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Research Article

**THE PREVALENCE OF INSOMNIA AMONG FEMALE
MEDICAL STUDENTS OF ALMAAREFA COLLEGES IN
RIYADH CITY -KINGDOM OF SAUDI ARABIA 2015-2016****¹Dr. Mona A Alfadeel, ²Noura Alqahtani, ³Methayl Alhudaib, ⁴Shaikah Almudhee, ⁵Atheer Alghamdi, ⁶Nehal jadou, ⁷Razan Aljarbou, ⁸Danah bin Sabit, ⁹Hessah Alrajih, ¹⁰Shoog Alshammari.****Abstract:**

Background: Sleep plays an important role in every area of daily life. Insomnia can affect important aspects of your mind and body such as your mood, energy, ability to learn, memory, good judgment, reaction time and efficiency.

Objective: This study aimed to determine the prevalence of insomnia among female medical students and find out its possible association with academic performance.

Methods: 150 female medical students completed a self-administered questionnaire distributed in a cross-sectional descriptive study. Convenience sampling used for the study. SPSS was used for analysis.

Result: This study showed that 74% of the participants were suffering from insomnia. Insomnia was 85% among those who had the medical condition than those who did not. 77% of the participant who is in level 7 and more had insomnia while 78% of the insomniac students were between 21-23 years old. Insomnia occurred in 75% with GPA of 3 or more in the preparatory year and in the current level (P -value = 0.613). These results were statistically insignificant. 74% of insomniac students spend 3-4 hours during weekdays in studying and that increased by 79% before exams to spend more than 6 hours and this finding was on the borderline significant (P value = 0.0569).

Conclusion: This study showed a significant relationship between insomnia and studying hours in exam weekdays, Academic performance in this study did not show relationship with insomnia, Insomnia was statistically associated with GPA more than 3 out of 4 at the time of the study and in preparatory year and the presence of medical condition was statistically associated with insomnia.

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INTRODUCTION:**Background:**

Sleep plays a tremendous role in learning, memory and many other vital functions that justify a large amount of time we spend at sleep. Similarly, sleep disturbances, also known as Insomnia that may negatively affect the productivity of the individual. [1] Insomnia is a sleep disorder that is characterized by difficulty falling and/or staying asleep. People with insomnia have one or more of the following symptoms: Difficulty falling asleep, Waking up often during the night and having trouble going back to sleep, Waking up too early in the morning, Feeling tired upon waking [2], and that occurs at least 3 times per week and has been a problem for at least 1 month. [3]

The International Classification of Sleep Disorders recognizes three major types of insomnia: short-term insomnia lasts for days or weeks, chronic insomnia lasts for months or longer, and other insomniacs. [4] A general consensus has developed from population-based studies that approximately 35% of a variety of adult samples drawn from different countries report one or more of the symptoms of insomnia. Still, it is hard to say how many people have insomnia because different people have different definitions of insomnia and the condition is under-reported and underdiagnosed. [5]

PROBLEM STATEMENT AND RATIONALE:

Students are at particular risk for sleep problems as they often have a constantly changing sleep-wake cycle due to class work, exams, social issues, and environmental factors like noisy roommates. Studies have shown that insomnia is more common among college students and can result in stress, depression and reduced academic performance. [6]

Insomnia is a significant and prevalent public health problem. And it is the most common of all sleep disorders and affects between 30-50 percent of people during their lives. 30 to 35% have brief symptoms of insomnia. 15 to 20% have a short-term insomnia disorder. 10% have a chronic insomnia disorder. One in three people suffers from some form of insomnia during their lifetime. Medical students are one subgroup of the general population who appear to be especially vulnerable to poor sleep, perhaps due to the long duration and high intensity of study. [7]

In a Chinese study, 19% of the medical students were found to have poor sleep quality, with differences seen between years of study but not between genders. [8]

Also in a study done in Brazil, 28.2% of medical students found had insomnia; females had more difficulty in maintaining sleep than males, and males were more likely to report "falling asleep later. [9]

In a study in Saudi Arabia to examine the prevalence of sleep disorder among medical students and investigate any relationship between sleep disorder and academic performance. 36.6% of participants were considered to have abnormal sleep habits, with a statistically significant increase in female students. A high prevalence of sleep disorder was found in this group of students, specifically female students. [10]

Insomnia is a scourge for all age groups because the lack of sleep can cause a serious effect on the human body. Nowadays a high percentage of the population in modern society suffers from various kind of insomnia due to the impact of increased physiological socio-cultural stress factors. This research will estimate the prevalence of insomnia in female medical students and since limited information is available regarding insomnia among Saudi female medical students. It is important to first understand what could be causing of students sleep difficulties.

