



Journal Homepage: -www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/6960
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/6960>



RESEARCH ARTICLE

SLEEP PATTERN AMONG STUDENTS OF MEDICAL COLLEGE, HAIL UNIVERSITY, HAIL, KSA.

Afnan A. Alhazimi¹, Ghaida M. Alahmadi¹, Manal A. Alhamazani¹, Taif Alruwaili¹, Madiha R. Mahmoud²
 and Sasikumar Dhanarasu³.

1. Students in College of Medicine, Hail University, P.O. Box 2440, Hail, KSA.
2. Professor in Pharmacology & ³Assistant Professor in Biochemistry Departments, College of Medicine, Hail University, P.O. Box 2440, Hail, KSA.

Manuscript Info

Manuscript History

Received: 16 February 2018
 Final Accepted: 18 March 2018
 Published: April 2018

Keywords:-

Insomnia, Parasomnia, Sleep
 Pattern, Medical College students,
 Hail University, KSA.

Abstract

Background: Among medical students, high levels of stress and emotional exhaustion have been associated with sleep problems. Recent researches have indicated a significant relationship between sleep patterns with academic and performance academic stressors contributed significantly to stress and sleep disorders in medical students.

Objectives: This study aims to assess the sleep pattern and the prevalence of sleep disorder among sample of healthy medical students in Hail University, Hail, Saudi Arabia.

Methods and subjects: About 213 out of 400 students from the Medical Colleges, Hail University, KSA starting from 2nd year to 6th year are responding to the questionnaire 156 (73.2% females) and 57 (26.8% males). The questionnaire consists of 34 closed questions, arranged in 6 subscales. It includes six questions about the demographic characteristics; four questions about lifestyle, six questions about sleep/awake habits characteristics, four questions about insomnia-related symptoms, six questions about symptoms of parasomnia, six questions about cognitive and psychomotor behaviors, and lastly, two questions about self perception of sleep satisfaction and use of sleeping pills.

Results: Sleep pattern of medical students showed a significant difference among the students in the 3rd year (68.1%) and other students in 2nd year & clinical years in going bed more than 24 o'clock. Another significant difference was found between students in the 2nd year (78%) and other students in getting up in the morning < 7 o'clock, but students in clinical years (54.3%) showed high significant difference compared other students in getting up in the morning > 7 o'clock. Clinical years (45.6%) students took daytime naps from 60-120 minutes which is more significant difference from other students. Also, there was no significant differences between gender and parameters of insomnia except in the time taken to fall asleep each night, female students showed high percent compared to male students (5-10 min) and (26-40 min) While, high percent of male students fall in sleep more than female (11-25 min). About 12.0% of 2nd year students waked up 5-7 times in middle of nights more than other students as insomnia

parameter. Male students never or rarely had bad dreams or speaking during sleep compared to female students as parasomnia parameter. Students in clinical years (91.4%) didn't show walking during sleep compared to other students. There was a significant difference between students took sleeping pills (78.9%) and difficulty in initiating sleep compared to (46.4%) who did not take sleeping pills. About 77.8% of students having perfect sleep satisfaction and had no difficulty to initiate sleep. Also, these students fell asleep directly after 5-10 minutes with perfect sleep satisfaction.

Recommendation: Further researches are needed to study the effect of using phones on sleep hygiene and the correlation between the type of medical curriculum and the sleep pattern of medical students.

Copy Right, IJAR, 2018. All rights reserved.

..... **Introduction:-**

Medicine is one of the most stressful fields of education because of many things such as highly demanding professional and academic requirements (Waqas et al., 2015). Extensive medical curricula, frequent examinations and fear of failure cause stress and anxiety for medical students, who may cut short their leisure activities and hours of sleep to be able to achieve their goals (Shah et al., 2010). Sleep is very essential for person's health, memory consolidation and wellbeing, to enhance learning and athletic performance and decision-making. Sleep deprivation has various consequences including sleepiness and impairments in neuro-cognitive and psychomotor performance (Pilcher & Huffcut, 1996 and Harrison & Horne, 2000). Also, it is a common sleep problem among college students that can induce excessive daytime sleepiness (Jain and Sandeep Verma, 2016). The most commonly reported complaints being difficulty falling asleep, difficulty maintaining sleep, early morning awakenings; poor sleep quality, early morning fatigue and sleepiness, and daytime napping (Brown et al., 2002). Medical students are considered a population that is particularly prone to sleep-related problems (Alsaggaf et al., 2016). (Nojomi et al., 2009) showed that Sleep disturbances are an important issue among medical students and residents and associated with age, gender, living conditions, doing exercise, and workload. High levels of stress (Dyrbye et al., 2006, Pagnin et al., 2014) and emotional exhaustion (Alsaggaf et al., 2016) among medical students have been associated with sleep problems. In addition, recent researches showed a significant relationship between sleep patterns with academic performance (Jain and Sandeep Verma, 2016). Also, other study showed that the academic stressors contributed significantly to stress and sleep disorders in medical students (Waqas et al., 2015). So, the aim of this study is to assess the sleep pattern and the prevalence of sleep disorder in a large sample of healthy medical students in Hail University, Hail, Saudi Arabia.

Materials and Methods:-

Sample and study area:-

This study was conducted on medical students of Hail University, Hail, Saudi Arabia in 2017-2018. The questionnaires were distributed in break time for students from 2nd to 6th years in which the intern students excluded. This university has male and female medical college separately so we obtain the aid of male academic affairs because the difficulty of self administration. In totally the number of students about 400 we receive 213 responses with exception for students with known sleep disorder. The questionnaire was provided with translation to Arabic language and without names or ID of students to be clearer and more confidential, irrespectively. In addition, we explained for the students the aim of the study and illustrate some questions.

