may be due to the differences in social life patterns between the two countries. This study showed a high frequency of waking up early in the morning. In contrast to the study done in Palestine that showed that only 18% of the total sample woke up before 6 am ⁽¹²⁾. This dissimilarity may be due to the difference in majors of participants.

In this study, high prevalence in participants were suffering from poor sleep quality, similarly, a study done in Saudi Arabia found that 49.15% of students suffered from bad sleep quality ⁽¹²⁾. This may be due to common social patterns and similarity in educational level. The present work identified that about half of the students had less than 6 hours of sleep on exam days. Similarly, a study done in Saudi Arabia found that 95.6% of the students get less than 6 hours /day of sleep on the final exams ⁽¹²⁾. This similarity may be because the sample taken for both studies were from similar age and educational level groups and same environment.

In this study, a relation between sleep duration and activity level during the day was found. Another study done in the USA found more than half of the

respondents (54.4%) reported feeling tired when waking up almost every day ⁽¹¹⁾. This similarity may be because the participants were from similar majors, and it's well known that little sleep hours result in tiredness in the following day.

In this study, a relation between sleep hours on weekdays and GPA was found. A similarity was found with a study done in France that showed a correlation between sleep length and academic performance ($p < 0.02$) ⁽¹⁰⁾. This similarity may be because of the similarity in the educational level of the participants. In this study a strong relationship between sleep hours on exam days and last GPA was found, similarly a study done in France showed a correlation between irregularity of sleep and academic performance ($p < 0.03$), implying that the students with a more irregular sleep-wake cycle and a shorter length of the sleep presented worse academic performance ⁽¹⁰⁾. Another study done in the USA found significant associations between final course grade and sleep duration on the night prior to an examination ($p=0.006$) ⁽¹¹⁾. Those similarities may be because participants in those studies were formed similar age groups and educational levels.

Conclusion

The data collected showed a high prevalence of insufficient sleep hours generally, and on exam nights specifically and a strong relationship between exam day sleeping hours and the final GPA. The average GPA remained high, even when the number of sleeping hours declined compared to preparatory year sleeping hours.

Recommendations

- Students should get at least 6 hours of sleep per night, especially on exam days.
- Factors that affect their sleep quality should be avoided.
- Sleep hours should be in night time better than daytime naps.
- Sleep schedules should be maintained regularly.

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