OBJECTIVES:

General objective:

To study the prevalence of insomnia among female medical students of Almaarefa colleges in Riyadh city –Kingdome of Saudi Arabia 2015-2016.

Specific objective:

- 1- To determine the prevalence and pattern of insomnia among female medical student of Almaarefa colleges in Riyadh city – Kingdome of Saudi Arabia 2015-2016.
- 2- To determine the association of insomnia with academic performance in female medical student of Almaarefa colleges in Riyadh city –Kingdome of Saudi Arabia 2015-2016.

LITERATURE REVIEW:

Medical students are exposed to a significant level of pressure due to academic demands. Their sleep pattern is characterized by insufficient sleep duration, delayed sleep onset, and occurrence of napping episodes during the day. Stress among medical students induced by academic pressures is on the rise among the student population in the world. [10]

The study was done to examine the relationship between two different systems employed to assess academic performance and the levels of stress among students at two different medical schools in Karachi, Pakistan on 24 June 2015. A sample consisting of 387 medical students enrolled in pre-clinical years

was taken from two universities, one employing the semester examination system with grade point average (GPA) scores, and the other employing an annual examination system with the only pass/fail to grade. There were a higher proportion of females in the GPA system. Students in the pass/fail assessment system had a lower score on the WTAS, indicating lower levels of test anxiety and overall stress than in students enrolled in the GPA assessment system. More students in the pass/fail system were satisfied with their performance than those in the GPA system. [11]

A cross-sectional study covers 400 medical students of first to seventh years and residents of Iran University of Medical Science between December 2007 and February 2008, to determine the prevalence of insomnia in medical student and residents. The result was reported as "perfect" in only 14%. 44% and 30% reported as "good" and "fair" satisfaction and 1.5% reported as "very poor". This survey on insomnia in the medical students and residents showed a high prevalence of insomnia in young medical students and it's greater in female [12].

Another study conducted in a medical college in Delhi in 2015. The aim of the study was to study the prevalence of anxiety and insomnia among the medical students in a tertiary care hospital in Delhi. A total of 215 medical students were enrolled in the study. The prevalence of insomnia was found to be 30.31% (57/188) and its distribution among the students studying in various professionals. Among the 58 students studying in the 1st professional, [16] were found to have insomnia. Only 1 student out of 28 in the 2nd professional was found to be suffering from insomnia. 17 out of 60 students were found to be suffering from insomnia in the 3rd professional part. In 3rd professional part II, 23 students out of 42 were found to be suffering from. Prevalence of insomnia was highest in students studying in 3rd professional part II which were found to be statistically significant. [13]

A cross-sectional study was done at the Combined Military Hospital Lahore Medical College and the Institute of Dentistry in Lahore (CMH LMC), Pakistan. Studying the relation between academic stress and sleeping difficulties. Students enrolled in all yearly courses for the Bachelor of Medicine and Bachelor of Surgery (MBBS) degree were included. Logistic regression analysis showed that cases of high-level stress were associated with the year of study and academic-related stressors only .