Instrument:-

The questionnaires are obtained from a previous study (Nojomi et al., 2009) which was made according to DSM-IV criteria and Pittsburg sleep quality index (Buysse et al., 1989). Both the reliability and validity of the questionnaire was measured by the inventors. The questionnaire consists of 34 closed questions, arranged in 6 subscales. It includes six questions about the demographic characteristics; four questions about lifestyle, six questions about sleep/awake habits characteristics, four questions about insomnia- related symptoms, six questions about symptoms of parasomnia, six questions about cognitive and psychomotor behaviors, and lastly, two questions about self perception of sleep satisfaction and use of sleeping pills.

Statistics:-

Data were analyzed by the IBM SPSS version 22 with significance level was at $P < 0.05$. Frequency and chi square test were used to present the distribution of nominal variables.

Results:-

About 213 students from the Medical Colleges, Hail University, KSA starting from 2nd year to 6th year are responding to the questionnaire 156 (73.2% females) and 57 (26.8% males). The ages of participants ranged from 18 to 25 years old.

Figure 1 showed the sleep/awake habits characteristics of students, the comparisons between students in 2nd year, 3rd year as the two groups studying basic sciences and students that starting clinical sciences (4th year -6th year) were done. The number of students that participate in this study were 50 (23.4% from 2nd year), 47 (22.1% from 3rd year) and 116 (54.5% from 4th to 6th year). The percent of married females and males is 5.1% and 1.8% respectively.

The Sleep/awake habits characteristics among students in different educational levels was shown in Table 1. There was a significant difference among the students in the 2nd year (19%) and other students in 3rd year & students in clinical years (4.3%) & (9.5%) respectively in going bed less than 22 o'clock, also between students in the 3rd year (68.1%) and other students in 2nd year & students in clinical years (58 %) & (61.2 %) respectively in going bed more than 24 o'clock. But no significant difference was found among all students in the in going bed from 22 to 24 o'clock.

Another significant difference was found between students in the 2nd year (78%) and other students in 3rd year (57.4%) & students in clinical years (45.7%) in getting up in the morning < 7 o'clock, but students in clinical years (54.3%) showed high significant difference compared to 2nd year (22%) & 3rd year (42.6%) in getting up in the morning > 7 o'clock.

Also Table 1 showed a significant difference between students in the 2nd year (12%) and other students in 3rd year (4.3%) & students in clinical years (2.6%) in taking day time naps from 5-10 minutes, but students in 3rd year (10.6%) showed significant difference compared to 2nd year (8%) & clinical years (3.4%) in taking day time naps from 10-30 minutes. While 2nd (24%) & 3rd (21.3%) year students took day time naps from 30-60 minutes compared to clinical years (10.3%). But clinical years (45.6%) students took daytime naps from 60-120 minutes which is more significant from students in 2nd (24%) & 3rd (21.3%) year.

On the other hand, no significant difference was found between all three groups of students participating in the study in answering the following questions about sleep pattern, first, how often do they go to bed later than usual per week, second, how often do they wake up due to noise per week, third, how often do they drink coffee late at night per week (Table 1).

Figure 2 showed the effect of BMI on the difficulty to initiate sleep. Normal weight students showed a significance difference that 50% of them had difficulty to initiate sleep, while under-weight students showed 6.6% followed by obese (17%) then over weight (26.4%). On the other hand, 49.1% of normal weight students did not have difficulty to initiate sleep, while obese students showed 7.5% followed by under-weight (14.2%) then over-weight (29.2%).

Table 2 did not show any significant differences between gender and parameters of insomnia such as difficulty in initiating sleep, wake up in the middle of nights and wake up early in the morning except in the time taken to fall asleep each night, there was a significant difference. High percent of female students fall in sleep after 5-10 minutes more than male students (18.6% Vs 10.5%) respectively and after 26-40 minutes (30.8% female Vs 19.3% male). On the other hand, high percent of male students fall in sleep after 11-25 minutes more than female (47.4% Vs 25.6%) respectively.

There was no significance difference between different educational levels and parameters of insomnia except in waking up in the middle of nights, there was a significant difference. In Table 2, the significance difference was shown between students in the clinical years waking up in middle of nights one time (47.4%) more than other students, high percent of 2nd year students waking up 5-7 times in middle of nights (12.0%) more than students. But 3rd year students were found to wake up >7 times in middle of nights (6.4%) which was more than other students.

Table 3 showed significant differences between gender and some parameters of parasomnia such as bad dreams, speaking during sleep, sleep & eating and snoring. On the other hand no significant difference was observed between gender versus sleep & walking and bruxism. The significance difference was shown between male and female students, as high percent of male students never or rarely had bad dreams (42.1%) compared with female students (28.2%), on the other hand, high percent of female students sometimes (29.5%) and very often (6.4%) had bad dreams when compared with male students (12.3% & 1.8% respectively).

Concerning speaking during sleep, there was significance difference, as male students rarely to speak during sleep (28.1%) VS female students (11.5%), while female students sometimes (9.0%) speak during sleep VS male students (3.5%) (Table 3). Concerning eating & sleep, there was significance difference, as female students never eat & sleep (91.7%) VS male students (78.9%), while male students rarely (14%) & sometimes (7%) eat & sleep VS female students (7.1% & 1.3%) respectively. While Snoring showed significance difference, as male students had tripled times snoring (36.8%) more than female students (11.5%) (Table 3).

There was no significance difference between parasomnia parameters and educational level except in sleep & walking, as 2nd year students 14.0% of them sometimes had walking during sleep compared to 3rd year (4.3%) and clinical year (0.9%) students. On the other hand, clinical year students 91.4% never showed this phenomena compared with 3rd year (85.1%) and 2nd year (80.0%) (Table 3).

Sleep/awake habits characteristics of students versus sleep satisfaction were shown in Table 5. Only significant difference was shown between students in the times to go bed later per week versus sleep satisfaction as 22.2% of students with perfect sleep satisfaction go bed later once per week compared to students with poor sleep satisfaction (2.6%). Also, high percentages of students (55.6%) with perfect sleep satisfaction go bed later 1-2 times per week compared to students with very poor sleep satisfaction (10.0%). On the other hand, high percentages of students (about 40.0%) with poor and very poor sleep satisfaction go bed later 3-5 or > 5 times per week compared to students with perfect sleep satisfaction (5- 11%). No significance difference was observed in other parameters about sleep/awake habits characteristics of students versus sleep satisfaction.

Insomnia stratified by demographic versus sleep self -perception (sleep satisfaction & sleeping pills) was shown in Table 5. Only significant difference was observed between students took sleeping pills (78.9%) and difficulty in initiating sleep compared to (46.4%) who did not take sleeping pills. About 77.8% of students having perfect sleep satisfaction and had no difficulty to initiate sleep (significant difference). Also, from the same students (33.3%) fall asleep after 5-10 minutes with perfect sleep satisfaction (significant difference).

Table 1:-Sleep/awake habits characteristics among students in different educational levels in Medical College, Hail University, KSA. (n=213)

Sleep pattern	2 nd Year n (%)	3 rd Year n (%)	4 th 5 th 6 th Year n (%)	P- value
1. When do you usually go to bed at night? < 22 22–24 ≥ 24	9 (19.0) 12 (24.0) 29 (58.0)	2 (4.3) 13 (27.7) 32 (68.1)	11(9.5) 34 (29.3) 71 (61.2)	*S 0.001
2- When do you usually get up in the morning? < 7 ≥ 7	39 (78) 11 (22.0)	28 (59.6) 19 (40.4)	53 (45.7) 63 (54.3)	*S 0.001
3- How often do you go to bed later than usual? (per week) Never <One 1–3 times 3–5 ≥ 5	2 (4.0) 5 (10.0) 19 (38.0) 13 (26.0) 11 (22.0)	3 (6.4) 4 (8.5) 15 (31.9) 10 (21.3) 15 (31.9)	3(2.6) 14 (12.1) 45 (38.8) 35 (30.2) 19 (16.4)	NS 0.068
4- What is the duration of your daytime naps? (minute)				*S 0.029

5-10	6 (12.0)	2 (4.3)	3 (2.6)	
10-30	4 (8.0)	5 (10.6)	4 (3.4)	
30-60	12 (24.0)	10 (21.3)	12 (10.3)	
60-120	12 (24.0)	10 (21.3)	54 (45.6)	
>120	16 (32.0)	20 (42.6)	42 (36.2)	
5- How often do you wake up due to noise? (per week)				
Never	17 (34.0)	12 (25.5)	29 (25.0)	NS 0.713
<One	12 (24.0)	13 (27.7)	32 (27.6)	
1-2 times	16 (32.0)	13 (27.7)	39 (33.6)	
3-5	3 (6.0)	7 (14.9)	8 (6.9)	
≥ 5	2 (4.0)	26 (4.3)	8 (6.9)	
6- How often do you drink coffee late at night? (per week)				
Never	9 (18.0)	16 (34.0)	23 (19.8)	NS 0.207
<One	14 (28.0)	9 (19.1)	31 (26.7)	
1-2 times	11 (22.0)	11 (23.4)	30 (25.7)	
3-5	7 (14.0)	4 (8.5)	24 (20.7)	
≥ 5	9 (18.0)	7 (14.9)	8 (6.9) S	

- NS no significance difference at ($P < 0.05$)

- *S significance difference at ($P < 0.05$)

- Number of students without parenthesis

- Percentage of students in parenthesis

Table 2:-Insomnia stratified by demographic and lifestyle characteristics compared between gender and different educational levels in Medical College, Hail University, KSA. (n=213)

Characteristic	Gender		P- value	Educational level			P- value
	Male n (%)	Female n (%)		2 nd year	3 rd year	4 th -6 th year	
1- Difficulty in initiating sleep							
Yes	27 (47.4)	78 (50.0)	NS 0.734	25 (50.0)	20 (42.6)	62 (53.4)	NS 0.369
No	30 (52.6)	78 (50.0)		25 (50.0)	27 (57.4)	54 (46.6)	
2- Wake up in the middle of nights							
Never	17 (29.8)	46 (29.5)	NS 0.830	16 (32.0)	14 (29.8)	32 (27.6)	*S 0.048
One	26 (45.6)	64 (41.0)		18 (36.0)	17 (36.2)	55 (47.4)	
2-4 times	11 (19.3)	37 (23.7)		9 (18.0)	13 (27.7)	24 (20.7)	
5-7 times	1 (1.8)	6 (3.8)		6 (12.0)	0 (0.0)	4 (3.4)	
> 7 times	2 (3.5)	3 (1.9)		1 (2.0)	3 (6.4)	1 (0.8)	
3- Wake up early in the morning							
Yes	32 (56.1)	94 (60.3)	NS 0.756	33 (66.0)	28 (57.4)	66 (56.9)	NS 0.548
No	25 (43.9)	62 (39.7)		17 (34.0)	19 (42.6)	50 (43.1)	
4- How long (in min) has it usually taken to fall asleep each night?							
5-10 min	6 (10.5)	29 (18.6)	*S 0.04	8 (16.0)	8 (17.0)	18 (16.4)	NS 0.513
11-25 min	27 (47.4)	40 (25.6)		17 (34.0)	16 (34.1)	32 (28.4)	
26-40 min	11 (19.3)	48 (30.8)		9 (18.0)	15 (31.9)	34 (28.4)	
41-60 min	7 (12.3)	20 (12.8)		6 (12.0)	5 (10.6)	18 (14.6)	
>60 min	6 (10.5)	19 (12.2)		10 (20.0)	3 (6.4)	14 (11.2)	