Univariate analysis identified 157 cases with high-

stress levels (59.7%). The mean (SD) PSQI score was 8.1 (3.12). According to the PSQI score, 203/263 respondents (77%) were poor sleepers. Logistic regression showed that mean PSS-14 score was a significant predictor of PSQI score (OR 1.99, $P < 0.05$). [14]

A cross-sectional study was done in Qazvin in March 2013, to study the Prevalence of insomnia and its relation with the academic performance of medical students. The results showed that sleep duration of medical students was short, no clinical significant of having insomnia in 28.8% of students but 71.2% of students had the severity of insomnia and there is a reversible relation between lower sleep hours and academic achievement. [15]

The main objective of this study is to describe sleep practices among undergraduate medical students in a Nigerian University. A total number of participants enrolled were 241 consisting of 150 male and 90 female medical students. The median number of hours of night sleep on a weekday and weekend were 6 and 7 h respectively. There was a significant correlation between the number of hours of sleep and use of caffeine (Spearman $r = -0.148$, $P < 0.0321$). Ninety-two (45.3%) had a sleep latency of 10-30 min while 157 (70.7%) woke up 1-2 times/night. Twenty-five (11.3%) experience unusual sleep practices such as sleepwalking, talking or night terrors. Then conducted that medical students in their institution have varying degrees of sleeping practice and behavior and this may affect academic performance . [16]

A cross-sectional study was done to Evaluate Insomnia in Medical Students of Kurdistan University in 2007. The sample size included 244 people who entered into this study by the use of randomized systematic sampling method. A researcher-made screening questionnaire which had been designed on the basis of DSM-IV was used for data registration. They found a high prevalence rate of insomnia in medical students in this study. 57.4% of the students had insomnia that 66.7% of them resided in the dormitory and 36.8% in their own houses [17].

A cross-sectional self-administered questionnaire-based study was conducted over a 4-week period during the 2009–2010 academic years at the College of Medicine, King Saud University, Riyadh, Kingdom of Saudi Arabia, to examine the prevalence of sleep disorder among medical students and investigate any relationship between sleep

disorder and academic performance. The participants in this study were 900 healthy male and female students from the first, second, and third academic years. A high prevalence of sleep disorder was found in this group of students, The ESS score demonstrated that 36.6% of participants were considered to have abnormal sleep habits, with a statistically significant increase in female students, sleeping between 6–10 h per day was associated with normal ESS scores as well as the academic grades. Abnormal ESS scores were associated with lower academic achievement. Analysis of the relationship between sleep disorder and academic performance indicates a significant relationship between abnormal ESS scores, total sleeping hours, and academic performance. [10]

Sample size:

Here are the formulas that were used to calculate the Sample Size :18

$$ss = \frac{Z^2 * (p) * (1-p)}{c^2}$$

Where :

1. Confidence level (Z) = how confident do you want to be that the actual mean falls within your confidence interval? The most common confidence intervals are 90% confident, 95% confident and 99% confident. Z value (e.g. 1.96 for 95% confidence level.)
2. Prevalence Size (p) = 0.5% (e.g. 0.5 used for sample size needed).
3. Margin of Error (confidence level) (c) = confidence interval (e.g., 0.05 = ± 5)

So the sample size = 384.16 \longrightarrow 385 respondents are needed .

NB: because of limited time and response we take 150 responders only.

Sample technique:

Convenience sampling was used for the study.

Data collection method and tools:

A close-ended, specially designed, pre-tested questionnaires were used. it contained Athens insomnia scale to establish the diagnosis of insomnia and insomnia severity index to assess the nature, severity, and impact of insomnia. it was self-administered questionnaires. Insomnia was defined as a persistent disorder that causes difficulty falling asleep, waking up frequently during the night with difficulty returning to sleep, waking up too early in the morning, or unrefreshing sleep. And that occurs at least 3 times per week and has been a problem for at least 1 month. Short-term insomnia lasts for days or weeks is brief and often happens because of life circumstances, chronic insomnia occurs at least three nights per week and lasts at least three months .

METHODOLOGY:

Study design:

It was an observational descriptive cross-sectional study design.

Area:

The study was conducted at Almaarefa colleges for science and technology (MCST), At Diriyah, in the Kingdom of Saudi Arabia, it includes female students are Studying at the College of Medicine.

Population:

The study was conducted at private female medical university in Riyadh, Kingdom of Saudi Arabia. It includes female medical students of level 4 till level 8, excluded other levels.

Data analysis:

Cleared and analyzed by a statistical package of social science (SPSS). Then the result was presented in tables as categories and percentages. The chi-square was used as a test of significance. The p-value should be less than or equal 0.05 to be considered significant.