- NS no significance difference at ($P < 0.05$)

- *S significance difference at ($P < 0.05$)
- Number of students without parenthesis
- Percentage of students in parenthesis

Table 3:-Parasomnia stratified by demographic and lifestyle characteristics compared between gender and all educational levels in Medical College, Hail University, KSA. (n=213)

Characteristic	Gender		P-value	Educational level			P-value
	Male n (%)	Female n (%)		2 nd year	3 rd year	4 th -6 th year	
1-Bad Dreams							
Never	24 (42.1)	44 (28.2)	*S 0.040	17 (34.0)	13 (27.7)	42(36.2)	NS 0.189
Rarely	24 (42.1)	53 (34.0)		16 (32.0)	22 (46.8)	40 (34.5)	
Sometimes	7 (12.3)	46 (29.5)		11 (22.0)	8 (17.0)	30 (25.9)	
Very often	1 (1.8)	10 (6.4)		3 (6.0)	3 (6.4)	4 (3.4)	
Every nights	1 (1.8)	3 (1.9)		3 (6.0)	1 (2.1)	0 (0.0)	
2-Sleep and speaking							
Never			*S 0.022				NS 0.233
Rarely	38 (66.7)	122 (78.2)		35 (70.0)	30 (63.8)	95 (81.9)	
Sometimes	16 (28.1)	18 (11.5)		9 (18.0)	10 (21.3)	13 (11.2)	
Very often	2 (3.5)	14 (9.0)		4 (8.0)	6 (12.8)	7 (6.0)	
	1 (1.8)	2 (1.3)		2 (4.0)	1 (2.1)	1 (0.8)	
3-Sleep and Walking							
Never			NS 0.087				*S 0.014
Rarely	45 (78.9)	143 (91.7)		40 (80.0)	40 (85.1)	106 (91.4)	
Sometimes	6 (10.5)	7 (4.5)		2(4.0)	3 (6.4)	8 (6.9)	
Very often	4 (7.0)	4 (2.6)		7 (14.0)	2 (4.3)	1 (0.9)	
	2 (3.5)	2 (1.3)		1 (2.0)	2 (4.3)	1 (0.9)	
4-Sleep and Eating							
Never	45 (78.9)	143 (91.7)	*S 0.019	44 (88.0)	37 (78.7)	107 (92.2)	*S 0.031
Rarely	8 (14.0)	11 (7.1)		4 (8.0)	6 (12.8)	9 (7.8)	
Sometimes	4 (7.0)	2 (1.3)		2 (4.0)	4 (8.5)	0 (0.0)	
5-Bruxism							
Never	46 (80.7)	129 (82.7)	NS 0.344	39 (78.0)	38 (80.9)	99 (85.3)	NS 0.250
Rarely	5 (8.8)	12 (7.7)		3 (6.0)	2 (4.3)	12 (10.3)	
Sometimes	6 (10.5)	8 (5.2)		6 (12.0)	5 (10.6)	3 (2.6)	
Very often	0 (0.0)	6 (3.8)		2 (4.0)	2 (4.3)	2 (1.7)	
Every nights	0 (0.0)	1 (0.6)		0 (0.0)	0 (0.0)	1 (0.9)	
6- Snoring							
Yes	21 (36.8)	18 (11.5)	*S 0.000	13 (26.0)	10 (21.3)	17 (14.7)	NS 0.202
No	36 (63.2)	138 (88.5)		37 (74.0)	37 (78.7)	99 (85.3)	

- NS no significance difference at ($P < 0.05$)
- *S significance difference at ($P < 0.05$)
- Number of students without parenthesis
- Percentage of students in parenthesis

Table 4:-Sleep/awake habits characteristics of students versus sleep satisfaction. (n=213)

Sleep pattern	Perfect n (%)	Good n (%)	Fair n (%)	Poor n (%)	Very Poor n (%)	P- value
1. When do you usually go to bed at night?						
< 22	4 (22.2)	8 (12.1)	5 (7.0)	2 (5.3)	2 (10.0)	NS 0.264
22-24	7 (38.9)	15 (22.7)	23 (32.4)	12 (31.6)	3 (15.0)	
≥ 24	7 (38.9)	43 (65.2)	43 (60.6)	24 (63.1)	15 (75.0)	
2- When do you usually get up in the morning?						
	11 (61.1)	39 (59.1)	36 (50.7)	22 (57.9)	12(60.0)	NS 0.839

< 7 ≥ 7	7 (38.9)	27 (40.9)	35 (49.3)	16 (42.1)	8 (40.0)	
3- How often do you go to bed later than usual? (per week) Never <One 1-2 times 3-5 ≥ 5	1 (5.6) 4 (22.2) 10 (55.6) 1 (5.6) 2 (11.1)	4 (6.1) 10 (15.2) 29 (43.9) 11 (16.7) 12 (18.2)	0 (0.0) 4 (5.6) 25 (35.2) 26 (36.6) 16 (22.5)	2 (5.2) 1 (2.6) 13 (34.2) 15 (39.5) 7 (18.4)	1 (5.0) 4 (20.0) 2 (10.0) 5 (25.0) 8 (40.0)	*S 0.005
4- What is the duration of your daytime naps? (minute) 5-10 10-30 30-60 60-120 >120	4 (22.2) 3 (16.7) 1 (5.6) 6 (33.3) 4 (22.2)	6 (9.1) 5 (10.6) 10 (15.2) 23 (34.8) 22 (33.3)	4 (5.6) 6 (8.5) 9 (12.7) 23 (32.4) 29 (40.8)	5 (13.2) 4 (10.5) 5 (13.2) 8 (21.1) 16 (42.1)	1 (5.0) 0 (0.0) 4 (20.0) 8 (40.0) 7 (35.0)	NS 0.590
5- How often do you wake up due to noise? (per week) Never <One 1-2 times 3-5 ≥ 5	5 (27.8) 8 (44.4) 5 (27.8) 0 (0.0) 0 (0.0)	24 (36.4) 19 (28.8) 16 (24.2) 6 (9.1) 1 (1.5)	15 (21.1) 16 (22.5) 26 (36.6) 9 (12.7) 5 (7.0)	10 (26.3) 9 (23.7) 13 (34.2) 3 (7.9) 3 (7.9)	4 (20.0) 5 (25.0) 7 (33.6) 1 (5.0) 3 (15.0)	NS 0.324
6- How often do you drink coffee late at night? (per week) Never <One 1-2 times 3-5 ≥ 5	6 (33.3) 7 (38.9) 2 (11.1) 3 (8.0) 0 (0.0)	18 (27.3) 18 (27.3) 17 (25.8) 6 (9.1) 7 (10.6)	13 (18.3) 15 (21.1) 15 (21.1) 18 (25.4) 10 (14.1)	8 (21.1) 13 (34.2) 8 (21.1) 7 (18.4) 2 (5.2)	3 (15.0) 3 (15.0) 8 (40.0) 1 (5.0) 5 (25.0)	NS 0.075

- NS no significance difference at ($P < 0.05$)

- *S significance difference at ($P < 0.05$)

- Number of students without parenthesis

- Percentage of students in parenthesis

Table 5:-Insomnia stratified by demographic versus sleep self -perception (sleep satisfaction & sleeping pills) (n=213)

Characteristic	Sleeping Pills			Sleep Satisfaction					
	Yes n (%)	No n (%)	P- value	Perfect n (%)	Good n (%)	Fair n (%)	Poor n (%)	Very Poor n (%)	P- value
1- Difficulty in initiating sleep Yes No	15 (78.9) 4 (21.1)	90 (46.4) 104 (53.6)	S 0.007	4 (22.2) 14 (77.8)	25 (37.9) 41 (62.1)	46 (64.8) 25 (35.2)	21 (55.3) 17 (44.7)	9 (45.0) 11 (55.0)	*S 0.003
2- Wake up in the middle of nights Never One 2-4 times 5-7 times > 7 times	2 (10.5) 8 (42.1) 6 (31.6) 2 (10.5) 1 (5.3)	62 (32.0) 82 (42.3) 41 (21.1) 5 (2.6) 4 (2.1)	NS 0.108	7 (38.9) 6 (33.3) 4 (22.2) 1 (5.6) 0 (0.0)	21 (31.8) 33 (50.0) 11 (16.7) 0 (0.0) 1 (1.5)	19 (26.8) 29 (40.8) 21 (29.6) 1 (1.4) 1 (1.4)	9 (23.7) 17 (44.7) 8 (21.1) 3 (7.9) 1 (2.6)	8 (40.0) 5 (25.0) 3 (15.0) 2 (10.0) 2 (10.0)	NS 0.137
3- Wake up early in			NS						NS

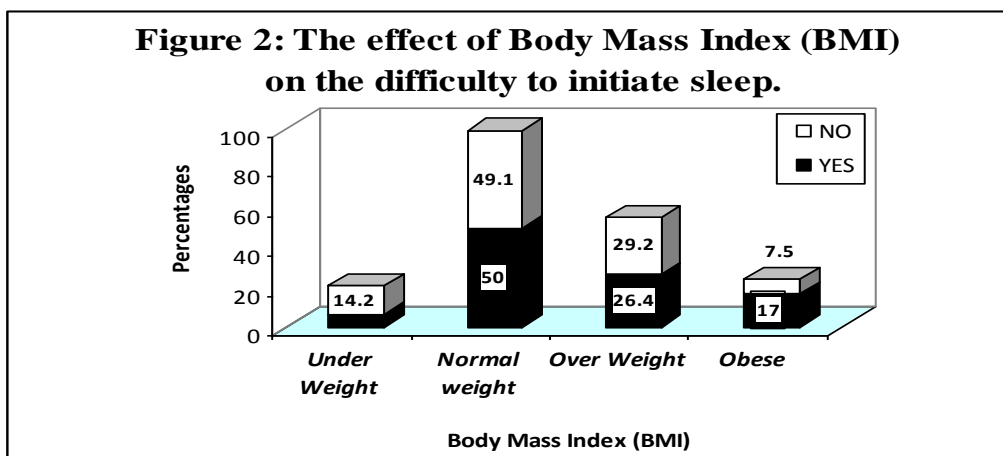
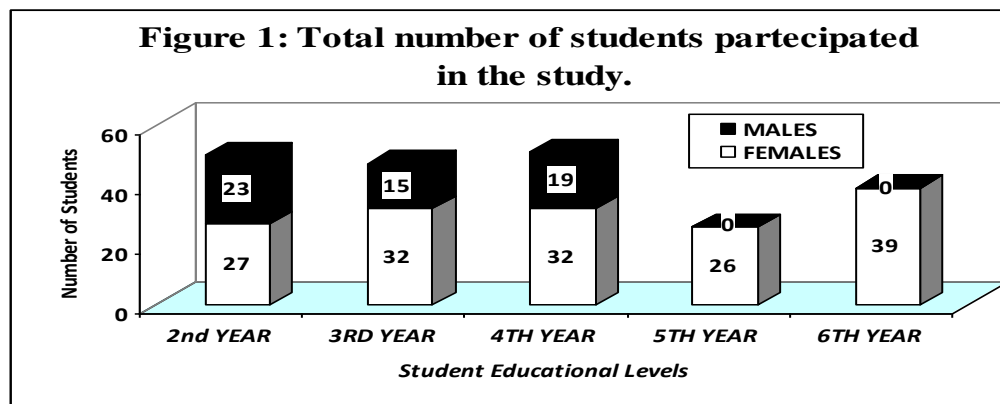
the morning Yes No	12 (63.2) 7 (36.8)	114 (58.8) 80 (41.2)	0.710	12 (66.7) 6 (33.3)	45 (68.2) 21 (31.8)	37 (52.1) 34 (47.9)	22 (57.9) 16 (42.1)	10 (50.0) 10 (50.0)	0.306
4- How long (in min) has it usually taken to fall asleep each night? 5-10 min 11-25 min 26-40 min 41-60 min >60 min	0 (0.0) 8 (42.1) 6 (31.6) 3 (15.8) 2 (10.5)	34 (17.5) 57 (29.4) 52 (26.8) 26 (13.4) 25 (12.9)	NS 0.338	6 (33.3) 5 (27.8) 4 (22.2) 2 (11.1) 1 (5.6)	13 (19.7) 25 (53.0) 18 (27.3) 6 (9.1) 4 (6.1)	7 (9.9) 16 (22.5) 21 (29.6) 12 (16.9) 15 (21.1)	5 (13.2) 14 (36.8) 11 (28.9) 7 (18.4) 1 (2.6)	3 (15.0) 5 (25.0) 4 (20.0) 2 (10.0) 6 (30.0)	*S 0.039