Guidelines for Scoring/Interpretation :

- 1) Athens insomnia scale It is measured by assessing eight factors (as tabulated below) amongst which first five factors are related to nocturnal sleep and the last three factors are related to daytime dysfunction. These are rated on a 0-3 scale and the sleep is finally evaluated by the cumulative score of all factors and reported as an individual's sleep outcome. Over the period of time, AIS is considered to be an effective tool in

sleep analysis, and it is validated in various countries based on the local patients. A cut-off score of ≥ 6 on the AIS is used to establish the diagnosis of insomnia.

2) Insomnia Severity Index has seven questions. Designed to assess the nature, severity and impact of insomnia .

Add the scores for all seven items (questions 1 + 2 + 3 + 4 + 5 +6 +7) = _____ your total score

Total score categories :

0-7 = No clinically significant insomnia.

8-14 = Subthreshold insomnia.

15-21 = Clinical insomnia (moderate severity)

22-28 = Clinical insomnia (severe)

Ethical issue:

Verbal consent was obtained from all participants. Confidentiality of the data was ensured and maintained.

RESULTS:

Table (1): showed that 66% of the participants aged from 21 to 23 years, and 42% of the participants were from the level 6 to 7.

Table (2): showed that the GPA was at least 3 in 70% of the participants in the preparatory year and 53.3% at the time of the survey .

Table (3): showed that 44% of the participants used to study 3 to 4 hours per weekdays and 54% of the participants study more than 6 hours per weekdays before the exam.

Table (4): showed that 32.7% of the participants used to study more than 6 hours per weekends. and 84% of the participants study more than 6 hours per weekends before the exam .

Table (5): showed that 27% of the participants had medical conditions, and 11.3% had a chronic disease.

Table (6): showed that 74% of the participants were suffering from insomnia.

Table(7): Showed that 77% of the participant who was beyond level 7 and more had insomnia. While 78% of the insomniac student was between 21-23 years old. There was no statistical association between insomnia and age or level of the students.

Table (8): Insomnia occurred in 73% with GPA of 3 or more in preparatory year. And 76% with GPA of 3 or more in the current level. But the evidence does not suggest an association between insomnia and GPA .

Table(9): showed that 72% of participants studying hours per weekdays was less than 5, 78.5% spend between 5-6 hours and 78% spend more than 6 hours. During exam weekdays 80.6% of participants spend less than 5 hours of study while 57.9% of them spend 5-6 hours and 79% spend more than 6 hours. The finding was statistically significant. (P=0.0319)

Table (10): showed that 73% of participants studying hours per weekend was less than 5, 71% spend between 5-6 and 78% spend more than 6 hours. During exam weekends 86% of participants spend less than 5 hours, 59% of them spend between 5-6 hours while 75% spend more than 6 hours. The finding was not statistically significant.

Table (11): insomnia occurred in 85% of participants who had medical conditions and in 70% of the participant who didn't have medical conditions. The findings were on the borderline significant. (P=0.0516).

Table (1): Age and Level of the participants. (N: 150)

Age	Frequency	Percent
18-20	40	26.7
21-23	99	66.0
24-26	11	7.3
level	Frequency	Percent
4-5	40	26.7
6-7	63	42.0
>7	47	31.3
Total	150	100.0

Table (2): GPA in the preparatory year and current level. (N: 150)

GPA in a preparatory year	Frequency	Percent
<2	13	8.7
2-<3	32	21.3
=>3	105	70.0
GPA in this level	Frequency	Percent
<2	17	11.3
2-<3	53	35.3
=>3	80	53.3
Total	150	100.0

Table (3): study hours per weekdays. (N: 150).

study hours per weekdays	Frequency	Percent
1-2	38	25.3
3-4	66	44.0
5-6	28	18.7
>7	18	12.0
study hours per weekdays before the exam	Frequency	Percent
1-2	6	4.0
3-4	25	16.7
5-6	38	25.3
>6	81	54.0
Total	150	100.0

Table(4): Study hours per weekend. (N: 150).

Study hours per weekend	Frequency	Percent
1-2	27	18.0
3-4	39	26.0
5-6	35	23.3
>6	49	32.7
study hours per weekends before the exam	Frequency	Percent
1-2	2	1.3
3-4	5	3.3
5-6	17	11.3
>6	126	84.0
Total	150	100.0

Table (5): Medical conditions. (N: 150).

Medical conditions	Frequency	Percent
chronic disease	17	11.3
chronic pain	4	2.7
obesity	13	8.7
Other medical conditions	7	4.7
None	109	72.7
Total	150	100.0

Table (6):Insomniac or Non-insomniac. (N: 150).

Score	Frequency	Percent
insomniac	111	74.0
non-insomniac	39	26.0
Total	150	100.0

Table 7: Level and age with Insomnia. (N:150).

level	Insomniac	Non- Insomniac	Total
4-5	27	13	40
6-7	48	15	63
>7	36{77%}	11	47
Age	Insomniac	Non-Insomniac	Total
18-20	27	13	40
21-23	77{78%}	22	99
24-26	7	4	11
Total	111	39	150

Table 8: GPA in the preparatory year, and current level GPA and Insomnia. (N:150).

GPA in a preparatory year	Insomniac	Non-Insomniac	Total
1.5<2	9	4	13
2-<3	25	7	32
>=3	77{73%}	28	105
Current level GPA	Insomniac	Non- Insomniac	Total
1.5-<2	11	6	17
2<3	39	14	53
=>3	61{76%}	19	80
Total	111	39	150

Table 9: study hours per weekdays and insomnia (N:150).

study hours per weekdays	Insomniac	Non-Insomniac	Total
>5	75 (72%)	29	104
5-6	22 (78.5%)	6	28
>6	14 (78%)	4	18
study hours in exam weekdays	Insomniac	Non-Insomniac	Total
<5	25 (80.6%)	6	31
5-6	22 (57.9%)	16	38
>6	64 (79%)	17	81
Total	111	39	150

Table 10: Study hours per weekends and insomnia (N:150).

study hours per weekends	Insomniac	Non- Insomniac	Total
<5	48 (73%)	18	66
5-6	25 (71%)	10	35
>6	38 (78%)	11	49
study hours on exam weekends	Insomniac	Non-Insomniac	Total
<5	6 (86%)	1	7
5-6	10 (59%)	7	17
>6	95 (75%)	31	126
Total	111	39	150

Table 11: Medical conditions and insomnia (N: 150).

Medical conditions	Insomniac	non- Insomniac	Total
Medical conditions	35 (85%)	6	41
None	76 (70%)	33	109
Total	111	39	150

DISCUSSION:

According to this study, the highest prevalence found at the age from 21 to 23 years students and at the level 7-8. Contrast findings found in Delhi The

highest prevalence was found at the age18 students (25.6%) and at the first year students (14%). The finding was not statistically significant Because of different cultures, lifestyle, different teaching

methods and teaching environment.[13]

This study found there was a statistical association between medical condition presence and insomnia. Similar to the study that conducted in Riyadh medical students found that 45% of them had insomnia related to a medical condition. This similarity may be due to the same specialty and levels.

This study showed a high proportion of participant had insomnia in the preparatory year, and in the level at the time of the study, with GPA three out of four. The finding showed that no association between academic performance and insomnia. This comes in accordance with the similar study which was conducted at "Alfaisal University "showed no correlation between the student GPA's and insomnia. In contrast to a study in " King Saud University" showed a high prevalence of sleep disorder with 36.6% of participants as well 28.5% of participants had a lower academic achievement. As the GPA was mentioned by respondent and not from academic affairs, so it could be lower. [10]

CONCLUSION:

This study showed a significant relationship between insomnia and studying hours in exam weekend, Academic performance in this study did not show relationship with insomnia, Insomnia was statistically associated with GPA more than 3 out of 4 at the time of the study and in preparatory year and the presence of medical condition was statistically associated with insomnia.

RECOMMENDATIONS:

*Behavior therapy and lifestyle changes are often recommended as the initial treatment for insomnia such as:

1. Students should get enough sleep.
2. Maintain a constant sleeping and waking time.
3. Treat the factors that related to insomnia such as medical conditions.
4. Students should adopt habits that could minimize insomnia such as exercise regularly and read the Quran.