- NS no significance difference at ($P < 0.05$)

- S * significance difference at ($P < 0.05$)

- Number of students without parenthesis

- Percentage of students in parenthesis



Discussion:-

In this study, the sleep pattern of the medical students, 2nd year students were found to go to bed earlier than the other students from the 3rd year to 6th year. In a previous study of Nojomi et al. (2009) found that majority of participants usually went to bed between 22 & 24 o'clock (particularly among pre-internship group).

Also, a significant difference was showed, as 2nd year students got up earlier than the other students, but **Nojomi et al. (2009)** found that most of the participants got up at or before 7 o'clock in the morning (specially, among residents).

We found no significant between the participants in how often they go to bed later than usual per week, this study agreed with **Nojomi et al. (2009)**. Online survey demonstrated that first year college students went bed later than other students, but only on weekends (**Lund et al., 2010**) and during weekdays and weekends (**Trockel et al., 2000**). Experimental studies have demonstrated that a shift in bedtime by two hours while maintaining the same sleep duration resulted in increased feelings of depression, difficulty in concentration and mood changes (**Wolfson & Carskadon, 2003**).

Current study showed a significant contrast between duration of daytime naps among students. The 3rd year students took longer nap duration than the other students from different years. Also, **Nojomi et al. (2009)** showed that the majority of subjects had 60 to 120 min daytime naps (specially, among pre-internship). Online survey demonstrated that Students who reported cell phone awakenings also reported spending less time in bed and more time napping during the day (**Lund et al., 2010**).

From our study it was found that there is no significant between students in all educational levels and noise. On the other hand, **Forquer et al. (2008)** found that nearly 75% of students reported waking up nightly due to hearing noise. Also, **Jain & Sandeep (2016)** reported that 11% complaint of noise around bedrooms. **Levin & Fireman (2008)** and **Brown et al. (2002)** stated that noise around the sleep area is one of the common causes for sleep disorder.

In the current study, we concluded that there is no significant between students in all three groups and drink coffee late at night. On the other hand, **Nojomi et al. (2009)** showed that medical residents got an average amount of coffee (1-5 times per week) more than others.

In the insomnia parameters the female students were significantly found to take more time to fall asleep each night than male students, this result was in keeping with the study of **Nojomi et al. (2009)**, **Welstein et al. (1983)** and **Mellinger et al. (1985)**. In another study, females reported significantly higher prevalence of poor sleep quality (73.8%) compared to males (64.6%) (**Ibrahim et al., 2017**).

This study did not show any significant differences between Educational levels and parameters of insomnia except the 3rd year students were found to wake up in the middle of nights more often compared to the other medical students. The educational year of student was the second predictor; students enrolled in the basic medical years were about twice more likely to be poor sleepers compared to those in the clinical years (**Ibrahim et al., 2017**). The mean score of insomnia and parasomnia were a little bit higher in medical residents compared to medical student (but not significant) (**Nojomi et al., 2009**).

The present study did not show any significant differences between gender and parameters of insomnia when compared with different education levels. According to (**Nojomi et al., 2009**) they found a significant difference among residents who got up before 7 o'clock. Other study found that women had greater sleep difficulties than men, and that freshmen had shorter sleep than older students (**Tsai and Li, 2004**).

This study showed a significant correlation in one of the insomnia parameter (difficulty to initiate sleep) and BMI but not with parasomnia parameters, demographics characteristics, Sleep/awake habits. On the other hand, **Nojomi et al., (2009)** showed a significant correlation between BMI and parameters of parasomnia, but not for insomnia. Meanwhile, this study and **Nojomi et al. (2009)** didn't show any significant difference between BMI and self-perception of sleep quality. **Veldi et al. (2005)** showed relation of BMI to snoring and daytime sleepiness.

In our study, female students had bad dreams when compared with male students. Also, we found that 3rd year students showed significance difference in sleepwalking (very often) than 2nd year students and clinical years students. This result coincides with results of the India study which said among various sleep disorders, commonly seen was Insomnia, Narcolepsy, Sleepwalking, Obstructive Sleep Apnea, Circadian Rhythm Disorders, and Nightmares (**Jain and Sandeep Verma, 2016**).