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Annexure:

We're students of Al-Maarefa university , college of medicine. “**The Prevalence of insomnia among female of the college of medicine**”. Insomnia is a disorder that causes difficulty falling asleep, waking up frequently during the night with difficulty returning to sleep, waking up too early in the morning. And that occurs at least 3 times per week and has been a problem for at least 1 month.

Any given information will be used for research purposes only and confidentiality will be maintained and highly appreciated.

Personal information:

1- Age: years.

2-Your Level: 4 5 6 7 8

3-GPA in preparatory year:

1.5-less than2 2- less than 3 3 and above

4-GPA in this level:

1.5-less than2 2- less than 3 3 and above

5-Study hours per weekdays:

1 - 2 3 - 4 5 - 6 more than 6 hours

6-Study hours per weekends:

1 - 2 3 - 4 5 - 6 more than 6 hours

7-Study hours per weekdays before the exam:

1 - 2 3 - 4 5 - 6 more than 6 hours

8-Study hours per weekends before the exam:

1 - 2 3 - 4 5 - 6 more than 6 hours

9-Medical conditions:

- Chronic disease (asthma, diabetes, hypertension, etc..)
- Chronic pain
- Obesity
- Endocrine problems such as hyperthyroidism
- Other medical condition
- None above

Athens insomnia scale

This scale is intended to record your own assessment of any sleep difficulty you might have experienced. Please, check (by circling the appropriate number) the items below to indicate your estimate of any difficulty, provided that it occurred at least three times per week during the last month.

- 1) Sleep induction (time it takes you to fall asleep after turning off the lights)
 - 0: No problem
 - 1: Slightly delayed
 - 2: Markedly delayed
 - 3: Very delayed or did not sleep at all

- 2) Awakenings during the night
 - 0: No problem
 - 1: Minor problem
 - 2: Considerable problem
 - 3: Serious problem or did not sleep at all

- 3) Final awakening earlier than desired
 - 0: Not earlier
 - 1: A little earlier
 - 2: Markedly earlier
 - 3: Much earlier or did not sleep at all

- 4) Total sleep duration
 - 0: Sufficient
 - 1: Slightly insufficient
 - 2: Markedly insufficient
 - 3: Very insufficient or did not sleep at all

- 5) Overall quality of sleep (no matter how long you slept)
 - 0: Satisfactory
 - 1: Slightly unsatisfactory
 - 2: Markedly unsatisfactory
 - 3: Very unsatisfactory or did not sleep at all

- 6) A sense of well-being during the day
 - 0: Normal
 - 1: Slightly decreased
 - 2: Markedly decreased
 - 3: Very decreased

- 7) Functioning (physical and mental) during the day
 - 0: Normal
 - 1: Slightly decreased
 - 2: Markedly decreased
 - 3: Very decreased

- 8) Sleepiness during the day
 - 0: None
 - 1: Mild
 - 2: Considerable
 - 3: Intense

Score:

Insomniac

Non-insomniac

Insomnia Severity Index

Please CIRCLE the number that best describes the CURRENT (i.e. LAST 2 WEEKS) SEVERITY of your insomnia problem(s).

Insomnia Problem	None	Mild	Moderate	Severe	Very Severe
1. Difficulty falling asleep	0	1	2	3	4
2. Difficulty staying asleep	0	1	2	3	4
3. Problems waking up too early	0	1	2	3	4

How SATISFIED/DISSATISFIED are you with your CURRENT sleep pattern?

Very Satisfied Satisfied Moderately Satisfied Dissatisfied Very Dissatisfied
 0 1 2 3 4

4. How NOTICEABLE to others do you think your sleep problem is in terms of impairing the quality of your life?

Not at all
 Noticeable A Little Somewhat Much Very Much Noticeable
 0 1 2 3 4

5. How WORRIED are /DISTRESSED you about your current sleep problem?

Not at all Worried A Little Somewhat Much Very Much Worried
 0 1 2 3 4

6. To what extent do you consider your sleep problem to INTERFERE with your daily functioning (e.g. daytime fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) CURRENTLY?

Not at all
 Interfering A Little Somewhat Much Very Much Interfering
 0 1 2 3 4

8-Score :

None Mild Moderate Severe

Thank you for your kind participation