In the present study, females were more poor sleepers compared to males, which agree with many previous studies (**Mesquita et al., 2010, Fawzy et al., 2017 and Yang et al., 2003**). In this current research, snoring was much higher in male than female which was agree with the study of **Lamberti (2012)**, they found that 30% reported snoring with a higher prevalence among men (42%) than women (25%).

This study did not show significant difference between sleep satisfaction and drinking coffee (data not showed). This finding was not agreed with other studies (**Ibrahim et al., 2017**) who found that consumption of caffeinated beverages was associated with poor sleep quality depending upon one's tolerance and sensitivity to caffeine. Also, **Sanchez et al. (2013)** was found that the consumption of caffeinated beverages was a risk factor of poor sleep quality, and others found that even one cup of coffee could disrupt an individual's sleep (**Nehlig et al. 1992**).

In the current study insomnia score was not related to poor sleep quality. on the other hand, study held on Abha, Saudi arabia to identify the predictors of poor sleep among medical students in King Khalid University (KKU) was found that Students going to sleep late (after midnight) were more likely to have poor sleep quality, compared to those who did not go to sleep late (**Siddiqui et al., 2016**).

Our result showed that wake up early in morning was not parameter of poor sleep. While **Ibrahim et al. (2017)** showed that students who went to sleep after 24 o'clock and got up early in the morning was unable to concentrate in their classes, and suffering from fatigue, anxiety and depression.

In present study there is a differences in choose timing of sleep behaviorr also have a worthy impact on the quality of sleep a student receives and their academic performances and presence. Also, demonstrates significant relationship between sleep satisfaction and going to bed late > 5 times per week. It also was found in a study by **Giannotti et al. (2002)** and **Wolfson & Carskadon (2003)** the students who preferred going to sleep later and waking up later had more sleep disorders, more daytime sleepiness, fell asleep in class more often and had poor academic performance. **Lamberti (2012)** showed that good sleepers got up in the morning and went bed earlier than did poor sleepers.

In this research the sleep satisfaction was not associated with wake up due to increase noise. But **Matsumoto et al. (2017)** found that noise was the strongest risk factor of sleep quantity. **Muzet (2007)** also said noise louder than 40 dB during sleep can activate autonomic responses and increase cortisol levels on wake-up, thus leading to excessive daytime fatigue, sleepiness, and declining performance. In addition, at around 5 h after sleep onset, sleep is typically in the shallow stages (stage 1–2), which means that people are awoken more easily by noise and their sleep duration is thus cut short. Furthermore, these physical responses did not adapt to chronic exposure to noise, whereas subjective sleep satisfaction can.

The current study showed that students who have difficulty in initiating sleep consumed sleep pills. This finding is similar to previous study of **Siddiqui et al. (2016)** where the students using medicine to aid sleep had significantly poorer sleep quality scores compared to the students who did not use medication.

In their survey of four universities in Karachi, Pakistan, found a high prevalence of self-medication by students (**Zafar et al., 2008**), more than 7.6% of their participants reported insomnia as a reason for self-medication, and 10% participants admitted to the misuse of sleeping pills.

Concerning insomnia problems compared to self-perceptions (sleep satisfaction), 77.8% of students who had perfect sleep satisfaction did not have difficulty in initiating sleep. Also, from the same students (33.3%) fall in sleep directly after 5-10 minutes which is an indicator of perfect sleep satisfaction. **Nojomi et al. (2009)** found an association between self-perception (sleep satisfaction) and insomnia where students with "poor" or "very poor" sleep consumed sleeping pills more frequently than others.

Conclusion:-

Sleep disturbances are an important issue among medical students as a result of academic stressors and workload. Students with perfect sleep satisfaction had no difficulty to initiate sleep. The students who have difficulty in initiating sleep, consumed sleep pills. Females were more poor sleepers compared to males and no correlation between sleep satisfaction and drinking coffee.

Recommendation:-

Because of the high prevalence of poor sleep quality among medical students, medical colleges need to establish sleep educational program to help their students identify their sleep problems and further to solve these problem through the implementation of stress management courses and offering clinical consultations. Further researches are needed to study the effect of using phones on sleep hygiene and the correlation between the type of medical curriculum and the sleep pattern of medical students.

References:-

1. **Alsaggaf, M. A., Wali, S. O., Merdad, R. A., & Merdad, L. A.** (2016). Sleep quantity, quality, and insomnia symptoms of medical students during clinical years: Relationship with stress and academic performance. *Saudi Medical Journal*, 37(2), 173–182.
2. **Brown, F., Buboltz, W. C., Jr. and Soper, B.** (2002). Relationship of sleep hygiene awareness, sleep hygiene practices, and sleep quality in university students. *Behavioral Medicine*, 28(1), 33-38.
3. **Buyse, D.J., Reynolds, C.F., Monk, T.H., Berman, S.R. and Kupfer, D.J.** (1989). The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Research* 28, 193–213.
4. **Dyrbye LN, Maslach MR, Shanafelt TD.** (2006). Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med*; 81: 354-373.
5. **Fawzy, M. and Hamed, S.A.** (2017) Prevalence of psychological stress, depression and anxiety among medical students in Egypt. *Psychiatry Res* 255: 186-194.
6. **Forquer, L., Camden, A., Gabriela, K. and Johnson, C.** (2008). Sleep patterns of college students at a public university. *Journal of American College Health*, 56(5), 563-565.
7. **Giannotti, F., Cortesi, F., Sebastiani, T., and Ottaviano, S.** (2002). Circadian preference, sleep and daytime behaviour in adolescence. *Journal of Sleep Research*, 11(3), 191–199.
8. **Harrison Y, Horne JA.** (2000). The impact of sleep deprivation on decision making: a review. *J Exp Psychol Appl.*; 6: 236 – 249.
9. **Ibrahim, N.K., Badawi, F.A., Mansouri, Y.M., Ainousa, A.M Jamb SK, Fatani, A.N. and Andijani, R.A.** (2017) Sleep Quality among Medical Students at King Abdulaziz University: A Cross-sectional Study. *J Community Med Health Educ* 7: 561.
10. **Jain, A. and Sandeep Verma, S.** (2016). Prevalence of sleep disorders among college students: A clinical study. *J Adv Med Dent Scie Res*; 4(6):103-106.
11. **Lamberti, M.K.** (2012). "Improving Sleep in College Students: An Educational Intervention". Doctoral Dissertations. Paper AAI3520443
12. **Levin, R. and Fireman, G.** (2002). Nightmare prevalence, nightmare distress, and self-reported psychological disturbance. *Sleep*; 25(2): 205–212.
13. **Lund, H. G., Reider, B. D., Whiting, A. B. and Prichard, J.** (2010). Sleep patterns and predictors of disturbed sleep in a large population of college students. *Journal of Adolescent Health*, 46(2), 124-132.
14. **Matsumoto, Y., Uchimura, N., Ishida, T., and Morimatsu, Y.** (2017). The relationship of sleep complaints risk factors with sleep phase, quality, and quantity in Japanese workers. *Sleep and Biological Rhythms*, 15(4), 291–297.
15. **Mellinger, G.D., Balter, M.B. and Uhlenhuth, E.H.** (1985) Insomnia and its treatment. Prevalence and correlates. *Arch Gen Psychiatry*, 42: 225 – 232.
16. **Mesquita, G. and Reimão, R.** (2010) Quality of sleep among university students: Effects of nighttime computer and television use. *Arq Neuropsiquiatr* 68:720-725.
17. **Muzet, A.** (2007) Environmental noise, sleep and health. *Sleep Med Rev*, 11(2):135–42.
18. **Nehlig, A., Daval, J. and Derby, G.** (1992). Caffeine and the central nervous system: Mechanisms of action, biochemical, metabolic, and psychostimulant effects. *Brain Research Review*, 17(2), 139-170.
19. **Nojomi, M., Ghalhe Bandi, M. F. and Kaffashi, S.** (2009). Sleep pattern in medical students and residents. *Archives of Iranian Medicine*, 12(6), 542–549.
20. **Pagnin D, de Queiroz V, Carvalho YT, Dutra AS, Amaral MB, Queiroz TT.** (2014). The relation between burnout and sleep disorders in medical students. *Acad Psychiatry*; 38: 438-444.
21. **Pilcher JJ, Huffcutt AI.** (1996). Effects of sleep deprivation on performance: a meta-analysis. *Sleep.*; 19: 318 – 326.
22. **Sanchez, S.E., Martinez, C., Oriol, R.A., Yanez, D., Castañeda, B., Sanchez, E., Gelaye, B. and Williams, M. A.** (2013) Sleep quality, sleep patterns and consumption of energy drinks and other caffeinated beverages among peruvian college students. *Health* 5(8B), 26-35.

23. **Shah M, Hasan S, Malik S, Sreeramareddy CT.** (2010). Perceived stress, sources and severity of stress among medical undergraduates in a Pakistani medical school. *BMC Med Educ.* Jan 15;10:2.
24. **Siddiqui, A.F., Al-Musa, H., Al-Amri, H., Al-Qahtani, A., Al-Shahrani, M. and Al-Qahtani, M.** (2016) Sleep patterns and predictors of poor sleep quality among medical students in King Khalid University, Saudi Arabia. *Malays J Med Sci: MJMS*, 23(6):94–102.
25. **Trockel, M.T., Barnes, M.D. and Egget, D.L.** (2000). Health-related variables and academic performance among first-year college students: implications for sleep and other behaviors. *Journal of American college health: J of ACH*, 49(3):125–131.
26. **Tsai, L. and Li, S.** (2004). Sleep patterns in college students: Gender and grade differences. *Journal of Psychosomatic Research*, 56(2), 231-237.
27. **Veldi, M., Aluoja, A. and Vasar, V.** (2005) Sleep quality and more common sleep-related problems in medical students. *Sleep Med*, 6: 269 – 275.
28. **Waqas A, Khan S, Sharif W, Khalid U, Ali A.** (2015). Association of academic stress with sleeping difficulties in medical students of a Pakistani medical school: a cross sectional survey. *PeerJ* 3:e840
29. **Welstein, L., Dement, W.C., Redington, D., Guilleminault, C. and Mitler, M.M.** (1983) Insomnia in the San Francisco by Area: a Telephone Survey. In: Guilleminault C, Lugaresi E, eds. *Sleep/Wake Disorders: Natural History, Epidemiology, and Long-Term Evaluation*. Raven Press: New York, 73-85.
30. **Wolfson, A.R. and Carskadon, M.A.** (2003). Understanding adolescents' sleep patterns and school performance: a critical appraisal. *Sleep medicine reviews*; 7(6):491–506.
31. **Yang, C.M., Wu, C.H., Hsieh, M.H., Liu, M.H., Lu and F.H.** (2003). Coping with sleep disturbances among young adults: a survey of first-year college students in Taiwan. *Behavioral Medicine* 29, 133–138.
32. **Zafar, S.N., Syed, R., Waqar, S., Zubairi, A.J. and Vaqar, T.** (2008) Self-medication amongst university students of Karachi : prevalence , knowledge and attitudes. *J Pakistan Med Assoc*, 58(4):214–7.